

RESEARCH DESIGN ISSUES FOR
THE BRITISH PANEL STUDY

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Working Paper 1 Research Design Issues

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Introduction

This report sets out some of the major research design issues concerning the panel study, and is intended to give an overview of the sorts of problems we need to be aware of during the planning phase, fieldwork phase and in the longer term.

Many of the problems addressed have warranted an extensive literature review of research design of various longitudinal and panel studies throughout Europe and the U.S.A., of the major British multi-purpose cross-sectional surveys, focussing on validation and enumeration studies, and on responses from analysis of longitudinal data.

Apart from the problems which confront all types of surveys, latitudinal and longitudinal, many of the problems which are specific to a panel study are highly complex and technical and somewhat enigmatic. Some of these areas will be discussed, but it will be necessary to consult people who have experience in the analysis of panel data, who are familiar with the new developments in statistical modelling techniques.

Some of the most relevant issues reviewed and discussed are;

- Sampling frames
- Sampling methods
- Sampling sub populations/over-sampling
- Response rates
- Interviewer qualities/motivation
- Attrition
- Motivation and maintaining a panel
- Use of incentives
- Non-response and missing data
- Research instruments; face-to-face interviews, self-completion questionnaires, telephone interviewing
- Quality and reliability of panel data
- Panel conditioning
- Proxy data
- The use of questions from other studies
- Measurement errors
- Definitions of households/ families
- Defining non-sample panel members
- Identification system
- Data management and storage
- Dissemination and user involvement
- Fieldwork agencies

To accommodate these requirements a relational data-base management system, i.e. "third normal form" rather than a record based organisation is necessary, in which measurement can be stored only for cases which are observed.

Missing data dealt with by imputation and editing (see earlier discussion) which creates 'synthetic' observations should be distinguished from observations i.e. stored in separate arrays from the 'real' data. Methods and valuation of the imputation procedure must also be documented.

For documentation specific to panel data, we require consistencies in conveyed meanings of the independent design, instrument and values of observation e.g. the meaning of the initial design which is a probability sample of the population in households at every point in time, but a subsequent wave design which is not a probability sample of individuals in the household population at two points if we do not follow all who move.

These sources of biographical description should be contained in an abstract. Also important is to index and integrate locational, spatial and environmental encoding with human geographical information, at the sub-national level.

The Census Bureau SIPP institution, the RESEARCH NETWORK AND DATA CENTRE was set up to deal with the above deficiencies of communication and provides; directory of users, node to receive info, data assistance & electronic linkage of users via telephone & BITNET. The system appears to be very comprehensive, and we are in the process of finding out more.

DISSEMINATION

Dissemination of information at a number of different levels should be as rapid as possible to;

- 1) government, industrial consortia and other involved parties.
- 2) sample members
- 3) various forms of media
- 4) Data Archive and outside the UK

Reports might take the form of cross-sectional annual reports on core information and periodic one-off reports on detailed topic modules, and longitudinal reports. The SIPP proposes longitudinal reports for example on;

- economic profiles using yearly aggregates of information on individuals
- comparative profiles e.g. annual comparisons of economic activity
- transition reports, i.e. change in income and benefit
- longitudinal family and unrelated profiles on individuals "shared experience"
- special event reports e.g. on marriage, divorce, birth, mobility, return to education etc.

The major surveys that have reviewed and which form the grounding for this working paper are;

GREAT BRITAIN

Census
GHS
FES
LFS
British Social Attitudes
NCDS
Family Formation Survey

NORTH AMERICA

Survey of Income Participation Program (SIPP), USA
Panel Study on Income Dynamics (PSID), USA
National Survey of Families and Households, USA
Canada Labour Force Survey
Making a Living - Canada

EUROPE

German Socio-economic Panel (GSEP)
Netherlands Socio-economic panel Survey
Irish Panel Study

NB. The only documentation for the Luxembourg Panel Socio-economique at present is in French. The forthcoming IRC visit to Luxembourg should yield interpretable information, which can then be reviewed.

In the interests of having a panel study which is compatible with some of the on going European and world wide studies, it seems of first priority to obtain first hand information from those running the surveys, and of any recent validations. Basing our design on a thriving and successful study(ies) but tailor made with respect to being specific to Britain, would seem an optimal position to aim for. However many of the similar socio-economic panels are in their early years and any longer term negative consequences cannot be forecasted. Clearly there is no benefit from parallelling a study, which yields a set of data which is beset with reliability and validity errors and of no use to the analyst of panel data.

In Appendix I is a review of the various panel studies. I can provide further overviews and details of research design of these studies, and have much of the relevant literature at hand, for anyone interested in following up references and specific areas. A comprehensive bibliography is also included at the end of the report.

SURVEY DESIGN IN THE MEASUREMENT OF SOCIAL CHANGE

A review of the literature on the subject of measuring social change, points to two definitional aspects of change; that of characteristics of the population and that of composition of the population i.e. entrants and leavers. Net change is measured at the aggregate level, whilst individual change may be measured according to the dynamic element, i.e. gross change at the elemental level (e.g. voting), average change from trends for the individual (e.g. growth in earnings) and instability (e.g. variance of monthly family income). Duncan and Kalton (1987) recognise four types of basic survey designs which are appropriate to the measurement of such dimensions;

A. Repeated measures - net change reflecting changing values and changing population composition. e.g. GHS.

B. Panel survey - net change reflecting changing values ONLY, and provides bounding for frequency and timing of events in a given time. e.g. PSID.

C. Rotating panel survey - comprising limited membership, but reducing conditioning and loss. The design picks up new entrants to the population and checks on biases from panel conditioning (see later discussion) and panel respondent losses (see attrition). Thus it provides cross-sectional estimates, estimates of trends, net change, and cumulates cases of static and stable characteristics. e.g. FES.

D. Split panel survey - comprising panel and rotating panel design. e.g. BSAS. Since longitudinal studies are only representative of the population as it was constituted initially, this type of design is most favourable, or at least combining the panel element with a cross-sectional or repeated measures design to (a) separate out the effects of aging, generational differences and historical and cultural change e.g. for health data to distinguish between incidence and prevalence of illness etc. and to take account of changing biological and social circumstances such as patterns of health care etc. and (b) to check and validate the panel data annually to account for any bias and conditioning. However in consideration of cost, the rotating element needs only to be a small sample in comparison to the major panel sample.

SAMPLING

Sampling Frames

The essential features we require of a sampling frame is that it includes;

- 1) up-to-date listing of population, which is complete and free from redundant or duplicate records
- 2) centrally available listing in a machine readable form, to enable automated selection procedure.
- 3) use of clustered multi-stage sampling for cost purposes and
- 4) stratification information which must be readily available i.e. geographic, socio-economic.

These four criteria present a number of potential problems for a panel study. Points 3) and 4) in particular which are discussed after a review of the national sampling frames available in the UK. They are in practice limited to a choice of four;

- A. Electoral Register
- B. Rating Valuation Lists
- C. Postcode Address File
- D. Census of population

Some of the advantages and disadvantages of the sampling frames available are outlined below.

A. Electoral Register

Addresses are listed for Local Authorities (LA), electoral wards and polling districts for those eligible to vote and are updated annually. Advantages are that census information is available down to the ward level thus allowing stratification by geographic and socio-economic factors. Since all adults are listed at addresses selection by probability proportional to size is enabled avoiding the process of re-weighting the sample. The Electoral Register (ER) is also useful for sampling ethnic minorities from names, and for gender subgroups. Disadvantages however are that the ER is rapidly out of date for sampling purposes, being compiled 6-18 months before release, excluding new inhabitants and some movers. Obviously those who are non registered are omitted, which constituted approx 4% in 1981, in particular recent movers, those under age 24, New Commonwealth Citizens and those not entitled to vote, and Inner London population.

B. Rating Valuation Lists

These are lists of properties compiled by Local Authorities and are advantageous in that they distinguish between domestic and commercial/industrial properties. They are more complete than the ER or PAF (see below), and have better coverage especially for housing units. However they are not immediately available and are compiled in a non standardized way by LAs, thus selection is restricted to contact by interviewers, a costly method.

C. Postcode Address File (PAF)

This appears to be the best available and is used by OPCS. It lists every postal delivery point in a hierarchical structure within postcodes. Advantages are economical in that it is centrally available and machine-readable allowing computerised selection of delivery points and printing out of addresses locally. There are two listings available, business and small users (PAF), the latter consisting of addresses with less than 25 items of mail per day. The file is up-to-date and has complete coverage, estimated at 98% of addresses in the UK.

Problems include the fact that the PAF includes non-residential addresses, approx 11% which are not evenly spread over areas, resulting in extra fieldwork costs and increased sampling errors because of the reduced effect of stratification and increased clustering effect. There is also no

indication of the number of individuals at addresses and no surnames available, making initial personalised introduction (something very important for a panel sample) difficult. However the higher non-response is counter-balanced by the more complete coverage, and enumeration shows that those who are likely to not register on the ER are hardest to contact anyway, thus non-response rates using the PAF may appear to be more biased than they are in reality. OPCS have a sampling frame stratified at postcode sector level and software linked to the PAF for correspondence with addresses.

Another disadvantage is that the PAF boundaries do not always coincide with Local Authority districts, thus must be arbitrarily assigned to a specific LA according to where the majority of delivery points fall. Lastly multiple occupancy (MO) is an added complication for PAF sampling, i.e. should we subsample within MO households? If so this inevitably incurs further sampling error, i.e. double clustering of within low density region and within addresses and households.

I have not researched the availability of the PAF and the accompanying software to users outside OPCS, but a company called Pinpoint Limited have developed a "Pinpoint Address Code" which consists of every address in the UK and for each a 12 figure National grid co-ordinate and full postcode. Its advantages are that it should provide a complete locational referencing system. This will be pursued in greater detail, but it is more than likely that the fee for use is fairly high.

D. Census of Population

Lastly the census which has the best coverage, over 99% of England and Wales, and which has the best socio-economic information at the small area level. It can also be used to form the basis of a sampling frame of institutions, approx 1% of the population. Its disadvantages are clear in that it is only a decennial survey and there is public concern over data usage. Obviously the 1991 release will not coincide with our fieldwork schedule, thus making it a non option.

STRATIFYING FACTORS

Taking point 4) above, many samples are commonly stratified by area, population density and by various socio-economic indicators, e.g. occupational SEG, percentage owner occupiers, rateable values and percentage unemployed. These factors must be questioned for their validity i.e. Registrar Generals SEG is used and housing tenure may be a less discriminating factor today, given the large scale purchase of council housing. I have not as yet come across any other economic indicators that are used for stratification purposes in the large UK surveys, nor any validation studies or research in this area. Thus it is probably desirable to address these issues. However we are limited in the choice we have for stratifying factors, since only the most basic are documented for the whole population.

Take an example, the Labour Force Survey, taking LA as PSU, stratifies their sample by three factors; London and metropolitan LAs, population density and smaller LAs. For the met. PSUs systematic random sampling is adequate, since

the population density avoids the necessity to cluster addresses. However for rural LAs two stage clustering is desirable; by postcode sectors as PSU with selection probability proportional to size (including combination of small adjacent PSUs) and secondly by selection of addresses from each sector by systematic random sampling. The LFS in its 'boost sample' additionally stratifies by proportion of economically active unemployed.

A final point facing sampling, recognised by OPCS in enumeration studies of UK surveys from the last census, is the relative difficulties in distinguishing between different types of address (Birch and Britton, 1986). Problematic types of household were second homes, holiday lettings, new vacancies, vacancies under improvement and other types. The same enumeration also suggested a 30% misclassification of number of rooms and a 25% misclassification of occupation. Here we must pay close attention to such issues by establishing guidelines for unambiguous and salient classification.

SAMPLING METHODS

In respect of the initial criteria set out above, point 3) above is particularly relevant since cluster sampling adds an added source of error in terms of design effects to the analysis of panel data. It appears that many dynamic models so far developed are not able to cope with such design effects, and such statistical techniques are currently being worked on. This is a technical area which is best left to a panel design working group to chew over.

However cluster sampling is to a greater extent unavoidable if we are to obtain cost efficiency in fieldwork and to be able to have enough cases to make local or regional comparisons of socio-economic and cultural circumstances. Keeping clustering stages to a minimum is desirable.

A report examining different methods for sampling PSUs in the GHS concluded that alternate systematic sampling is the most efficient and yields the lowest standard errors and variance of the 'between-PSU' component (OPCS 1984). The PSUs were in this case stratified and ranked according to percentage of owner occupiers.

COVERAGE AND OVER-SAMPLING

Our original proposal commits us to a nationally representative sample of approx 12,000 individuals. If Primary Sampling Units are to be selected with probability proportional to size the sample for Wales and Scotland will be relatively small. This has been brought to our attention by David Raffe, from the Centre for Educational Sociology, who strongly suggests that in order to yield reliable information for these sub populations we should oversample, particularly if we want to draw comparisons between England and Scotland on a number of sociological and policy aspects, and in the light of the future of the union.

Oversampling of other subpopulations is also a topic we are addressing. It is well documented that many sub populations have higher rates of attrition. Demographically ethnic minorities, and the elderly have lower response rates and higher attrition, and in terms of income and wealth, households at the top and bottom ends of the income scale and the self-employed similarly. For example the SIPP aims in future waves to initiate sampling sub populations of high and low income groups, blacks and hispanics, aged and disabled groups. Likewise the US National Survey of Families and Households uses a double sample of minorities, single-parent families, families with step-children, cohabiting couples and recently married couples. The decision to, and of whom, to oversample should be addressed at an early stage.

(i) Ethnic minorities

The German Socio-economic Panel uses two subsamples based on the nationality status of the 'head' of household. Sample 'A' includes those who are eligible to vote (i.e. not foreign) systematically selected from election voting districts, whilst sample 'B' consists of foreign 'heads' (non-voters) selected from a regional administrative registers assuming a response rate of 70% (Hanefeld 1984). Clearly in the UK defining areas of ethnic minority populations is far more complex. In respect of over sampling minority groups or those with low response rates, there are different sampling techniques available; NI insurance numbers, PAYE for income related populations and recently SCPR has investigated a method for sampling ethnic minority groups which is far more reliable than sampling from names from telephone directories, postal enumeration, electoral registers and snowballing (Brown & Ritchie 1981). Their method of focussed enumeration based on systematic sampling of households in an area, and then visiting the addresses to establish whether any people of Asian or West Indian origin live there or in a specified number of houses to the left or right of that address. This appears to be a valuable technique but could of course be a costly fieldwork exercise. However contacting SCPR at a later stage should shed more light on this.

Another potential difficulty in consideration of sampling ethnic minorities, though not so much for the UK compared to European countries, is language problems. The German panel study has a bilingual questionnaire available and uses an option of foreign 'translators' to accompany interviewers.

(ii) Institutionalised population

A recurring problem with national representativeness using available sampling frames is the exclusion of the population in institutions. It is therefore necessary to consider whether it is worth sampling such sub populations, for example students who are often not represented. A recent validation study carried out by OPCS, discusses a method for identifying and contacting students who are members of sampled households in the GHS (Gregory and Cardy, 1984). The majority of national surveys restrict their coverage to private households owing to the high cost of institutional sampling, although the elderly in homes are more accessible. For example the GSEP has a separate quota samples (since no sampling frame is available) for the elderly in homes and hostels, dorms excluding military, mental institutions and prisons. It is apparent that the time and cost of constructing separate relevant questions is not justified (Hanefeld, 1984).

NON-RESPONSE

With regard to panel studies, three types of non-response may be distinguished; non-contact, refusal to participate and the added complication of attrition.

(i) Initial contact

Recent UK research suggests that interviewer quality was the major determinant in success of initial contact. Interviewers who possess cars and are otherwise employed are more successful in establishing contact and eliciting commitment from potential respondents. Clearly initial refusals vary with the subject of the survey, but appear to be differential, e.g. the single elderly are less inclined to participate. However evidence suggests that it is circumstantial or 'situational' refusal rather than a 'hard-core' of refusers, thus here again the role of interviewer training and skill being of prime relevance (Collins, 1987).

(ii) Attrition

Attrition is the panel study's worst enemy. It has major implications at two levels; for design and analysis. Firstly it must enter into calculations at the level of initial research design, in allowing for differential attrition between sub-groups, and consequential need to oversample. Secondly in consideration of the fieldwork cost and effort required to track and maintain a panel. From an analysis point of view, the need to maintain a set of consistent panel data for each individual for studying relationships at the individual, family and household level is implicit, since the application of dynamic models is in question with 'inadequate data' i.e. imputed or weighted data for missing responses.

Many variables have been found to be discriminators of attrition. Reports from the PSID and BSAS, show that there is a relationship between participation and economic variables, income, age, race and geographic mobility (PSID 1984, Lievesley and Waterton 1985). However the UK data suggests that although the young and mobile are hard to recontact, and the under 25's and over 65's are underrepresented, these are not statistically significant attrition effects. Estimates from regression using the BSAS show a 2% fall in response for a 5 year increase in age. The BSAS findings on attrition for 3 years of their panel are summarised below;

Employment status:	retired, sick, students	mt	
Tenure:	local authority renters	ol	
Gross household income:	lower income	sl	
Age:	over 60's	tl	3/3 years
Political party ID:	non-aligned	l	
Household type:	pensioner households	al	
		tl	
Race:	non-white	tl	
Social class:	manual, unclassifiable	rl	2/3 years
		il	
Personal income:	lower income	tl	
Marital status:	widowed	il	1/3 years
Age Left F-T Education:	<15	ol	
		nl	

Non respondents were also more likely to answer don't know and have less 'liberal' attitudes on various items. They were also more likely to reside in inner London and Metropolitan Districts. Other studies report that the highest panel mortality occurs between the first and second waves.

These studies have major implications for how we develop a strategy for maintaining our panel. The following section sets out the sorts of methods and techniques other panel studies have utilised in an attempt to cope with attrition and maximise respondent motivation.

MOTIVATION AND MAINTAINING RESPONSE

a) **Interviewer morale:** Interaction is more unsuccessful when inflexible, time-pressed and rule-bound and therefore to gain maximum motivation from participants interviews must be well tailored to overcome any negative and dubious reaction. Flexibility is particularly relevant in some cases, e.g for questioning young people on sensitive issues it may be preferable to conduct the interview alone or at their choice of site. These issues also apply to initial contact above. Thus a requirement is a first class efficient, sympathetic and flexible interviewing team.

b) **Incentives:** Payments or gifts in the UK are not commonly used, but the FES for example since 1981 increased it's offer to a £5 payment per co-operating 'spender' in an attempt to counteract the declining response rate. It appears that odd increments serve no gain, although they intend to offer £10 from 1991, and more important is the effect of the this incentive coupled with the interviewer effect. The PSID panel are paid a nominal fee of \$12.50 and \$5 for returning address update notifications.

Other options are entry in a nationally reputable lottery, for example the German panel study uses a lottery incentive which they claim to successful. An Irish study showed people preferred a lottery incentive with the chance to win £500 over a nominal payment, the response rate remaining the same for both control groups (OPCS SSD). The pros of lottery tickets point to the cost in payment being drastically reduced over standard payment but this may be

counterbalanced by the large amount of administration and possible legal obstacles.

Other panel surveys have used other sorts of incentives; the Netherlands Socio-economic Survey who give a gift token, report a 14% higher initial response for a rewarded sample, and a 93% response for willing to participate a second time, compared with 84% who did not receive a gift.

Other methods of motivation again depend on the amount of investment by the the fieldwork team and the Panel Study, both prior to and after each wave of interviewing.

c) **Written communication:** Sending a booklet to respondents describing the study, the method of selection, importance and confidentiality, in good time before the fieldwork commences has been shown to gain good response (Hanefeld, 1984). The GSEP sends out a declaration concerning data protection giving relevant information with its initial letter. Negative responses can be pursued by sending more documentation, revisiting and telephoning. After each data collection sending a letter possibly with a gift, and a short attractively presented report of the study and announcement of next wave are means of enhancing motivation and gaining up-to-date addresses.

Statistics Canada attribute their high response rate of 95% for the Canada Labour Force Survey to their advance letter, persistent follow up and a regular monitoring and discussion of respondent losses with interviewers. However they have an added 'enforced' incentive, in that the Statistics Act is a legal requirement in Canada !

d) **Personalization:** This means of establishing co-operation employs a 'personalised' approach, such as a familiar distinctive logo on all communication, hand written envelopes (perhaps not entirely cost effective !) and questionnaire face sheets which familiarise the interviewer with the household circumstance beforehand. Good publicity is obviously one of the best sources of incentive and willingness to participate.

e) **Persistent tracing:** To attempt to overcome the problem of temporary non-response, making a sustained effort to recontact non-respondents in the year(s) following the non-response wave has been found to pay off, the SIPP claiming to re-capture 17% of their panel members who were missing on waves. Most panels however do not pursue this mode of tracking, but it is worth considering us following the example of the SIPP to obtain higher response rates. This topic is discussed further in the later section on tracking.

NON-RESPONSE AND MISSING DATA - IMPLICATIONS FOR ANALYSIS

One of the paramount criteria for a successful panel is ability to maintain high response through participant motivation and sustained interest. US evidence shows that panel non-response increases with successive waves (SIPP 1986) and thus techniques of imputation and weighting have to be employed. These methods have justified worthy attention specifically by analysts of longitudinal data who employ complex dynamic modelling.

Methods of checking for bias in later non-response take a number of forms (Duncan & Kalton 1987). Firstly it is relatively simple to compare distributions of answers from previous waves, but a better technique is to perform a regression on data from previous waves, including variables from subsequent response status and interactions between response status and key behavioural parameters.

Unit non-response i.e. occurring on any wave can be dealt with by weighting, whereas item non-response from units responding on all waves requires imputation. Imputation invariably involves the 'hot-deck' procedure, whereby a case with similar characteristics to the case with a missing value to be imputed is selected randomly and that value used. This of course depends on the definition of 'similar characteristics' and thus may incur bias. For interval level data, missing values are replaced by mean values or from estimates from a regression model (Payne 1972).

The problem arises when we consider wave non-response, as to which of the above techniques, if either, are suitable. On the one hand weighting ignores the possible continuity of responses on some items, but retains a full covariance structure for all items on the longitudinal record (different sets of weights must be assigned for each combination of waves analysed, depending on the type of non-response). Also weighting tends to discard much information since non-respondents on waves are omitted.

Imputation, on the other hand, retains the structure of only some respondent covariances. If variables are stable over time (mostly categorical) then missing waves can be well predicted from other wave values and imputation by a cross-wave "carry-over" procedure is adequate. However for continuous variables this method fails to track net changes over time and underestimates gross change, rendering longitudinal imputation a preferable technique. Other imputation techniques involve imputing for a percentage of wave non-respondents, but in general this technique is better for smaller subsamples.

Consequently what analysts are aiming to do, is to incorporate a model for non-response into estimation procedures, for example work on the SIPP proposes model-based imputations for missing responses patterns based on frequency distributions of response patterns (SIPP, 1986).

DATA COLLECTION

The BPS commitment to conduct face-to-face interviews with each eligible sample member for some 5000 households is an ambitious task, especially considering the proposed ten year life span for the panel. The reasons for paying attention to additional or alternative forms of data collection are twofold;

(i) Non-response

It is realistic to assume that no matter how rigorous our efforts are to maintain the panel by efficient tracking procedures and motivation, to minimise attrition, there will be some individuals who will be unavailable on one or more waves, for a variety of reasons, for the annual face-to-face interview. The use of alternative modes of data collection such as self-completion questionnaires, the telephone or proxies to obtain information must therefore be considered.

The use of telephone data collection suffers many problems. Research shows that initial contact by phone is more likely to suffer from non-response, that is it is much easier to refuse straight away by hanging up, a problem perhaps being specific to the UK. In some respects contact by phone, as a secondary substitute for face-to-face interviewing, appears to elicit more 'honest' answering of sensitive issues, provided that the informant is fully aware of the nature, types of questions and usage of the survey (Collins 1987). The SIPP which intends to employ a 50:50 sample of face-to face and telephone interviews, reports that telephone respondents give less detail to open questions and more 'rounded' financial data, but report health events in more depth (SIPP 1986).

An alternative method of using telephones is to employ the LFS strategy, which for the purpose of obtaining a longitudinal monthly account of employment, contacts respondents monthly to ascertain whether they prefer a face-to-face or telephone interview (70% prefer subsequent interviews by phone). Although this is not appropriate for the BPS annual waves of interviewing, it is worth bearing in mind as a possibility for respondents who are hard to make contact with or for added qualitative detail and ad hoc studies.

The major drawback is the incomplete coverage of phones in the UK, i.e. less than 80%, which is biased for class, age and other socio-economic factors. Thus it cannot be considered as a wholly adequate back-up means of collecting data.

(ii) Collection of Complementary Qualitative Data

The possible use of self-completion questionnaires and diaries is highly desirable to provide more qualitative information and as a means of checking the reliability and validity of the interview responses. Suggestions which have already been put forward by various AGs, include the use of self-completion forms which respondents could fill in to document their own life history. Diaries were also a welcomed suggestion, especially for income and

expenditure and areas such as household domestic patterns and decision making etc. The obvious measurement errors of reactivity and conditioning for these methods is an issue which fieldwork should consider in depth.

It would of course be highly desirable to supplement data collected by the questionnaire and other primary sources by administrative record data, e.g. from central or local government or from the census. For example, the SIPP link data to National Insurance and Social Security numbers. However given the Data Protection Act in the UK the possibility of data linkage at the present time is a not realistic proposition.

A final point is the collection of data at the environmental and geographic level. How much time to devote to asking the respondent about their neighbourhood, amenities and facilities etc, and which sources should be consulted i.e. Local Authority Information, and Small Area Statistics is another matter which should be addressed.

QUALITY OF DATA

As every survey instrument has its faults and degree of bias, a panel study has added complications since we are confronted with repeated measures for the same individuals over time. Panel conditioning and validity of retrospective data are two such potential sources of error which have implications for research design.

(i) Retrospective reporting

There are clearly a number of factors affecting the accuracy of retrospective data, excluding interpretation and sampling error.

- the load of reporting on the respondent
- failure to recall events as they recede into the past
- events remembered but dates incorrect
- events remembered but descriptive details incorrect
- interviewer effects
- effect of regular or continuous reporting (see below)
- behavioural changes
- bias from different response

Much research has been directed towards validation of such data, but in some respects we can never distinguish between 'real' and 'influenced' behavioural or attitudinal change. To elaborate on some of these points, analysis of some of the major panel studies has revealed modes of questioning that should be used with consideration. The use of retrospective data clearly must be objective, if it is to avoid bias as much as possible.

Two types of retrospective questions may be distinguished; firstly asking for events which have occurred which are important to the individual, and secondly the use of calendars on a regular basis between waves, for example monthly accounting of income and activity patterns. From the GSEP it has been shown that coincidence of calendars and wave reporting are generally high, but for some aspects particularly low, e.g. professional training, short spells

of unemployment which are underreported and negatively valued (Galler 1984). The PSID highlights error for one-off benefits, and for less salient aspects, such as calendar year total earnings, unemployment, sicktime and to a greater extent reporting of average hourly earnings.

One problem highlighted is that date of events are not clearly defined in social processes but are often gradual transitions. Validation of the SIPP's collection of monthly accounts of income, gives evidence of the use of spell-based recall being less biased than episodic recall i.e. monthly accounting is less accurate than that based on reported spells. This has implications for calendary information which the GSEP suggest should be used with caution.

Realistically the best way to overcome over- or under-reporting of events is to reduce the time intervals between waves, although cost is a negative factor, or to rely more on observations at the time of the interview. The SIPP employ a four month reference period to collect income data in preference to the yearly reference period used by the PSID, to reduce reporting error; avoiding telescoping effects after the first wave by bounded recall i.e. excluding events already reported, and reducing respondent burden which depends on length of reference period. They also suggest that a longer recall period may understate the percentage of income reported in earlier parts of the period, i.e through memory loss.

It is thus important to press for accurate recall and clear definition of accounts. The use of diaries or time budget methods are an added check on reliability, which are also reviewed in this report. Clearly cost is a major factor in obtaining the most reliable retrospective data.

(ii) Panel conditioning

There is always a danger of reactivity and conditioning in any means of data collection. Face-to-face interviewing inevitably suffers interviewer effect, but conditioning is a problem specific to studies over time. As pointed out above how we can disentangle reflected or genuine change is no easy matter, but on a more positive note repeated interviewing may sensitize respondents, leading to a higher quality reporting or better recall. For example the SIPP (1986) has reported evidence of the elderly consistently reporting worse health on the first wave, and there appears to be fewer 'don't knows' and more inclination to report socially undesirable answers on later waves, and for voting there is more accurate responses on subsequent waves. Equally there is increased quality of reporting on savings for longer term panel members. In similar studies the BSAS data suggests that respondents are more likely to admit deviant behaviour (BSAS 1985).

These reports import the need to document all aspects relating to data collection (see later discussion on communication).

(iii) The use of Proxy Data

The necessity to obtain a consistent gathering of data across time for each panel member is clearly a desirable prerequisite for a successful panel survey. However incidences of temporary or permanent absence from waves or sections of the questionnaire will disrupt the continuity of the record, at the individual, family and household level. The use of proxies requires

careful consideration, the pros and cons being well documented. For obtaining more 'factual' data for an individual, proxy data will suffice, but it cannot provide us with reliable details of income, education and attitudes. Thus a compromise has to be made as to how much information is surrendered and how much reliable information can be gathered. Of course the definition of a 'reliable' proxy is another stumbling block. The SIPP (1986) have developed a set of "respondent rules" dependent on the quality of data and level of non-response, which determines a hierarchy of proxy informants in order of;

1. spouse,
2. adult who was previous proxy
3. individual who was proxy at any other interview
4. other first time proxy

Whether a special questionnaire should be used for proxy data is another point. The SIPP and PSID use proxies only as a last resort after failure to contact by telephone, as means of obtaining missing data. The GSEP do not use proxies since it is not legal.

For the consideration of analysis, it is therefore vital that documentation distinguishes between data obtained under direct or proxy circumstances to account for potential error and bias.

(iv) Use of Questions from other Studies for the Panel

This is an area which has come up in a number of AG discussions relating to the Question Bank. Although we have selectively gathered together questions from existing panel studies and other national surveys, I can see two problematic areas;

(a) Firstly that some of the questions have been obtained from earlier years of the surveys and thus exclude many of the modifications which have come about as a result of validation and enumeration studies by the respective survey organisations. For example OPCS pay close attention to methodological testing of their surveys, the results of which are fed back into constructing better survey instruments, i.e. interpretability of classifications, coding and question wording. Thus we need to make use of this type of research, by using the most up-to-date issues of questionnaires, and noting the areas of potential and recommended changes.

It is therefore desirable that the IRC Resource Centre and possibly a Research Officer should devote time and space to collecting, reviewing, documenting and disseminating such current validation studies and methodology reports from all surveys we have selected for the question bank. In the interests of 'getting it right' the first time for the comparability over time for the Panel Study this is an area of immediate concern.

(b) Secondly is the validity and reliability of the use of cross-sectional questions for the panel, a topic which has arisen in various AG meetings. Questions must therefore be considered with reference to the dynamic aspect of the survey, and those from reputable Panel Studies should be examined preferentially. The major problem here is the appropriateness of many of the questions and topics to the UK, i.e. existing formats to potentially "good" questions must be tailored to fit demographic and socio-

economic characteristics and phenomena specific to the UK. Clearly these areas are covered by the large national UK surveys such as the GHS, FES and LFS, thus we must seek to incorporate such information into longitudinally designed questions.

QUESTIONNAIRE DESIGN

Length of Interview

Existing panel studies vary in their length of questionnaire and interview time, from 45 minutes for the GSEP (15 minutes for household interview and half an hour for the individual interview) to 1 ²/₃ hours for the National Survey of Families and Households. Fieldwork and pilot testing for the BPS should establish the optimal length of interviewing time, given the requirements of the questionnaire.

Questionnaire Design

The first point is the need for a separate household and individual questionnaire. The household section in many other panel studies, employs an interview with a pre-defined or randomly selected 'head' of household.

A good example of the sort of format design we might require is provide by the SIPP model (SIPP 1984). This incorporates four sources of data;

- 1) a 'control card'
- 2) core data questionnaire
- 3) modular questionnaires
- 4) structural level/environmental data.

1) The purpose of a control card is similar to that of a cover sheet, to record characteristics and keep up to date information at the individual and household level. Essentially it should keep details for each household member on;

Age
Sex
Ethnicity
Country of Origin
Marital Status
Educational Level
Employment/Income from the questionnaire.
Information on housing unit and relationship within households for the current wave.
ID number
Successful/drop-out/refusal

For subsequent waves; Note of change of address, new members, splits (noting new address)

2) The core data will be the bulk of the questionnaire covering the main areas (from respective AGs) and demographic information. This may comprise two interviews, household and individual.

3) The SIPP administers some topics as 'fixed' or 'variable' topic modules at pre-selected waves, the latter consisting of specific histories and other non-reoccurring sources of information. Appendix II gives details of the topical module schedule. Similarly the GSEP in its first two waves collects biographical information on family and occupational histories, whilst the following three waves contain topics on environmental issues (wave 3), social security (wave 4), and savings, wealth and assets (wave 5).

In particular research design must incorporate marginal choices i.e. the alternatives people thought they had and whether they thought they had any at all, thus we must ask about responsible alternatives despite lack of change (Duncan and Morgan 1984). Experience from the PSID also points to the need to schedule special topics which are added intermitantly and these should be based explicitly on ideas about where change is likely and about the speed of possible responses e.g. housing change does not require annual measurement but response to change in family consumption may be more rapid than responses to change in wage rate. A systematic plan for timing of special questionnaire sections across waves is thus a major consideration.

An event history approach to data collection, for example for labour market information for the prior year is highly desirable. Questions on alternatives and process of choice (as discussed above) and on respondents level of information about facts and confusion over economic insights etc, which are relevant to their choices is also a requirement. The need for a 'benchmark' for example to estimate wealth (assets and debts), will allow for accumulation, thus pointing to the need to ask early in the panel about retirement plans and provisions. These types of issues relate to the forecasting and prospective dynamics of the panel. Duncan and Morgan (1984) also stress that the panel study builds up documentation to give early release thereby obtaining feedback and suggestions for future waves.

4) Data at the structural level e.g. environmental information and county-level data about unemployment, labour market demand, health service availabilities and amenities etc, is also a major point for consideration. Bearing in mind the dynamic aspect the information should be geared towards expectations of future changes.

DEMOGRAPHIC INFORMATION

The necessity to establish relevant and accurate demographic information across households for a panel survey is twofold; firstly to keep track of the sample members over the course of the panel and secondly for the purpose of analysing household structural change and family dynamics.

Duncan et al. (1987) from the PSID distinguish between crucial and desirable demographics recorded at the household and individual level, listed in Appendix III, these naturally resting on the definition of household and family (see below).

TRACKING OF THE PANEL

A variety of factors have been found which influence the success of tracking sample members including; size, dispersion and mobility of sample, time elapsed between waves, and persistence and ingenuity of the tracers (Clarridge et al. 1986). Sources of tracking are conditional on the type of information gathered at the first interview, and research suggests that it is desirable to obtain the following observations (McAllister et al. 1982);

- a) mothers and fathers maiden name, addresses and birth dates
- b) next of kin and emergency contacts
- c) place of birth
- d) National Insurance number, National Health number, Social Security Number
- e) doctor/ GP
- f) telephone number and name of holder
- g) main places of social activity and leisure, associations etc.
- h) place of work, job title, name of employer
- i) spouses occupation
- j) T.U. membership.....etc.

How realistic it would be to obtain any of these is a matter of testing in the field.

In addition to these tracing sources, other means of tracking reported from studies, most relevant for the young who are most mobile, include;

- marriage records
- school and college records
- neighbours
- Electoral Register
- Telephone Directory
- DHSS
- Local Authority, housing departments etc.
- Probation and Judicial records
- Parents employers
- Department of Vehicle and Licensing Centre.....etc.
- Post Offices
- Military Services
- GP registers
- Appeal to local or national media

The regular dispatching of address correction cards throughout waves is also a means of keeping track, although these do not have a particularly good record of success. The SIPP offers a small financial incentive for return of their yearly 'reminder' cards. Also making a sustained effort to recontacting non respondents in the year(s) following a non-response wave has been found to be successful, as the SIPP do, but most other studies do not.

HOUSEHOLD AND FAMILY DEFINITIONS

Much of the discussion and formulation of household and family definitions is the responsibility of the respective AG, which is clearly crucial for defining who constitutes an eligible sample member. Much of the present research design for the BPS has been devoted to this subject and the following section gives an overview of how other panel surveys have approached this subject.

1) The SIPP recognizes five types of longitudinal household concepts, for which the household continues if the same definition applies at later waves. These definitions are based on; (a) reference person, (b) principal person, e.g. wife for married couples, (c) family type (d) type and size and (e) a hybrid of (a), (b), and (c) based on householder or principal person maintaining a certain role over time (Hernandez & Moorman, 1986). This suggests that definition (c) will recognise dissolutions into two new households following divorce, whereas (a) and (b) will recognise only one. At the extreme (d) recognises every change and will show the greatest increase in households over time. Data from the PSID report that in total 17% of households experienced change of some kind, and 57% underwent change in size but retained type.

The family definition is separate from the non-family household and is based on "shared experience" of householder and spouse. Their longitudinal family comprises;

"two or more related persons - at least one of whom is the householder or spouse of householder who had the same experience for two or more consecutive months"

Clearly a problem arises over what constitutes "shared experience". The sample is weighted in terms of household based estimates.

2) The PSID defines a Family Unit in terms of physical boundary, and conveys this definition to the respondent during household questioning, to gain a subjective definition.

3) In contrast, the Irish Panel Study's definition of a household is;

"a person or group of persons who all live regularly at the address given on the sample list and for whom food is provide for at least one meal a day by the same or rota of persons"

4) Similarly, the UK Census definition of the household is based on common catering/ shared kitchen or shared living room, but the 1991 definition will acknowledge the option of sub-division into smaller separate households. Clearly the latter two definitions ignore other dimensions of "shared experience" which the SIPP household will include.

These highlight the differential definitions used by existing panels, and our work on arriving at an appropriate definition will undoubtedly yield a very

different, but hopefully improved one. This of course has implications for the comparability with other national panels.

Many of the panel studies also define a head of household, whom is selected as the interviewee, rather than interviewing all household members. This is usually defined as the person who owns/pays the rent or is entitled to accommodation i.e. tied or related). In many cases e.g. the PSID, the head is always primarily male. However a 'head' is not relevant to the BPS since we intend to interview all household members and have in mind a self-voluntary approach to answering questions on the household.

'FOLLOWING RULES'

This is an area of research design which should command much attention. The following discussion outlines some of the existing procedures available for defining who to include in the panel, and following and tracking the panel over time.

The PSID defines its sample members as;

- a) Living in a family unit from the original sample.
- b) Family unit member in an institution temporarily.
- c) Anyone 'born' to an original sample member and 'born into' the family unit.

To define which "sample units" should remain or drop out of the panel and whom to include as "new members", a clear concise set of rules needs to be laid out. The SIPP has a well documented set of "Following Rules".

Leavers: A panel must decide on the criteria for leaving, other than for unavoidable reasons, i.e. death or emigration, and differentiate between leaving and moving, the latter being members which we continue to follow.

Movers: Firstly we need to distinguish between permanent or temporary movers, for example should we continue to follow those become institutionalised, and check whether they are still in an institution on later waves, and if so follow them as movers.

Growing into the panel: We need to determine how younger members of the household become part of the panel as they grow older. In the SIPP all those in the household under the minimum eligible age (15) will be included in the panel except those who leave before they reach this age. Anyone born to a sample member who was non-response is classed as a non-sample member.

Immigrants: We also need to establish whether immigrants will become new members. The SIPP does not incorporate immigrants into the panel, nor those returning from institutions, however the GSEP recruits immigrants moving into the sample household into the sample, who are followed if they split, but not if they came over to form separate households.

Split-offs

The GSEP has coverage of household members who do not live in the household but remain economically part (e.g children, relative abroad etc.) and following is restricted to those remaining in the country. Non-sample members now living with sample members in later waves enter into the sample, but if these households split only the sample members are followed. The PSID rules specify that if two sample members split off to form a family unit, as defined, they are treated as one family unit with the older member as head or sample member (but NOT a nonsample member). Rules must also specify which split households should be retained in the sample (e.g the PSID procedure retains households if at least one member is in the sample), and it is also important that for non-responding split-offs data is collected from the original household or other available sources.

The problem remains as to whether to follow non sample household members who join the panel when they split off. Clearly this depends on fieldwork expenditure. The discussion on weighting below gives more detail on how to deal with split offs.

Non-response

Non responses should not be dropped for example movers and recalcitrants should be chased even if they are missing for more than two waves.

OTHER DEMOGRAPHIC DEFINITIONS

Although the following observations do not exhaustively cover all demographic details we require, they highlight some of the problems previously encountered by other studies. Again the 'Household Structure' AG will be grappling with the nitty gritty of these issues.

Marital Status and Co-habitation

Definitions of co-habitation depend on the definition of the household, and are only relevant if there is someone in the household the respondent might be living with, excluding a partner who does not stay regularly. If the household definition states that the household member must regard the household as their main residence, there is clearly a problem with defining if persons are co-habiting. Questions should therefore ask if respondents are living together as a couple. Problems may be encountered in collecting cohabitation histories using this phrase as it may be construed as a premarital situation rather than one precluding for example a separation.

Defining remarriage in longitudinal studies is another problematic area. For example a woman with children who is classified as female 'head' in wave 1 is considered remarried if she lives in a male headed household and can be reasonably be classified as the wife of the head in waves 2 or 3. To determine this the age of the wife in waves 2 or 3 is compared to the age of the female head in the first wave. This would then be consistent with the model where two people of the opposite sex are considered married. Reconciliation is treated as a form of remarriage.

Fertility

Questions on expectation of birth, according to the GHS, suffers from a high proportion of 'don't knows'. A more reliable question is to ask those who said they didn't know if they'd have children in the future is how many they thought they'd have in all, which lowered the response rate (Donnell, 1986)

Ethnicity

Evidence from UK studies such as the BSAS has found that existing ethnic group classifications are found to be notoriously unreliable. Language identification is evidently no clear indicator when one considers that an individual may command to a different degree the language they speak, understand, read and write. Surveys in areas of diverse ethnic population have attempted to incorporate classifications which account for such variability (e.g. Haringey Education Authority in which 72 different ethnic groups have been recorded). We must therefore think carefully about coding of ethnicity.

DATA REQUIRED FOR ANALYSING HOUSEHOLD CHANGE

A desirable requisite would be a replacement mechanism which allows families or individuals to enter the sample with known selection probabilities. A model we should pay close attention to is the framework for tracking family relationships over time by Duncan (1985). Based on lessons from mistakes from the SIPP and PSID he outlines a proposal for a data structure for analysing household structural change, which can only be constructed if the crucial information on household relationships and living arrangements have been properly coded. This requires that selection probability of subunits within a household i.e. families, individuals etc, is identical to the selection probability of the household sampled. Thus a properly coded set of rules, as discussed above, regarding the definition of units and tracking these units over time is essential. The requirements for information are as follows;

- 1) movement within extended families
- 2) relatives of co-habitors
- 3) detailed account of childrens relationship to all members of households they have resided in
- 4) movement of children within ex-household members households

Thus it is important to distinguish between blood and step-relations, and ascertain who is living whom and where. Also we must distinguish between co-habitors and relatives as spouses, and must be able to link individuals who have descended from the same original household. The construction of such files is considered below.

A data file with a relational structure which identifies all individuals who were ever part of the household, is as discussed under documentation, again crucial to the success of the panel study. From this we can obtain information on relationships between each pair of individuals who are related or shared the same dwelling for each period specified in the panel period. It

is vital that we avoid the mistake of failing to classify individuals independently of time, as the PSID did.

A link file would have a separate record for each individual, sample, non-sample and non-response including;

- a) ID
- b) birth, date
- c) sex
- d) sample or non-sample
- e) present at each time period specified
- f) all relationships, where 'related' is defined as ever living with a person who was in same household
- g) periodic accounting (e.g. month by month) of how the two individuals are related
- h) periodic accounting of whether two individuals shared the same household or family unit.
- i) available total household information

This necessitates the collection of;

- 1) unique ID of natural parents - from fertility history or control card (cover sheet)
- 2) Information on married/ cohabiting status and their relationship to others in the household
- 3) Which individuals shared the household in each specified period
- 4) A comprehensive coding for leavers.

Duncan's paper gives detail of such procedures.

The PSID uses two data records; the Family Data Record containing information on variables for each year which is available for public use. For example this file gives access to ex-spouse file, sibling file, split off file etc. The other file is the Single-Year Family File which is not usually documented or released but which is merged with all other information to give the Cross-Year Family File.

WEIGHTING OF SAMPLE UNITS

Since the panel must cope with 'natural' and other forms of attrition, we must define how weights are assigned. In the PSID for example, weights are based on differential control selection probabilities (i.e. selection bias) and differential non-response, i.e. are not ratio-estimates. We should consider that the samples followed are representative with respect to the original population, but NOT with respect to changes taking place over time. Duncan and Morgan (1986) advise that a separate estimate of the probability of being in a selectively biased group should be made as a function of variables not used in the main analysis.

Bearing this in mind we must formulate the rules stressed above which will allow for families or individuals to enter the sample with known selection probabilities.

Since a families or household is a probability sample, the same also applies to each member therefore the family weight is the appropriate individual weight for all individuals. Those born into sample families are assigned the sample probabability and weight of the family. For split-offs in which both spouses in the 'new family' have equal sample probability, the sample probability is twice that of the sample spouse and the family weight is therefore half of the individual weight of the sample spouse. Children born into the family are therefore assigned this halved weight as their individual weight.

These procedures appear to be complex, but it is essential that we define our 'following' criteria at an early stage, preferably with some respect to the SIPP.

LINKING INFORMATION

Crucial is the setting up of a unique identification system. A system is required that allows;

- 1) linkage of an individuals data over time.
- 2) linkage of each persons data to the unique household or family to which they belonged during each wave.

The SIPP have developed a systematic ID notation consisting of a unique 14 digit number for each member, of which parts represent specifics of sample selection, region, current and entry address and person identifier (Nelson, McMillen & Kasprzyk 1986). A scrambled version of the number is used for the public use file to ensure anonymity.

DOCUMENTATION OF DATA COLLECTION AND FILE STRUCTURE

As pointed out in the discussion of proxy data, the mode of data collection and other potential sources of measurement error which might occur need to be documented in the form of a meta-data file, so that they are available to users of the data. Sources of measurement error include;

- a) Any change in the method of obtaining information by using an alternative substitute method through non-contact etc.
- b) Modification to the questionnaire.
- c) Change in interviewers.
- d) Simple response variability i.e. context of interview, mood, place, time etc.
- e) Change in the interpretation or meaning of a question over time.
- f) Change in coding procedures, e.g. of occupational categorisations through recording or response error.
- g) Errors at the data entry stage, e.g keying errors.
- h) Matching files, hence the neccessity for using a unique ID numbering system.
- i) Demographic inconsistencies, either recording or response error (the

SIPP suggests that in general the most recent response is taken as most accurate)

The retrieval of longitudinal data, and the implications of change in encoding and processing, wave missingness and mismatching of data is an area of utmost significance to the documentation of a panel study (David, 1985). As full as possible data on the observations is crucial for the purposes of communication, and consequently meta-data should NOT be mixed with data on observations per se. We need to address all known sources of error, coverage and other elementary sample selection criteria (see above)

A dimensional set of observations is conditional on its DESIGN (i.e. selection of sample and set of alternatives) its INSTRUMENT and CONTEXT. Thus any notation must include these factors. Specifically we must concern ourselves with how to describe the research instrument. Since observations are recorded serially, some are conditioned on prior observations, so the documentation must provide succinct description of order & conditioning, e.g. by the use of a "predecessor relation" which comprises entry for;

- constructed variable names
- value or condition (range and uniqueness)
- upper and lower range
- dependent (first contingent) question
- associated (name of reference) variable
- associated values in a reference list
- name of values (characterization of condition & resulting sub-population which provides discrepancies between the questionnaire and data-set)

The distribution of responses is not invariant of ORDER of asking, a question which is often ignored.

A second requirement is to provide details of alternatives which might affect the distribution of responses. e.g open vs. pre-coded, use of props & show cards etc, and also the validation or analysis of the instrument, i.e. for bias, reliability, reproducibility.

In recording the meanings of observations entries for a given attribute should include;

- (i) the literal (face value) entry. Valuation function (of observation and external information) gives us indices of data quality; bias, mean square error, reliability etc. To accomplish this analysts must systematically communicate their discoveries about valuations back to the data collectors.
- (ii) errors, detected by effects on aggregates.
- (iii) meta-data, artefacts of procedures for missing observations
- (iv) not-in-universe entries
- (v) reasons for missing observations (see discussion above). Usually in practice the blanks and zeros that fill variables that were not in subsequent measurements are mistakenly interpreted as null values and analysed as observations.

and proposes to construct a research file for release which contains twelve months of data, at the individual level and for longitudinal household and family membership (Kasprzyk, D. and Herriot, R.A. (1984).

SELECTION OF SURVEY AGENCY

The sheer complexity of the BPS means we are extremely limited in our choice of fieldwork agencies. Few have the experience and capacity to deal with such a large piece of work, and as discussed earlier in the paper, the quality of interviewers and organization of fieldwork is a major necessity. SCPR, PAS and NOP Ltd. are the only ones we have are able to suggest, but there might be a chance that the OPCS SSD interviewing team will take on contact work. The commercial agencies such as MORI and GALLUP are not being considered. It has been pointed out that there are even fewer choices of survey agencies available in Scotland, and System Three is the only name that has been put forward. We are pursuing these items in more depth, but welcome any recommendations and advice from AG members.

SUMMARY

To summarise the research design issues which relate to the research instrument at this stage, they are;

- questionnaire content
 - rotation of themes over years
 - coding
 - sampling strategy
 - persons to be interviewed within families or households
 - procedures to track respondents over years and replace drop-outs
 - data gathering methods; face-to-face, annually, self-completion questionnaires and diaries etc.
 - solutions to problems of quality of information gathered; selective recall bias, organization of data files and confidentiality etc.
 - selection of fieldwork agency
-

Table 8

Characteristics of Various Panel Study Projects

Study	Country	Organization Running the Study	Sample Size	Initial Population Coverage	Duration of Study		
					Year Begun	Waves Completed to Date	Future Waves Definitely Planned
Panel Study of Income Dynamics (PSID)	USA	Survey Research Center	5000 households	Noninstitutionalized population	1968	18	6
Socio-economic Panel (SEP)	Federal Republic of Germany	Deutsches Institut für Wirtschaftsforschung und Universitäten of Frankfurt & Mannheim	6000 households	Noninstitutionalized population	1984	2	3+
Panel Socio-economique "L'Étude de la Population, de la Pauvreté, et des Politiques Socio-économiques (CEPS)	Luxembourg	Center D'Études de Population, de la Pauvreté, et des Politiques Socio-économiques (CEPS)	3000 households	Complete	1985	1	Indefinite
Panel Socio-economique Lorraine	Lorraine Region of France	Researchers at the University of Nancy and INSEE	3000 households	Complete	1985	1	Indefinite
Panel Study on Household Market and Nonmarket Activities (HUS)	Sweden	University of Gothenberg and Industrial Institute for Economic and Social Research (IUI)	2000 households in 1984 3000 households in 1985	Noninstitutional Swedish-speaking population 18-74 years of age	1984	3	1, possibly more
Survey of Income & Program Participation (SIPP)	USA	U.S. Bureau of Census	20,000 households in 1984 16,000 in 1985	Noninstitutionalized population	1984	6	Indefinite
Socio-economic Panel Survey	Netherlands	Central Bureau of Statistics (CBS)	3080 with increase to 4000	Noninstitutionalized population	1984	3	Will continue indefinitely
Benelux Panel Survey	Belgium, Netherlands	Center for Social Policy	7000 households	All households	1985	1	Indefinite
Level of Living Survey	Sweden	Swedish Institute for Social Research	6000 individuals	Individuals 15-75 years of age	1968	3	Uncertain

Table 8 (continued)

Study	Frequency of Interviewing	Who is Respondent?	Response Rates			Purpose of Study	Who Controls Content of Study?
			First Wave	2nd wave (as % of First Wave)	Later Waves		
Panel Study of Income Dynamics (PSID)	1 time per year	Head of household	75%	86%	97-98%	Describe and explain change in economic status of population. Initial focus on the poor	NSF-appointed Board of Overseers
Socio-economic Panel (SEP)	1 time per year	All household members 16 years & older	64%	85-90%	-	Income, employment, social security savings, credit, household production, labor supply, evaluation of income and some other subjective questions, housing	Researchers running the study & Advisory board
Panel Socio-economique "Lleven zu Letzberg" (PSELL)	1 time per year	Head of each "Income Group" in household	? (still in field)	-	-	Poverty, social security indicator, intra-household exchanges	CEPS
Panel Socio-economique Lorraine	1 time per year	Head of each "Income group" in household	? (still in field)	-	-	Poverty, social security indicators, intra-household exchanges	Researchers in University of Nancy and at INSEE
Panel Study on Market and Non-market Activities (HUS)	3 times in first year, once in second year	Head and Spouse	75%	97%	97%	Describe and explain economic status and market and nonmarket behavior of households. Focus on labor supply, housing, income and wealth, and, initially, time-use and consumption expenditures.	Researchers running the study
Survey of Income & Program Participation (SIPP)	3 times per year: new panel begins each year	All household members age 16 & older	93%	95%+	95%+	Income distribution, participation in income support programs, amount of assistance from social insurance, assistance	Census Bureau, advised by OMB Interagency Committee & SSRC Committee
Socio-economic Panel Survey	2 times per year	All household members age 16 & older	53%	88%	-	-	Board of Directors of CBS
Benelux Panel Survey	1 time per year	Head of household	? (still in field)	-	-	Poverty-income, (re)distribution of effectiveness of social security in reducing poverty	Center for Social Policy and Ministry of Social Affairs
Level of Living Survey	Once every seven or eight years	Named individual	91%	95%	97%	Change in variation in level of living	Swedish Institute for Social Research

APPENDIX II

Figure B-1. SURVEY OF INCOME AND PROGRAM PARTICIPATION
TOPICAL MODULE SCHEDULE -- Continued
1986 Panel

INTERVIEW DATES	1986 PANEL		
	Wave	Fixed Topical Module	Variable Topical Module
Feb. 86- May 86	1	None	None
June 86- Sept. 86 *	2	Fertility History Marital History Migration History Reciprocity History Employment History Work Disability History Education and Training History Family Background Household Relationships	
Oct 86- Dec 86	3		Child Care Arrangements Child Support Agreements Support for Nonhousehold Members Job Offers Health Status and Utilization of Health Care Services Long-Term Care Disability Status of Children
Jan 87 - Apr 87	4	Assets Liabilities	Pension Plan Coverage Lump Sum Distributions from Pension Plans Characteristics of Job from which Retired. Characteristics of Home Financing Arrangements
May 87- Aug 87	5	Annual Income Taxes Individual Retirement Accounts Educational Financing and Enrollment	
Sept. 87- Dec. 87	6		Child Care Arrangements Child Support Agreements Support for Nonhousehold Members Work Related Expenses Housing Costs Energy Usage
Jan. 88- Apr. 88	7	Assets Liabilities	
May 88 - Aug 88	8	Annual Income Taxes Individual Retirement Accounts Educational Financing and Enrollment	

* These modules are collectively identified as the Personal History Topical Module.

APPENDIX III

Crucial Demographic Information

- A. Marital Status - HH level: 1) Respondent at wave
2) Couple status
3) Change in head Marital Status
- Ind level: 1) Respondent at wave
2) Date of marriage
3) Frequency
4) Change in Marital Status (ind.)
5) Whether partner is present
- B. Fertility - Ind level: 1) Births, sex, date, mother and father
- C. HH structure - HH level: 1) Current hh composition
2) Number of lodgers (excluded from HH)
3) HH composition change in head
4) HH composition change in HH members
5) Number of male/female children
6) Head and partner
7) Age of respondent at wave, DOB, sex
8) Age of partner, DOB, sex
- Ind level: 1) Relationship to head
2) Composition re. movers and leavers
3) Non-response of individual (reason)
4) Position of ind. within HH (sample member or not)
- D. Family Composition - HH level: 1) Number of persons at current wave
2) Number of months of single occupation of HH
3) Number of months of two occupation of HH etc. up to 10 or more people.

Desirable Demographics

- E. Marital Status - Ind level: 1) Number of times married
2) Month, year for each marriage
3) How marriage ended, month and year for each
4) When stopped living together for each.
- F. Fertility - Ind level: 1) Birth of children (natural)
2) Sex, date
3) Child present or not
4) deaths recorded of children
- G. HH Structure - Ind level: 1) If natural mother present in study
2) If natural father is present in study

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