

**COMPARATIVE RESEARCH ON
HOUSEHOLD PANEL STUDIES**

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A Comparative Analysis of Attrition
in Household Panel Studies

by

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Comparative Research on Household Panel Studies

This series presents the results of research projects based on the analysis of one or more household panel studies. Papers will cover the wide range of substantive topics and investigations of the particular problems of comparative research.

The series will contain, among other papers, the results of all of the work being carried out as part of the Panel Comparability (PACO) project, which was funded by the European Commission under the Human Capital and Mobility Programme (1993-1996). PACO aims to develop instruments for analyzing, programming and stimulating socio-economic policies, and for comparative research on policy issues such as labour force participation, income distribution, unpaid work, poverty, household composition change, and problems of the elderly.

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- Lorraine Panel Study, ADEPS/URA Emploi et Politiques Sociales, Nancy
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ABSTRACT

This paper examines aspects of the use of cross-national comparative research methodologies to review characteristics of respondents who cease to participate after the first wave of a longitudinal household panel study. In general terms, this kind of non-response in survey research is known as panel attrition. The first stages of the paper look at non-response generally as a source of bias in survey interviews and then focus on panel studies. This is followed by a discussion of cross-national research and the opportunities it presents for the study of panel attrition. The Panel Comparative data base (PACO) was identified as a suitable resource and in terms of methodological findings, proved to be an excellent tool for our purposes. From the PACO data base, similar panel studies from France, Germany, Luxembourg, and the UK were analysed for the characteristics of respondents not re-interviewing in the second or third wave of the study, using the Pearson's Chi Square test for significance. In general terms, our findings were in line with other studies suggesting distinct characteristics for respondents who are subject to panel attrition in the second and third wave. There is also a review of the demographic changes through which respondents pass during the first three waves. The findings imply that for all the four countries, such demographic changes are consistent which further strengthens the assumption that respondents have similar patterns in terms of response across nations.

CHAPTER 1 INTRODUCTION

1.1 Summary

This project involves a cross-national comparison of characteristics for individuals who cease to participate in longitudinal household panel studies after the first wave. The countries being used for this analysis are those in the PACO data base and include Germany, France, Luxembourg, and the UK. The main purpose of this research is a methodological one to evaluate, first, how these characteristics of non-respondents give us insight into non-response in survey research, and secondly, methodological aspects of using cross-national research for the study of non-response. It is acknowledged that sophisticated statistical techniques of imputation and weighting exist for dealing with non-response bias. This, however, will only be very briefly introduced because the bulk of this paper will be taken up with distinguishing similarities that may exist between respondents of panel studies who fail to participate, having been initially interviewed in the first wave.

1.2 Introduction to the Topic of Research

Non-response comes in many forms and can be caused by a variety of different reasons, all of which have some impact on the representativeness of the survey. It is therefore important to distinguish what type of respondents are not participating in surveys. This is especially important for longitudinal panel surveys which may become increasingly less representative of the population they are surveying if particular types of respondents regularly leave the survey. For this reason it is important to investigate this possibility, with Kasprzyk et al (1989) implying "the main concern about panel non-response is that the non-respondents may differ in systematic ways from the respondents". If the respondents who leave longitudinal panel surveys do have distinct characteristics, then these characteristics should be common in all similar types of panel surveys and may contribute to non-response bias. It was discovered by Kalton (1986), and Goldstein (1976), that it is possible to identify in panel studies the characteristics of wave non-respondents after the first wave. They found for some first wave variables the characteristics of wave non-respondents are similar to wave respondents but there are also a number of variables which show differences. The focus of this research will therefore be on a comparison of different household panel surveys in order to estimate the extent of similarity in characteristics of respondents leaving the panel. This also strengthens any outcomes developed in one panel if it can be replicated in another.

This raises several methodological issues, among them the identification of similar longitudinal household panel surveys to compare. It is unlikely that there will be more than one longitudinal household panel survey in any one country so cross-national comparisons are required. This introduces some methodological concerns of compatibility, which can be addressed, and are to some extent reduced, by using a comparative database, as demonstrated by Schaber et al (1993). Another methodological issues needing to be reviewed are the field work procedures employed by the longitudinal panel surveys in reducing attrition in their panels and what importance, if any, this has. Duncan et al (1986) reported associations for non-response and first wave characteristics using a simulated sample of the Panel Study of Income Dynamics (PSID) which had the effect of reducing the level of effort made to retain sample members.

Non-response takes two forms as described by Kalton (1986); first, unit non-response where it is not possible to collect any survey data from or about a particular member of the sample, and

second, item non-response where a cooperating sample member fails, or refuses, to provide some specific items of information. This research will concentrate on unit non-response which arises when units, such as individuals or households selected for inclusion in a panel survey, fail to provide all of the data which it is intended to collect. Unit non-response occurring in interviews from panel surveys based on probability samples will be examined. Problems of non-response in the first wave of the panel survey are similar to those of cross-sectional surveys and will not be assessed because of lack of information available on the respondents who were not interviewed at the first wave.

To put this in very general terms, we are assuming that if characteristics of respondents who leave longitudinal household panel surveys are distinguishable, these characteristics will be similar in equivalent longitudinal household panel surveys across different countries. Taking this a step further, it is understood that there will be many reasons for respondents not participating in surveys and cultural differences across countries may well influence findings. Despite these influences it will still remain possible, given the appropriate tool, to identify types of respondents who leave panel studies because there will be a pattern to these respondents.

CHAPTER 2 METHODOLOGICAL REVIEW

2.1 A Review of Non-Response

Unit non-response can be attributed to one of four main factors, the first of which is fieldwork shortfalls. This can occur when the sample has not taken the operational capabilities of the field force into consideration and a few sample members have not been approached because of their inaccessibility, extreme weather conditions, unavailability of interviewers and so on. Secondly, there will be sample members approached but not contacted within the fieldwork period, which depends mainly on resources available and the population being surveyed. The interviewers' workloads as well as the number and timing of calls upon sample members play an important role in reducing non-contact. Thirdly, some sample members will be unwilling to participate; and finally some sample members will be unable to participate because they are too ill or infirm, deaf or unfamiliar with the language in which the survey is conducted. The distinction between these categories of non-response in practice is not that clear, but what is evident is an increase in overall non-response in surveys. It is reported by most survey organisations that response rates are lower now than they were 20 years ago. This is often attributed to increased respondent resistance to surveys, however D Lievesley (1988) suggests that changing living patterns as well as increased suspicion of all strangers are elements that play an important role in non-response. Further evidence of an increase in non-response is the higher refusal rates found in continuous/repeated surveys in the U.S. National Election Studies from 1952-1978. In Britain, OPCS response rates for the General Household Survey, Labour Force Survey, and National Readership Survey, have all fallen. It is difficult to identify a trend in response rates for ad hoc surveys since fluctuations may be due to the characteristics of particular surveys rather than changes in response rates. Taking this into consideration, an aggregated response rate for all Social and Community Planning Research ad hoc surveys between 1978 and 1985 shows that both refusal and non-contact rates were rising over time. These findings suggest that non-response bias is increasing in surveys and strategies are needed to overcome it.

2.2 Reducing Unit Non-response Bias Through Imputation and Weighting

By collecting data on the characteristics of non-respondents, it is then possible to make adjustments using imputation and weighting to compensate for non-response bias. Such adjustments have been documented by Elliot (1995) who has developed population-based weighting methods. One form of data available on non-respondents are aggregate population data, which can reveal whether the sample distribution differs from the population distribution by a margin greater than one would expect, assuming random selection. If these differences are due to non-response bias, then adjustments can be made. It must, however, be clearly shown that the differences are not due to errors in sampling frame coverage, definitional differences, or measurement errors. Individual level data from external sources for both respondents and non-respondents can be obtained. Data on regional distribution of the sample members is available from the sampling frame. These data provide only information on limited variables such as age, sex, and marital status; occasionally individual level data are available for a more extensive range of variables. OPCS have extracted census data relating to the samples selected for the General Household, Family Expenditure, and Labour Force Surveys in 1981. These plus the OPCS mid-year population estimates are valuable sources of information that can be used in reducing non-response bias.

Another form of data available are individual level data from internal sources; this is information collected by interviewers when they call, for both respondents and non-respondents. These data will only be possible for a few variables, so other measures like follow-up studies are necessary. These studies rarely achieve complete participation and thus cannot give much insight on the presence or absence of non-response bias; imputation or weighting measures are therefore difficult to implement. Another way of identifying characteristics of non-responders is through wave data. Dunkelberg and Day (1973) argue that respondents range along a continuum from highly motivated to unmotivated individuals. Each wave digs deeper into non-respondents and so is indicative of the direction and extent of non-response bias which can be adjusted for later.

If the characteristics of predominant refusers were known, then weighting or imputation could be used to overcome non-response bias. Lievesley (1988), however suggests that these sorts of refusers do not exist. After re-calling on all refusers to an attitude survey on current affairs, to talk to them about their reasons for refusals, it was discovered that many of refusals are situational; that is, the result of an interviewer calling at an unfortunate time rather than a reflection of an underlying antipathy towards surveys. This makes it even harder to identify a group of non-responders and overcome non-response bias through statistical measures. It must be pointed out that there is a strong argument that particular groups are consistently under-represented in survey research. In Britain these groups include single person households, those in lower social groups, the less educated, the self employed, and those in specific regions (with the south east having the lowest response rate).

2.3 Reducing Non-response Bias by Minimising Refusal Rates

One strategy for reducing non-response bias is to minimise refusals. This can be achieved by training interviewers on the door-step approach so that they can overcome respondents reluctance and successfully conduct the required interviews. In fact each door step situation is a unique fast-moving, interactive process for which interviewers require a high degree of social skill; for this it is not possible to write precise rules which can be easily taught in training sessions. This aspect of interviewer training was looked into by Morton-Williams (1993). Having analyzed tape recordings of door-step introductions, in-depth interviews with respondents about their reaction to the interviewers, and group discussions with interviewers and supervisors about approaching people for interviews, she concluded that the best training in door-step introduction should include, first, a good survey introduction which is clear, coherent, and delivered with confidence. It should not be

scripted to allow the interviewer spontaneity and flexibility. Second, the interviewer should be able to judge when to withdraw and return another time. Third, persuading reluctant respondents was best done by pre-empting resistance through the manner of the initial introduction, by listening carefully and addressing the expressed reluctance briefly and directly. It is also important to emphasise the positive aspect of taking part, stressing that the survey is interesting and important as well as being a pleasant experience. It is also helpful to appeal to the altruistic feelings of the people contacted, by asking for their help with respondent selection procedure and with the survey. It can be concluded that the most important part of any training should encourage interviewers to give reassurance, to be positive about the benefits of taking part, appeal to altruism, and to give a good first impression. There are other aspects, such as advance letters, incentives to respondents, interview length, incentives to interviewers, that can reduce refusals but it must be emphasized that interviewers play an important role in preventing refusals and therefore also non-response bias.

Another approach might be to improve the success rate for re-issue. This process occurs when a proportion of people who initially refuse or seem reluctant to participate can later be persuaded to change their minds and therefore are reissued to another interviewer. The problem is to distinguish the most effective way of reissuing; one way is to ask interviewers to record for each refuser how likely they think it is that the person would participate if a different interviewer called back in a few weeks. The alternative way would be to reissue all refusers that supervisors thought "convertible" from notes given by the interviewer. Lievesley (1988) reports on an experiment conducted using both these methods and concludes the most productive way would be to collect interviewers' assessments of the likelihood of conversion for all refusers and to use this in conjunction with a judgement by supervisors. Purpose designed conversion letters can also be sent out before the second interviewer attempts the interview. These letters can be general or aimed at a specific groups; for example, those who refused because of old age would be sent a letter explaining how useful the survey is for the elderly.

2.4 Reducing Non-Response Bias by Minimising Non-contact Rates

A large proportion of research concerning non-response has been confined to refusals and has overlooked the importance of reducing non-contact and its impact on non-response bias. The little research which exists on non-contacts shows that non-contact rates vary between areas and interviewers. Very little has been published about reduction of non-contact rates between areas but reputable survey organisations implement particular strategies for different areas. Generally, inner city areas produce the most non-contacts; therefore, in these areas it is not uncommon for interviewers to have their work load reduced by using two interviewers. Rural areas can also have high non-contact rates because addresses are hard to find; remedies for this include providing interviewers with some Ordnance Survey grid references and instructions on how to use an Ordnance Survey map. If interviewers still have problems locating hard-to-find addresses, they are instructed to ask local people, the police, the local post office or sorting office and finally to check the electoral register. Differences in non-contact rates between interviewers have mainly been explained by the way that interviewers organise their work. The most important aspect is the time when they make calls; all the research suggests that the best time to call is in the evenings and during weekends. A reduction in non-contact rates could also be achieved by helping interviewers plan what time to make calls by giving them feedback on research about optimum times to find people at home. Survey organisations could also impose greater control by ensuring interviewers should call at addresses a minimum of four times at different times of the day and on different days of the week, at least two of the calls being in the evenings or on weekends. Classifying interviewers' calling patterns may also help in determining an efficient re-issuing policy and help in designing non-contact letters encouraging respondents to contact interviewers suggesting the best time to call. The

ultimate aim of these measures is to reduce non-contact and to eliminate interviewer effect on the non-contact rates.

2.5 Non-response Bias in Longitudinal Studies

Longitudinal studies in their first wave face similar problems of non-response bias to those which cross-sectional studies encounter. In future waves, the problem of non-response bias is reduced because certain respondent variables are already known about statistical methods of imputation and weighting that can be employed. These statistical techniques are insufficient to address the type of non-response known as attrition; other methodological strategies are needed to prevent subject attrition. The methodological strategies developed include "subject bond" with the study which can be developed by creating a logo and theme which respondents can relate to, which can be used on letters, envelopes, gifts, and questionnaires. Communication with respondents is also very important and the sending of Christmas cards, birthday cards, and reports on the study, have been used. The access and continuity of respondent contact with the fieldwork agency is important, in particular the continuity of interviewers across waves. Maintaining the same interviewer over waves increases the likelihood of establishing trust, as does the availability of a free phone number for respondents to contact the survey researchers. Expressions of appreciation through gifts and incentives is common practice in longitudinal studies, bearing in mind the time and effort expended by respondents. A good tracking procedure for movers is essential and large longitudinal studies usually incorporate a panel maintenance unit for this purpose; this unit holds names and addressees of contact people respondents have given in the first wave. If the respondent then moves and is not traceable, the unit will approach the contact names for further information on the whereabouts of the respondent. Other methods can be used such as providing names and addressees of untraced respondents to the Department of Social Security, who provide a cheap service that will forward correspondence to the last known address.

2.6 Other Methods of Reducing Non-Response Bias

As the debate on whether there is a group of definite refusers or if some of these are situational refusers continues, no further explanation has been put forward in recent studies. The British Household Panel Study (BHPS) are at present experimenting with different ways of reducing the level of definite refusers. The present structure for dealing with refusals adopted by BHPS through its fieldwork agency is that both household and within-household refusals are passed on from the interviewer to a supervisor for "conversion". The supervisor reviews all such returns on a case-by-case basis and attempts conversion, wherever the refusal seems relatively weak. The supervisor judges whether it would be helpful to send a refusal conversion letter (provided by BHPS) or more appropriate to "call blind". Those households where no conversion is attempted or a conversion is not successful are referred back to BHPS as definite refusers. The notes provided about these refusers by supervisors and interviewers are reviewed by BHPS staff in order to determine that the supervisors are making reasonable conversion efforts. If any households are identified as possible conversions by BHPS staff, they are then subject to a different form of conversion initiated by BHPS. This process takes place in different forms; first, where all members of the household have refused, they are sent a letter with an additional advance incentive, re-iterating the importance of the survey and requesting an interview, at the respondent's convenience. This is followed by a telephone call from a trained interviewer employed by BHPS, who attempts to make an appointment for an interview. Those households agreeing to be interviewed are then re-issued back to the fieldwork agency. Those households not having a telephone are sent a freepost card to send back if they do not want to be interviewed; any households not sending this card back are

automatically re-issued to the field work agency. A third category of this conversion process is that the BHPS interviewer "rings cold" to refusers without any advance incentive or letter. The results of this exercise shows a very encouraging 25% conversion rate on respondents regarded as definite refusals, with a further 6% saying they will participate in Wave Three. These results may well provide support for the argument that there are more situational refusals than definite refusals.

2.7 Concluding Remarks on Non-response

Having outlined non-response and ways of minimising it (thereby reducing the effect of non-response bias) and having identified the causes of non-response to which survey fieldwork procedures have to adapt, the next step will be to relate this information to the surveys being used in the research.

2.8 Cross-national Comparative Research

There are no easy or straightforward entries into cross-national comparative research; all the theoretical and methodological difficulties of social research still linger. The problems are likely to increase in comparative research with the introduction of another analytical level into the social investigation. Even given this prospect, the amount of cross national comparative research is increasing. There are many explanations for this; among them the new possibilities opened up by cross-national research to examine unexplained variance and to find patterns and relationships. This could be based on a study from a single nation, and the validity and interpretations can be developed from equivalent studies in other nations. If this is possible, then social research stands to gain from the extended development of cross-national research.

2.9 What is Comparative Social Research

Many interpretations have been put on comparative social research with Oyen (1990) summarising the extensive literature and identifying four key approaches to the conduct of cross-national studies:

First, conducting comparative research across national boundaries is no different from any other kind of social research. In this situation, there is no need for discussion of problems encountered in cross-national studies but rather only of theoretical and methodological issues that are necessary for conducting multi-level research.

Second, cross-national researchers pursue their ideas and data across national boundaries without considering the possibility that such comparisons may well add to the complexity in interpreting the results of the study.

Third, cross-national research is carried out ignoring the many stumbling blocks of the non-equivalence of concepts, that is, many unknown variables interacting in an unknown context and influencing the research being carried out. This type of approach will also ignore the scientific requirements regarding the testing of the hypotheses in settings which do not and cannot meet the conditions for such testing.

Finally, there are those who carry out comparative research taking on board the arguments of the first and third group but claim that advancement of cross-national research involves distinctive characteristics of comparative studies.

Although there is much disagreement on the aims and theoretical framework for cross-national social research, it is generally accepted that the basic rules of scientific analysis must be applied; that is, the construction of concepts and typologies which can have links between data and theory.

2.10 Difficulties Within Comparative Research

Accepting that comparative research across nations has a role in verifying social theory, one must examine the present state of social theory. Nowak (1989) argues that the development of social theory has been neglected and the way social theory is formulated today makes it difficult for empirical verification of hypotheses or theorems. Given this, the key element of comparative research is missing and more emphasis should perhaps be put on developing social theory rather than cross-national research.

Quantitative cross-national comparisons have become common as more data are available; however, not much has been documented about the quality of the data for comparisons. There is also the problem of selection of countries; the countries selected for comparisons should be variance reducers (that is, the variance within them is less than among them). This can be illustrated by the fact that GNP per capita in some countries has greater variance within that country by region, than between it and many other countries. Another problem within a country is its ability to vary the issues being compared; an example often used is the case of a country which has no armed forces and is therefore incapable of threatening others, but should not necessarily be viewed as having peaceful behaviour. Cross-national comparisons can be heavily influenced by the point-of-time when the comparisons are being made. If these are different in each country, then there are problems of aggregation and disaggregation; it is also true that different years and time intervals may represent different things for some countries (for example, increasing social expenditure before an election).

From the evidence presented, it can be assumed that selecting points of time and countries should be theoretically justified; however, the theoretical design of the comparative study should include sufficient data to investigate the obvious explanations when the theory does not hold for a country. An example of this is seen in the controversial theory according to which increased social protection expenditure in western European countries leads to higher unemployment in those countries. Sweden has one of the highest social protection expenditures but one of the lowest unemployment rates; the explanation for this lies in the fact that in Sweden the initiatives provided by the state for the unemployed enables them to participate in the workforce, thus allowing the unemployment rate to remain lower than in other European countries. Without a good comparative research design incorporating adequate data, it would not be possible to successfully analyse this concept.

To have a good theoretical understanding of differences in countries, it is necessary to take into consideration the contextual systems of the country. Behaviour can be determined by the institutional, social and political systems of that country, which may well have different influences and theoretical meanings from the systems of other countries.

The problem of equivalence is highlighted when doing cross-national comparisons; it is not always possible to be confident that comparisons across countries are measuring the same thing or indicating something equivalent. When looking at attitudes and values, these might well be influenced by the system or culture in the country or even the situation at the time (for example, after a major event). Asking the question, "What are your beliefs in god?" could have very different interpretations between countries depending on their cultures. Contextual insight is needed in studying crime rates, socially disturbing behaviour, political voting, and so on. Other rather

straightforward measures like income have to be adjusted using equivalence scales or set to purchasing power parities or even the price level index. A way around problems of equivalence which is commonly used is to compare relationships such as structural change and unemployment within a region over time. To gain a greater theoretical grounding, comparisons of the whole systems of a country can be examined; this is possible when looking at, for example, immigration policies and GNP. It is also possible to look at system-specific indicators like tax incentives and foreign investment.

2.11 Using Cross-national Comparative Research to Study Panel Attrition.

What has been presented so far tends to support a rather pessimistic assessment of cross-national research; however, many studies have managed to use cross-national methodology to positive effect. These positive aspects are easily applied to the study of panel attrition. This can be demonstrated by, first of all the choice of variables for the study. The variables consist mainly of data that can be made compatible, such as age, sex, employment status, and household tenure. Secondly, the theoretical considerations do not impose great complexity to the study, because there is no elaborate social theory; this involves only a simplistic examination of panel attrition which is not necessarily influenced by the shortfalls of cross-national comparative research. There is the possibility that contextual and cultural effects may influence respondent participation in surveys. This has been illustrated by the German Household Panel Study, (User's Guide for German Social Economic Panel 1994) who extended their survey to include the former Eastern Germany after unification. It was discovered that former Eastern Germany had a significantly higher response rate than West Germany. The reason put forward for this was that former Eastern Germans found the panel study a new and interesting concept from the west and therefore showed much more enthusiasm for the study; it will be interesting to see how long this will last. Other affects may well include the issue of confidentiality; recently there has been resistance to providing information about oneself that is stored on computer. This was seen during the last German census and is reflected in the reluctance in the UK for the introduction of identity cards similar to those of other European countries. The level of resistance to provide some information for the use of surveys and censuses is hard to quantify and will vary between countries. For the purpose of making comparisons within longitudinal studies, it is accepted that, in the first wave of the study, there may be respondents who definitely refuse but are unidentifiable. One can also assume that these respondents may vary in their characteristics between countries. Having established this and using the simplistic theoretical assumption that it is the characteristics of the respondents that will determine the probability of them remaining in the longitudinal survey after Wave One, and not national differences, it is then possible to measure those characteristics. If contextual or cultural effects have any influence, then they should manifest themselves in the results because four countries are being examined and if one country's results greatly differ from the other three then the results need to be examined for national differences.

What is very important for any cross-national comparison, and particularly that of panel attrition, is the availability of compatible and standardised data. Such data are unfortunately hard to find although there are a small number of compatible databases containing data on Germany, France, Luxembourg, and the UK, which might be appropriate; among these are:

2.12 Luxembourg Income Study (LIS) - Luxembourg Employment Study (LES).

The Luxembourg Income Study was the first major comparative database set up by CEPS/INSTEAD in 1983. The main principle behind LIS was the harmonising of social and economical variables collected by national statistical offices from household expenditure and budget

surveys. The project has now collected three waves of cross-sectional data from more than 20 countries in Europe, North America and Australia covering a period between 1968 to the 1990s. LIS provides researchers with anonymous data ensuring respondents cannot be identified; the data also complies with any confidentiality restrictions imposed upon it by national authorities and can therefore only be remotely accessed from different locations. The main components of LIS are income indicators at an individual, family and household level. The Luxembourg Employment Study (LES) is a new study being carried out by CEPS/INSTEAD and is run on similar principles to LIS. The main aim of LES is to aid researchers to carry out comparative studies on various issues which include unemployment, retirement, and investment in education. This is done by providing labour market data through various national labour force surveys carried out during the early 1990s. Both these comparative databases have overcome many methodological difficulties and have proved to be widely used by the scientific community throughout the world. They are, however cross sectional and therefore not appropriate for this study. However, another innovative major database has been identified which is the ideal tool for studying non-response and panel attrition.

2.13 Panel Comparability Project on Longitudinal Household Panel Studies (PACO).

The PACO database, a comparative micro-database, with national and regional panel data, has the most appropriate structure and content for analysing panel attrition. This is because it is longitudinal and has also overcome many of the problems researchers usually encounter when doing cross-national studies. One of the major difficulties of panel analysis is the heavy demand put upon researchers' time and skill. It takes a large amount of time to become familiar with panel data organisation and procedures for carrying out analysis; this is the case for one single panel but, if more than one panel study is used, then the difficulties increase considerably. PACO has attempted to overcome this and other difficulties of making data compatible by establishing data archive files of available panel data, and from these files creating the PACO data base by harmonising and standardising variables and therefore achieving compatibility and comparability of data.

The main variables contained in the PACO database are:

- Income variables
- Demographic variables
- Labour Force and Work history variables
- Education and Family background variables
- Housing variables
- Other variables (Domestic Time Use)
- Weighting variables
- Organizational (Link) variables

The primary advantages of using the PACO database can be summarised as follows: (a) the researcher has access to harmonized panel variables; (b) there is the possibility of accessing original variables; (c) there are standardized variable names, which are held in a common format and are created by, and can be analysed using, common software; and (d) they are stored in a relational database structure, (that is, storage as SPSSx system files).

The database also includes a meta-data bank, which contains a documentation system including information on original and standardised variables as well as institutional documentation on social benefits. Another important feature of the database is that it complies with all data protection laws. This is made possible by omitting names, addresses, birthdays and detailed geographical

information on the data files. There are no variables allowing identification of individuals and families. The final measure includes sub-sampling of data sets before any possible distribution.

The PACO Project At Present

PACO DATA ARCHIVE

Country	Available years
Belgium	92
France	85-90
Germany	84-93
Hungary	92-94
Luxembourg	85-93
Poland	87-90
Sweden	84, 86, 88, 91
USA	68-88
UK	91-93

Expected PACO Database December 1995

Country	Available years
France	85-90
Germany	84-93
Luxembourg	85-93
USA	83-87
UK	91-93
Hungary	92-94
Poland	87-90

Future PACO Database Will also include

Czech Republic
Belgium
Sweden

Countries chosen for this study of panel attrition were those which were in the most complete form within the PACO database; that is: France, Germany, Luxembourg, UK. Any analysis can be adapted very easily for the remaining countries once the PACO database is fully completed.

GERMANY - Household Panel Study

SOEP: Sozio-Oekonomisches Panel / Bundesrepublik Deutschland

The initial sample for SOEP consists of two sample groups; one of these is a German sample group (sample A). The sampling procedure was a random route sample drawn from the address pool of Infratest Sozialforschung (Munich), the company which conducts the fieldwork. The sample population included all persons who are allowed to live in Germany in a household with the head of household or reference person having a nationality other than Greek, Turkish, Yugoslav, or Spanish. The second sample group was a foreigners sample (sample B), with the sampling procedure being a disproportional sampling of 400 Turkish, 300 Yugoslav and Italian and 200 Greek and Spanish residences. The reference population for this group was all persons allowed to live in Germany in a household with the head of household or reference person having Greek, Turkish Yugoslav, Italian or Spanish nationality. Individuals without a registered address (for example, the homeless) are not sampled. The method of data collection was a face-to-face interview with a few rare cases of self-completion or telephone interview. Two questionnaires were administered, one questionnaire for each household and one for each individual. The time taken to interview a one person household was approximately 45 minutes and for households with more than one person an additional 30 minutes for each additional adult person.

Longitudinal Response Rate (household and individuals interviewed in all three waves)

	Wave 1	Wave 2	Wave 3
Households	5921	5184 (87.6%)	4680 (79.0%)
Individuals	12245	10563 (86.3%)	9485 (77.5%)
Individuals in our analysis excluding under 18s	11957	10312 (86.2%)	9253 (77.5%)

Response rates for Wave One have full coverage of all households and all adult members. From Wave Two, households that are only partially covered are included, that is, when not every adult member of the household is interviewed. From Wave Two, proxy interviews for adult members of the household who were unable to be interviewed are also included; information was obtained on them through a proxy interview with another adult member of the household.

LUXEMBOURG - Household Panel Study

PSELL: Panel Socio-economique Liewen zu Letzeburg / Luxembourg

The sample design is one of a simple random sample of persons drawn from a register from the Inspectorate General for Social Security. The reference population includes anyone living in the Grand Duchy of Luxembourg who is covered by social welfare or social protection; this represents 97 per cent of the population living in Luxembourg. Those not included in the sample are: foreign residents who have no links with the country's social security system, or who do not live in a household where at least one member is linked with the social security system. Elderly persons living in a collective household such as an old peoples homes are also excluded. The method of data collection is a face-to-face interview carried out by interviewers specifically trained and employed by CEPS/INSTEAD for the survey. Three questionnaires are administered, which include household, individual and group questionnaires. The time taken to interview a one person

household is approximately 45 minutes and for household with more than one person an additional 25 minutes for each additional adult person and a further 10 minutes for any additional group questionnaire administered.

Longitudinal Response Rate (household and individuals interviewed in all three waves)

	Wave 1	Wave 2	Wave 3
Households	2012	1713 (85.1%)	1507 (74.9%)
Individuals	6110	5176 (84.7%)	4507 (73.8%)
Individuals in our analysis excluding under 18s	4881	4092 (83.8%)	3538 (72.4%)

UK - British Household Panel Study

BHPS: British Household Panel Study

The initial sample for the BHPS was drawn by using a two-stage cluster probability design and systematic sampling. The frame used for the selection of sample units was the Small Users Postcode Address File (PAF) for Great Britain south of the Caledonian canal (and excluding Northern Ireland). For the first stage of selection, 250 postcode sectors were selected as the primary sampling units (PSUs) from an implicitly stratified listing of all sectors on the PAF using a systematic sampling method. For the second stage of selection, delivery points, which are approximately equivalent to addresses, were sampled from each selected PSU using an analogous systematic procedure. The Post Code Address File containing private addresses only was used and therefore only the non-institutionalised population is covered. The fieldwork was carried out by National Opinion Poll (NOP), and the questionnaire package included: household coversheet, household composition form, household questionnaire and individual schedule. The time taken to interview a one person household was approximately 60 minutes and for households with more than one person an additional 40 minutes for each additional adult person.

Longitudinal Response Rate (household and individuals always interviewed in the three waves)

	Wave 1	Wave 2	Wave 3
Households	5538		
Individuals	10264	8718 (87.9%)	7984 (80.6%)
Individuals in our			

analysis excluding under 18s	9915	8673 (87.4%)	7905 (79.7%)
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Response rates here include households that are only partially covered, that is, when not every adult member of the household is interviewed. The response rates also include proxy interviews for adult members of the household who were unable to interview but information was obtained about them through a proxy interview from another adult member of the household.

FRANCE - Lorraine Household Panel Study

ESEML: Etude Socio-Economique des Menages en Lorraine / France

A very simplified description of the sampling for the ESEML would be: random sampling for the residents of the Lorraine region; therefore the panel is representative of Lorraine and not France, making it a regional panel. The population coverage included households described as 'ordinary' and excluded households in collective institutions such as hospitals, foreign workers' centres, and psychiatric institutions. The Lorraine panel was established in conjunction with the Luxembourg panel so is similar in many ways except for the sampling and the first wave. In the Lorraine panel, the first wave was a pilot, from Wave Two additional households were introduced to the panel. Face-to-Face interviews were carried out; the questionnaire and time duration of questionnaires is similar to Luxembourg.

Longitudinal Response Rate for sample from Wave One (household and individuals always interviewed in the three Waves)

	Wave 1	Wave 2	Wave 3
Households	715		
Individuals	2609	2274 (87.1)	2029 (77.7%)
Individuals used in our analysis excluding under 18s and taken from Wave 1 sample	1705	1461 (85.7%)	1302 (76.4%)

CHAPTER 3 CROSS NATIONAL ANALYSIS

3.1 Analysis of the Longitudinal Household Panel Studies Using the PACO Database

To distinguish characteristics of non-respondents, 10 variables were examined for all four countries; in one or two of the variables, however, the data for the UK are not yet available in the PACO database. In order to keep French data compatible with the other countries in terms of analysis, the

initial sample from Wave One only is being used and not the additional sample added from Wave Two. Although this is a small sample, it is still representative of Lorraine and is possible to use for the study of panel attrition, even though it is methodologically different from the other three panels. This may result in, or account for, the possibility of the French panel having marginally different results from the other three panels. Unweighted data are being used for all the countries in order to examine actual loss of respondents in the panels, also the weighting system for each country is different and has not yet been standardised in the PACO database.

The ten variables that were used are: marital status, sex, age, country of birth, educational qualifications, employment status, professional status, total gross income, household size and type, and household tenure. This initial analysis measured, in simple frequencies, the numbers and percentages of respondents leaving the panel studies in the first three Waves.

The analysis of the panel studies was carried out on the PACO database using SPSS for Windows. The first stage of the analysis was to exclude all respondents below the age of eighteen years, to get greater comparability. In the Luxembourg panel, respondents still at school are not interviewed at an individual level; by eighteen, most individuals have left school or are about to leave school and are therefore interviewed at an individual level. For the other panels, all individuals over the age of 16 are interviewed but for the purpose of comparisons here only individuals 18 years or above are being considered. A look at the tables above shows very little variation in the sample group being analysed and the original sample group. It does however indicate in percentage terms that attrition for respondents under eighteen years old is higher than respondents over eighteen years old for all countries. It should be pointed out that in the French, German and Luxembourg panels, data are collected by proxy for under 16 year olds and they will become participating members of the panel when they reach 16 years old, and are therefore included in the PACO database.

The results of the analysis are entered into similar tables; as an example, Marital Status for France is given below.

MARTIAL STATUS RESPONDENTS INTERVIEWED AT W1 OR W1+ W2 OR W1+W2+W3

	Wave 1 response interview at Wave 1	Wave 2 stayers interview W1+W2	Wave 3 stayers interview W+W2+W3	Wave 1 original status outcome at W3	total leavers between W1 to W3	leavers with original status between W1 and W3
France	P= 7.51	DF 4	SIG .057			
married	1186 69.9%	1084 74.2%	981 75.3%	963 74.0%	205 17.2%	223 18.8%
separated	12 .7%	9 .6%	7 .5%	5 .4%	5 41.6%	7 58.3%
single	405 23.8%	282 19.3%	233 17.9%	270 20.7%	172 42.4%	135 33.3%
divorced	33 1.9%	26 1.8%	25 1.9%	20 1.5%	8 24.2%	13 39.3%
widowed	69 4.0%	60 4.1%	56 4.3%	44 3.4%	13 18.8%	25 36.2%
	1705 100%	1461 100%	1302 100%	1302 100%	403	403
	A	B	C	D	E	F

Only respondents who have been interviewed in all three waves are examined; therefore, the numbers in the first column (A) should be the highest. This is because these are all the respondents interviewed in Wave One. Column (B) contains all the respondents who were initially interviewed at Wave One and also at Wave Two. Column (C) contains all respondents interviewed at Wave One, Wave Two and Wave Three. There are no additional respondents who were interviewed in

all three waves (for example, no new entrants). Column (D) contains those respondents found in column (C) but with their original Wave One status, for example, if we are using the variable Marital Status, then those who are coded as married in Wave Three might have been single in Wave One; their original status would therefore, be single at Wave One. Column (E) shows the total number of respondents leaving the surveys between Wave One and Wave Three (simply A-C, for example). In the above table there were 69 widows at Wave One but by Wave Two there were 60 and by Wave Three there were 56 therefore, a loss of 13 respondents coded widowed in any of the Waves. Column (F) shows the number of respondents leaving between Wave One and Wave Three as in column E but keeping their original status from Wave One, (again simply A-D). From the above table, there are 13 respondents coded widowed in column (E) and they represent 18.8% of the 69 widows coded in column A. The difference between the 13 widowed respondents in column (E) and the 25 widowed respondents in column F is that the 25 widowed respondents in column F had original codes of widowed in Wave One; therefore 36.2% of the Wave One widowed have left the sample in Wave Three. The 13 widowed respondents in column (E) are made up of the number of widows who have left by Wave Three but also adding those respondents who have changed status between Wave One and Wave Three from one of the other four categories and have become widowed.

The Pearson chi-squared value is calculated by cross tabulation of the actual response rate in Wave One (which is found in column A) and the response rate or retention rate for those respondents in Wave 3 (found in column D). This is reported with the degrees of freedom and observed significance level; in the case above, for France the Pearson is equal to 7.51 with 4 degrees of freedom and an observed significance level of .057. The observed significance level is just marginally greater than the 0.05 level which is being used to test for significance; therefore the French Marital Status figures are not quite significant using a strict interpretation of the 0.05 level.

3.2 Analysis of Marital Status

This was the first variable to be examined and was harmonised into five categories: married, separated, single, divorced and widowed. The married category contains only those legally married and not cohabiting couples. The major literature based on this variable is taken from a review by (Elliot 95) of the seven census comparison studies. This is a comparison of census data for respondents and non-respondents to the OPCS continuous household surveys, undertaken following the 1971 and 1981 censuses. These comparisons were made using the General Household Survey, Family Expenditure Survey and the National Food Survey using both 1971 and 1981 census data, and on the Labour Force Survey using 1981 data only. The results from this study using heads of household showed significant association for the married with response in six of the seven studies. This is also found in most panel studies and is reflected in our figures from the table on marital status for all the countries. In terms of non-response, the UK census comparison did not find such conformity with four of the studies reporting significantly low response for single head of households and two of the studies recording low response from divorced and widowed heads. For this variable no real conformity was found in panel studies; never married or separated were the most likely to leave in the panel in Survey of Income and Program Participation (McArthur and Short 1985), American Changing Lives (Kalton et al 1990), National Longitudinal Survey of Labour Market Experience (Rhoton 86) while in The Panel Study of Income Dynamics (Duncan et al 1986), the single and separated were the most likely to leave the panel. The Panel Study of Social Attitudes in Britain (Waterton and Lievesley 1987) suggests the widowed are most likely to leave the panel. In our comparisons (under the column total leavers from Wave One to Wave Three), all countries show the highest percentage of attrition among single persons. This is not the case when looking at the "leavers with original status between Wave One to Wave Three," where only the UK still shows single persons most likely to leave the panel. This suggests that single

persons in panel studies are not the most likely to leave the panel but remain in the panel under a different status (which may well be "married"). The results when comparing the four countries also indicate that there is no definite group within this variable that is subject to attrition, which to an extent coincides with the literature.

3.3 MARTIAL STATUS RESPONDENTS INTERVIEWED AT W1 OR W1+ W2 OR W1+W2+W3

	Wave 1 response interview at Wave 1	Wave 2 stayers interview W1+W2	Wave 3 stayers interview W1+W2+W 3	Wave 1 original status outcome at W3	total leavers between W1 and W3	leavers with original status between W1 and W3
France	P= 7.51	DF 4	SIG .057			
married	1186 69.9%	1084 74.2%	981 75.3%	963 74.0%	205 17.2%	223 18.8%
separated	12 .7%	9 .6%	7 .5%	5 .4%	5 41.6%	7 58.3%
single	405 23.8%	282 19.3%	233 17.9%	270 20.7%	172 42.4%	135 33.3%
divorced	33 1.9%	26 1.8%	25 1.9%	20 1.5%	8 24.2%	13 39.3%
widowed	69 4.0%	60 4.1%	56 4.3%	44 3.4%	13 18.8%	25 36.2%
	1705 100%	1461 100%	1302 100%	1302 100%	403	403
Germany	P= 13.1	DF 4	SIG .004			
married	8418 70.4%	7448 72.2%	6811 73.6%	6715 72.6%	1607 19.0%	1703 20.2%
separated	226 1.9%	172 1.7%	167 1.8%	145 1.6%	59 26.1%	81 35.8%
single	2217 18.5%	1752 17.0%	1416 15.3%	1612 17.4%	801 36.1%	605 27.2%
divorced	315 2.6%	302 2.9%	279 3.0%	244 2.6%	36 11.4%	71 22.5%
widowed	781 6.5%	638 6.2%	580 6.3%	537 5.8%	201 25.7%	244 31.2%
	11957 100%	10312 100%	9253 100%	9253 100%	2704	2704
Lux	P= 3.93	DF 4	SIG .268			
married	2826 57.9%	2447 59.8%	2166 61.2%	2116 59.8%	660 23.0%	710 25.1%
separated	53 1.1%	50 1.2%	38 1.1%	42 1.2%	15 28.3%	11 20.7%
single	1376 28.2%	1088 26.6%	880 24.9%	971 27.4%	496 36.0%	405 29.4%
divorced	117 2.4%	99 2.4%	88 2.5%	76 2.1%	29 24.7%	41 35.0%
widowed	509 10.4%	408 10.0%	366 10.3%	333 9.4%	143 28.0%	176 34.5%
	4881 100%	4092 100%	3538 100%	3538 100%	1343	1343
UK	P= 6.05	DF 4	SIG .108			

married	6041 60.8%	5385 61.8%	4991 63.1%	4952 62.5%	1050 17.3%	1089 18.0%
separated	202 2.0%	175 1.9%	152 1.9%	157 2.0%	50 24.7%	45 22.2%
single	2197 22.1%	1752 21.2%	1467 18.5%	1649 20.8%	730 33.2%	548 24.9%
divorced	599 6.0%	562 6.0%	539 6.8%	472 6.0%	60 10.0%	127 21.2%
widowed	876 8.8%	799 8.8%	756 9.6%	675 8.5%	120 13.6%	201 22.9%
	9915 100%	8673 100%	7905 100%	7905 100%	2010	2010

3.4 Analysis of Gender

The gender variable is very straightforward with a male and female category. In the comparative table the columns "total leavers between Wave 1 and Wave 3" and "leavers with original status between Wave 1 and Wave 3" are identical because none of the panels experienced any sex changes amongst their respondents; therefore there is no change of status. From the literature we find that where, figures are presented, in all cases males are more likely to have a higher non-response rate and significantly so in the studies of Kalton et al (1990) and McArthur and Short (1985). From the comparative table, we find for three of the countries males having a higher attrition rate; however, France has a marginally higher attrition rate for females of 0.4%. This is very small and could be put down to the fact that the numbers are smaller for France.

3.5 GENDER W1+W2+W3

RESPONDENTS INTERVIEWED AT W1 OR W1+ W2 OR

	Wave 1 response interview at Wave 1	Wave 2 stayers interview W1+W2	Wave 3 stayers interview W1+W2+W 3	Wave 1 original status outcome at W3	total leavers between W1 and W3	leavers with original status between W1 and W3
France	P= .006	DF 1	SIG .934			
male	846 49.6%	723 49.5%	648 49.8%	648 49.8%	198 23.4%	198 23.4%
female	859 50.4%	738 50.5%	654 50.2%	654 50.2%	205 23.8%	205 23.8%
	1705 100%	1461 100%	1302 100%	1302 100%	403	403
Germany	P= .065	DF 1	SIG .797			
male	5866 49.1%	5045 48.9%	4523 48.9%	4523 48.9%	1343 22.8%	1343 22.8%
female	6091 50.9%	5267 51.1%	4730 51.1%	4730 51.1%	1361 22.3%	1361 22.3%
	11957 100%	10312 100%	9253 100%	9253 100%	2704	2704
Lux	P= .155	DF 1	SIG .693			
male	2367 48.5%	1987 48.6%	1700 48.0%	1700 48.0%	667 28.1%	667 28.1%
female	2515 51.5%	2105 51.4%	1838 52.0%	1838 52.0%	677 26.9%	677 26.9%
	4882 100%	4092 100%	3538 100%	3538 100%	1344	1344
UK	P= 2.57	DF 1	SIG .108			
male	4636 46.7%	4005 46.2%	3596 45.5%	3596 45.5%	1040 22.4%	1040 22.4%
female	5298 53.3%	4673 53.8%	4314 54.5%	4314 54.5%	984 18.5%	984 18.5%
	9934 100%	8678 100%	7910 100%	7910 100%	2024	2024

3.6 Analysis of Professional Status

The professional status variable has eight categories: farmers, self employed, contributing family workers, blue collar workers, white collar workers, apprentice, civil servants and not applicable. At present there are no data available for the UK on this variable in the PACO database. In the literature, the UK census study used the Registrar General's Social Class definitions which are not compatible with the comparisons in this study. They did however find that in five out of six studies examining Socio-economic groups and response, low response was found amongst the self-employed. It is also difficult to compare this variable with other panel studies because of the categories used but from the figures in the studies there is no general pattern and no indication that the self-employed are most likely to be subject to attrition. Within the comparative table on professional status, no clear pattern emerges, this could be the case because the numbers are low (40% of the sample for the three countries are not applicable for this variable).

3.7 PROFESSIONAL STATUS Respondents interviewed at W1 or W1+ W2 or W1+W2+W3

	Wave 1 response interview at Wave 1	Wave 2 stayers interview W1+W2	Wave 3 stayers interview W1+W2+W3	Wave 1 original status outcome at W3	total leavers between W1 and W3	leavers with original status between W1 and W3
France	P= .795	DF 6	SIG .992			
farmers	21 1.2%	23 1.6%	21 1.6%	18 1.4%	0 0%	3 14.2%
self-empl	39 2.3%	40 2.7%	37 2.8%	31 2.4%	2 5.1%	8 20.5%
family	10 .6%	12 .8%	5 .4%	9 .7%	5 50.0%	1 10.0%
blue collar	373 21.9%	288 19.7%	259 19.9%	281 21.6%	114 30.5%	92 24.6%
white coll	214 12.6%	201 13.8%	177 13.6%	164 12.6%	37 17.2%	50 23.3%
apprentice	2 .1%	1 .1%	0 0%	2 .2%	2 100%	0 0%
civil serv	208 12.2%	194 13.3%	177 13.6%	172 13.2%	31 14.9%	36 17.3%
not applic	838 49.1%	702 48.0%	626 48.1%	625 48.0%	212 25.2%	213 25.4%
	1705 100%	1461 100%	1302 100%	1302 100%	403	403
Germany	P= 8.27	DF 6	SIG .218			
farmer	65 .5%	60 .6%	49 .5%	59 .6%	16 24.6%	6 9.2%
self-empl	461 3.9%	406 3.9%	388 4.2%	343 3.7%	73 15.8%	118 25.5%
family	75 .6%	75 .7%	60 .6%	57 .6%	15 20.0%	18 24.0%
blue coll	3402 28.5%	2874 27.9%	2590 28.0%	2585 27.9%	812 23.8%	817 24.0%
white coll	2194 18.3%	2034 19.7%	1839 19.9%	1801 19.5%	355 16.1%	393 17.9%
apprentice	492 4.1%	457 4.4%	411 4.4%	433 4.7%	81 16.4%	59 11.9%
civil serv	377 3.2%	261 2.5%	169 1.8%	280 3.0%	208 55.1%	97 25.7%
not applic	4891 40.9%	4145 40.3%	3747 40.6%	3695 40.0%	1144 23.8%	1196 24.4%
	11957 100%	10312 100%	9253 100%	9253 100%	2704	2704
Lux	P= 1.28	DF 6	SIG .972			
farmer	74 1.5%	54 1.3%	58 1.6%	59 1.7%	16 21.6%	15 20.2%
self-empl	147 3.0%	114 2.8%	107 3.0%	103 2.9%	40 27.2%	44 29.9%
family	49 1.0%	24 .6%	38 1.1%	31 .9%	11 22.4%	18 36.7%
blue coll	1179 24.1%	997 24.4%	864 24.4%	888 25.1%	315 26.7%	291 24.6%
white coll	864 17.7%	743 18.2%	702 19.8%	633 17.9%	162 18.7%	231 26.7%
apprentice	40 .8%	52 1.3%	21 .6%	30 .8%	19 47.5%	10 25.0%
civil serv	157 3.2%	135 3.3%	91 2.6%	124 3.5%	66 42.0%	33 21.0%
not applic	2372 48.7%	1973 48.1%	1657 46.9%	1670 47.2%	715 30.1%	702 29.5%
	4882 100%	4092 100%	3538 100%	3538 100%	1344	1344

3.8 Analysis of Nationality

This is another simple variable indicating whether the individual is "national" or "foreign national". At present there is no data for this variable available for the UK in the PACO database. It is not easy to compare this variable with the literature because most studies categorise in ethnic origin rather than nationality. The UK census studied examined country of birth in five of the studies, Three of the studies showed significantly low response for people born in the New Commonwealth and two showed the same low response rate for people born in Ireland. In all of the panel studies covering this type of variable, it was stated that non-whites have a significantly higher attrition rate than whites.

The panels are also carried out in countries that could be defined as 'white'. The table on Foreign Nationals clearly shows for the three countries that foreign nationals have higher attrition rates than nationals with the German results being significant.

3.9 NATIONALITY

Respondents interviewed at W1 or W1+ W2 or W1+W2+W3

	Wave 1 response interview at Wave 1	Wave 2 stayers interview W1+W2	Wave 3 stayers interview W1+W2+W 3	Wave 1 original status outcome at W3	total leavers between W1 and W3	leavers with original status between W1 and W3
France	P= .047	DF 1	SIG .822			
national	1443 84.7%	1327 90.8%	1186 91.1%	1118 85.9%	257 17.8%	325 22.5%
foreign	154 9.0%	134 9.2%	118 8.9%	116 8.9%	36 23.3%	38 24.6%
missing	108 6.3%			68 5.2%	108	40 37.0%
	1705 100%	1461 100%	1302 100%	1302 100%	403	403
Germany	P= 12.0	DF 1	SIG <.001			
national	8884 74.3%	7823 75.9%	7067 76.4%	7067 76.4%	1817 20.4%	1817 20.4%
foreign	3073 25.7%	2489 24.1%	2186 23.6%	2186 23.6%	887 28.8%	887 28.8%
	11957 100%	10312 100%	9253 100%	9253 100%	2704	2704
Lux	P= .152	DF 1	SIG .696			
national	3904 80.0%	3272 80.0%	2861 80.9%	2842 80.3%	1043 26.7%	1062 27.2%
foreign	977 20.0%	820 20.0%	677 19.1%	696 19.7%	300 30.7%	281 28.7%
	4881 100%	4092 100%	3538 100%	3538 100%	1343	1343

3.10 Analysis of Mean Income

This variable includes all income from all sources added together; for our purposes of comparing income categories, they have been derived, representing the mean income in the following categories: 0 = no income, 0 - .75 = from no income up to 75% of mean income, .75 - 1.50 = from 75% of mean income to 150% of mean income, > 1.50 = more than 150% of mean income. These categories represent crudely: no income; low income; average income; high income and have been derived in order to overcome the problem of making income comparable across different currencies and time periods. The mean income has been derived from the Wave one sample that was interviewed in all three Waves. From the literature, we find that (Kalton et al 1990), (Waterton and Lievesley 1987), (Duncan et al 1986) significantly conclude that attrition rates are higher for the lowest income groups and smaller for the highest income groups. The comparative table on mean income using the "leavers with original status" column reflects the literature, showing significantly for Germany and UK that attrition rates are highest amongst the no income group and lowest amongst the highest income groups. No such pattern exists for France or Luxembourg; however, when using the "total leavers column" we find the highest attrition rates amongst the "0 to .75" of mean income group for France, Luxembourg and UK, with Germany still having the highest attrition rate within the no income group. The German data tends to suggest that respondents changing status are moving upwards in the mean income distribution with the category >1.50 of mean income actually gaining respondents rather than losing. It can be argued that the overall pattern of the German data suggests that the higher the respondents' incomes, the less likely they are to leave the panel. Interestingly, in the UK, rather than having a loss of respondents in the lowest income group with the change of

status, they have an increase in respondents, a case of income mobility downwards for the UK panel.

3.11 % OF MEAN INCOME Respondents interviewed at or W1+ W2 or W1+W2+W3

	Wave 1 response interview at Wave 1	Wave 2 stayers interview W1+W2	Wave 3 stayers interview W1+W2+W3	Wave 1 original status outcome at W3	total leavers between W and W3	leavers with original status between W1 and W3
France	P= 1.11	DF 3	SIG .773			
0	651 38.2%	553 37.9%	501 38.5%	496 38.0%	150 23.0%	155 23.8%
0 - .75	226 13.3%	192 13.1%	146 11.2%	165 12.7%	80 35.3%	61 26.9%
.75 - 1.50	327 19.2%	273 18.7%	215 16.5%	238 18.3%	122 34.2%	89 27.2%
> 1.50	501 29.4%	443 30.3%	440 33.8%	403 31.0%	61 12.1%	98 19.5%
	1705 100%	1461 100%	1302 100%	1302 100%	403	403
Germany	P= 241	DF 3	SIG <.001			
0	4459 37.3%	3182 30.9%	2554 27.6%	2520 27.2%	1905 42.7%	1939 43.4%
0 - .75	2958 24.7%	2666 25.9%	2329 25.2%	2602 28.1%	629 21.2%	356 12.0%
.75 - 1.50	2736 22.9%	2359 22.9%	2195 23.7%	2445 26.4%	541 19.7%	291 10.6%
> 1.50	1804 15.1%	2105 20.4%	2175 23.5%	1686 18.2%	+371 20.5%	118 6.5%
	11957 100%	10312 100%	9253 100%	9253 100%	2704	2704
Lux	P= 1.52	DF 3	SIG .676			
0	1299 26.6%	1002 24.5%	835 23.6%	961 27.2%	464 35.7%	338 26.0%
0 - .75	694 14.2%	584 14.3%	428 12.1%	479 13.5%	266 38.3%	215 30.9%
.75 - 1.50	1613 33.0%	1300 31.8%	1059 29.9%	1148 32.4%	554 34.3%	465 28.8%
> 1.50	1276 26.1%	1206 29.5%	1216 34.4%	950 26.9%	60 4.7%	326 25.5%
	4882 100%	4092 100%	3538 100%	3538 100%	1344	1344
UK	P= 19.2	DF 3	SIG <.001			
0	511 5.1%	427 4.9%	561 7.1%	309 3.9%	+50 9.7%	202 39.5%
0 - .75	4859 48.9%	4148 47.8%	3530 44.6%	3808 48.1%	1329 27.3%	1051 21.6%
.75 - 1.50	2452 24.7%	2073 23.9%	1874 23.7%	2016 25.5%	578 23.5%	436 17.8%
> 1.50	2112 21.3%	2030 23.4%	1945 24.6%	1777 22.5%	167 7.9%	335 15.8%
	9934 100%	8678 100%	7910 100%	7910 100%	2024	2024

3.12 Analysis of House Ownership Status

The categories for this variable are: owner, tenant, and living rent free. The comparative table indicates for all countries that attrition rates are higher for tenants using the "leavers with original status between Wave 1 and Wave 3" column, with the German and UK figures being significant. Tenants also have the highest attrition rate for France, Luxembourg, and UK using the "total leavers between Wave 1 and Wave 3". These results that is, renters have significantly lower response rates, were also found by Kalton et al (1990), McArthur and Short (1985) and Waterton and Lievesley(1987). No pattern was found for this variable by the UK census study and it was not reported in the other studies.

	Wave 1 response interview at Wave 1	Wave 2 stayers interview W1+W2	Wave 3 stayers interview W1+W2+W3	Wave 1 original status outcome at W3	total leavers between W1 and W3	leavers with original status between W1 and W3
France	P= .735	DF 2	SIG .692			
owner	998 58.8%	872 59.8%	806 61.9%	773 59.4%	192 19.2%	225 22.5%
tenant	534 31.3%	440 30.2%	359 27.6%	390 30.0%	175 32.7%	144 26.9%
rent free	173 10.1%	147 10.1%	137 10.5%	139 10.7%	36 20.8%	34 19.6%
	1705 100%	1459 100%	1302 100%	1302 100%	403	403
Germany	P= 10.2	DF 2	SIG .006			
owner	4562 38.2%	4087 39.7%	3854 41.7%	3728 40.3%	708 15.5%	834 18.2%
tenant	7202 60.2%	6043 58.8%	5251 56.7%	5385 58.2%	1951 27.0%	1817 25.2%
rent free	193 1.6%	154 1.5%	145 1.6%	140 1.5%	48 24.8%	53 27.4%
	11957 100%	10284 100%	9250 100%	9253 100%	2707	2704
Lux	P= .888	DF 2	SIG .641			
owner	3565 73.1%	2963 72.5%	2601 73.8%	2593 73.3%	964 27.0%	972 27.2%
tenant	1123 23.0%	943 23.1%	775 22.0%	795 22.5%	348 30.9%	328 29.2%
rent free	190 3.9%	179 4.4%	148 4.2%	150 4.2%	42 22.1%	40 21.0%
	4878 100%	4085 100%	3524 100%	3538 100%	1354	1340
UK	P= 12.1	DF 2	SIG .002			
owner	6982 70.6%	6247 72.2%	5649 73.4%	5741 72.8%	1333 19.0%	1241 17.7%
tenant	2745 27.7%	2240 25.8%	1912 24.8%	2005 25.4%	833 30.3%	740 26.9%
rent free	159 1.6%	164 1.9%	128 1.6%	135 1.7%	31 19.4%	24 15.0%
	9886 100%	8651 100%	7689 100%	7881 100%	2197	2005

3.14 Analysis of Age

This variable was grouped into 4 categories: 18-30, 31-45, 46-60 and over 60. It was found, in the UK census study, that age was the individual variable showing the most consistent pattern across the seven studies and having a significantly low response rate for older people. The age at which non-response began to increase significantly varied between studies but the effect was apparent by age 56. This was also found by McDaniel et al (1987); reviewing American literature, they found seven references indicating high non-response amongst older respondents. Other studies reflecting this include Duncan et al (1984) who found, when using the age variable that the heavier losses in attrition were amongst older individuals, Waterton and Lievesley (1987) found significant attrition for the over 60s. The work of Paul and Lawes (1982) relating to the Canadian Labour Force Study, which uses a panel, found household size and age over 65 were the most significant factors in non-response. The results from Kalton et al (1990) show no significant variation in re-interview rate by age and McArthur and Short (1985) suggest that those aged between 15 and 24 years are the most likely to have left the sample. In the comparative table using the "leavers with original status between Wave One and Wave Three" column, we find Germany, Luxembourg and the UK showing the over 60's having the highest percentage of attrition with the German figures being significant. The French results are somewhat similar to those found by McArthur and Short (1985) with the youngest group having the highest percentage of attrition. The column "total leavers between Wave One and Wave 3" indicates for all countries that the 18 to 30 group are the most likely to leave the panels. This can

possibly be explained by the fact that they are the most likely group to leave in the French panel and the second most likely group to leave from the other panels, and with a change in status, this age group will have respondents moving up into the next group but with no respondents moving into this age group.

3.15 AGE

Respondents interviewed at W1 or W1+ W2 or W1+W2+W3

	Wave 1 response interview at Wave 1	Wave 2 stayers interview W1+W2	Wave 3 stayers interview W1+W2+W3	Wave 1 original status outcome at W3	total leavers between W1 and W3	leavers with original status between W1 and W3
France	P= 2.57	DF 3	SIG .462			
18 to 30	533 31.3%	396 27.1%	320 24.6%	374 28.7%	213 39.9%	159 29.8%
31 to 45	546 32.0%	496 33.9%	452 34.7%	440 33.8%	94 17.2%	106 19.4%
46 to 60	412 24.2%	373 25.5%	342 26.3%	327 25.1%	70 16.9%	85 20.6%
over 60	214 12.6%	196 13.4%	188 14.4%	161 12.4%	26 12.1%	53 24.7%
	1705 100%	1461 100%	1303 100%	1302 100%	403	403
Germany	P= 10.0	DF 3	SIG .018			
18 to 30	3402 28.5%	2690 26.1%	2196 23.7%	2592 28.0%	1206 35.4%	810 23.8%
31 to 45	3700 30.9%	3225 31.3%	2907 31.4%	2989 32.3%	793 21.4%	711 19.2%
46 to 60	2965 24.8%	2700 26.2%	2592 28.0%	2334 25.2%	373 12.5%	631 21.2%
over 60	1890 15.8%	1697 16.5%	1558 16.8%	1338 14.5%	332 17.5%	552 29.2%
	11957 100%	10312 100%	9253 100%	9253 100%	2704	2704
Lux	P= 5.26	DF 3	SIG .153			
18 to 30	1467 30.0%	1153 28.2%	941 26.6%	1074 30.4%	526 35.8%	393 26.7%
31 to 45	1215 24.9%	1042 25.5%	923 26.1%	925 26.1%	292 24.0%	290 23.8%
46 to 60	1246 25.5%	1096 26.8%	960 27.1%	914 25.8%	286 22.9%	332 26.4%
over 60	954 19.5%	801 19.6%	714 20.2%	625 17.7%	240 25.1%	329 34.8%
	4882 100%	4092 100%	3538 100%	3538 100%	1344	1344
UK	P= 7.54	DF 3	SIG .056			
18 to 30	2510 25.3%	1950 22.5%	1578 19.9%	1941 24.5%	932 37.1%	569 22.6%
31 to 45	2934 29.5%	2650 30.5%	2457 31.1%	2454 31.0%	477 16.2%	480 16.3%
46 to 60	2115 21.3%	1945 22.4%	1865 23.6%	1722 21.8%	250 11.8%	393 18.5%
over 60	2375 23.9%	2133 24.6%	2010 25.4%	1793 22.7%	365 15.3%	582 24.5%
	9934 100%	8678 100%	7910 100%	7910 100%	2024	2024

3.16 Analysis of Educational Qualifications

In this variable, the PACO database at present contains only educational qualifications reported in the first wave for France, Germany and Luxembourg; therefore change of status is not monitored, Column D is the same as Column C and Column F the same as column E. The UK PACO data has educational qualifications for each year; therefore change of status is monitored. This variable has been harmonised in the PACO database according to the OECD classification with four levels. For our purposes, and to make the data more compatible, level 1 and 2 have been combined; therefore giving us the following three levels:

First Level (primary and first stage):

Obligatory education in all countries and up to the end of obligatory education.

1st to 6th grade (Germany to 4th grade).

In most cases general education, (including in France, and other countries a so-called prevocational training, not really related to a specific occupation).

Second Level (second stage):

General education.

Preparation for university or third level education not directly leading to a profession. Technical /occupational/vocational education leading to occupational or group occupations. Apprenticeship.

Third Level (tertiary education):

University.

Technical College or Institute.

The UK census study examined educational qualifications in four of the surveys and found three showing a low response for people with no qualifications. This trend was also found by McDaniel (1987) with seven references to survey non-respondents being less well educated. In general the panel studies found, that those with fewer years of education were less likely to re-interview with Kalton et al (1990) finding a significant difference. In the comparative table for education, we find France, Germany and the UK all showing higher rates of attrition amongst the least educated, with Germany and UK having a significant variation. The reason for Luxembourg not following this trend may well be related to a methodological issue in the coding of the educational variable to the OECD classification and our further re-coding. The table indicates a high percentage of respondents falling in the first level and a very small percentage falling in the third level, indicating that Luxembourg have a lower educational level than the other countries; there is, however, no evidence to support this. There is also a small percentage of respondents falling into the not applicable category which may be educational levels that did not easily fit into the OECD classification this strengthens the argument that we are dealing here with a methodological inconsistency.

	Wave 1 response interview at Wave 1	Wave 2 stayers interview W1+W2	Wave 3 stayers interview W1+W2+W3	Wave 1 original status outcome at W3	total leavers between W1 and W3	leavers with original status between W1 and W3
France	P= .616	DF 2	SIG .734			
first level	851 50.4%	723 49.6%	638 49.1%	638 49.1%	213 25.0%	213 25.0%
second lev	623 36.9%	551 37.8%	497 38.2%	497 38.2%	126 20.2%	126 20.2%
third level	214 12.6%	183 12.5%	163 12.5%	163 12.5%	51 23.8%	51 23.8%
	1688 100%	1457 100%	1298 100%	1298 100%	390	390
Germany	P= 12.4	DF 2	SIG .001			
first level	3971 33.2%	3291 31.9%	2876 31.1%	2876 31.1%	1095 27.5%	1095 27.5%
second lev	6839 57.2%	5985 58.0%	5412 58.5%	5412 58.5%	1427 20.8%	1427 20.8%
third level	1147 9.6%	1036 10.0%	965 10.4%	965 10.4%	182 15.8%	182 15.8%
	11957 100%	10312 100%	9253 100%	9253 100%	2704	2704
Lux	P= .256	DF 2	SIG .879			
first level	2711 55.6%	2274 55.5%	1959 55.4%	1959 55.4%	752 27.7%	752 27.7%
second lev	1647 33.7%	1390 34.0%	1212 36.2%	1212 36.2%	435 26.4%	435 26.4%
third level	255 5.2%	207 5.3%	181 5.4%	181 5.4%	74 29.0%	74 29.0%
not applic	269 5.5%	221 6.4%	186 5.3%	186 5.3%	83 30.8%	83 30.8%
	4882 100%	4092 100%	3538 100%	3538 100%	1344	1344
UK	P= 8.30	DF 2	SIG .015			
first level	4099 41.2%	3472 40.0%	3072 38.8%	3137 39.6%	1027 25.0%	962 23.4%
second lev	3420 34.4%	2981 34.4%	2652 33.5%	2776 35.1%	768 22.0%	644 18.8%
third level	2168 21.8%	2120 24.4%	2114 26.5%	1855 23.5%	54 2.4%	313 14.3%
missing	247 2.5%	105 1.2%	72 1.0%	142 1.8%	175 70.8%	105 42.5%
	9934 100%	8678 100%	7910 100%	7910 100%	2024	2024

3.18 Household Size and Type

This variable has the following seven categories:

- 1 = Single man (1 person household)
- 2 = Single woman (1 person household)
- 3 = Couple (2 person household)
- 4 = Couple with children
- 5 = One parent family
- 6 = Three generation household
- 7 = Other household

In the UK census study, five out of seven studies using the household size and type variable found that single person households had significantly low response and the other two studies showed a similar pattern. There was also a significantly low response rates for two person households in three studies, and childless couples had significantly low response rates in three studies. The work of Paul and Lewis implies that household size is a more important factor than age for non-response. It was

not possible to compare this variable directly with other panel studies, however Duncan et al (1986) found low response rates with childless households and Waterton and Lievesley (1987) found significant attrition amongst pensioner households. From the comparative table on household size and type using the "leavers with original status between Wave One and Wave Three" column, we find that excluding other households, single men and women have the highest attrition rate's in France, Germany and Luxembourg while in the UK this category is exceeded by three generation households. An explanation for the UK results maybe that there are so few three generation households in the sample (only 2.1 %) and that this is, therefore, not an accurate representation in terms of attrition. From the "total leavers between Wave One and Wave Three" column, excluding other households we find for all countries that three generation households have the highest attrition rates. This implies that, within the panels, three generation households are considerably more likely to change status to other types of households than other types of households are to change status to three generation households.

3.19 HOUSEHOLD SIZE AND TYPE Respondents interviewed at W1 or W1+W2 or W1+W2+W3

	Wave 1 response interview at Wave 1	Wave 2 stayers interview W1+W2	Wave 3 stayers interview W1+W2+W 3	Wave 1 original status outcome at W3	total leavers between W1 and W3	leavers with original status between W1 and W3
France	P= 4.55	DF 6	SIG .602			
single man	15 .9%	14 1.0%	20 1.5%	9 .7%	+5 +33.0%	6 40.0%
single wo	43 2.5%	38 2.6%	35 2.7%	25 1.9%	8 18.6%	18 41.8%
couples	248 14.5%	264 18.1%	267 20.5%	213 16.4%	+19 +7.6%	35 14.1%
couples + ch	1190 69.8%	964 66.0%	843 64.7%	912 70.0%	347 29.1%	278 23.3%
one parent	63 3.7%	59 4.0%	43 3.3%	39 3.0%	20 31.7%	24 38.0%
three gen	80 4.7%	67 4.6%	43 3.3%	55 4.2%	37 46.2%	25 31.2%
other	66 3.9%	55 3.8%	51 3.9%	49 3.8%	15 22.7%	17 25.7%
	1705 100%	1461 100%	1302 100%	1302 100%	403	403
Germany	P= 11.1	DF 6	SIG .085			
single man	541 4.5%	471 4.6%	429 4.6%	372 4.0%	112 20.7%	169 31.2%
single wo	794 6.6%	708 6.9%	646 7.0%	580 6.3%	148 18.6%	214 26.9%
couples	2709 22.7%	2364 22.9%	2165 23.4%	2067 22.3%	544 20.0%	642 23.6%
couples + ch	6567 54.9%	5657 54.9%	5050 54.6%	5258 56.8%	1517 23.1%	1309 19.9%
one parent	535 4.5%	459 4.5%	404 4.4%	400 4.3%	131 24.4%	135 25.2%

three gen	433 3.6%	358 3.5%	312 3.4%	319 3.4%	121 27.9%	114 26.3%
other	378 3.2%	295 2.9%	247 2.7%	257 2.8%	131 34.6%	121 32.0%
	11957 100%	10312 100%	9253 100%	9253 100%	2704	2704
Lux	P= 3.60	DF 6	SIG .730			
single man	108 2.2%	100 2.4%	91 2.6%	72 2.0%	17 15.7%	36 33.3%
single wo	225 4.6%	187 4.6%	172 4.9%	151 4.3%	53 23.5%	74 32.8%
couples	769 15.8%	674 16.5%	593 16.8%	582 16.4%	176 22.1%	187 23.4%
couples + ch	2352 48.2%	1984 48.5%	1745 49.3%	1748 49.4%	607 25.8%	604 25.6%
one parent	315 6.5%	252 6.2%	215 6.1%	219 6.2%	100 31.7%	96 30.4%
three gen	488 10.0%	392 9.6%	283 8.0%	331 9.4%	205 42.0%	157 32.5%
other	625 12.8%	503 12.3%	439 12.4%	435 12.3%	186 29.7%	190 30.4%
	4882 100%	4092 100%	3538 100%	3538 100%	1344	1344 ...
UK	P= 9.30	DF 6	SIG .157			
single man	514 5.2%	488 5.6%	470 5.9%	397 5.0%	44 8.5%	117 20.4%
single wo	894 9.0%	804 9.3%	794 10.0%	707 8.9%	100 11.1%	187 20.9%
couples	2867 28.9%	2535 29.2%	2313 29.2%	2281 28.8%	554 19.3%	586 20.4%
couples + ch	4043 40.7%	3533 40.7%	3179 40.2%	3324 42.0%	864 21.3%	719 17.8%
one parent	501 5.0%	439 5.1%	407 5.1%	407 5.1%	94 18.3%	94 18.7%
three gen	206 2.1%	150 1.7%	149 1.9%	144 1.8%	57 27.6%	62 30.0%
other	909 9.2%	729 8.4%	598 7.6%	650 8.2%	311 34.2%	259 28.4%
	9934 100%	8678 100%	7910 100%	7910 100%	2024	2024

3.20 Employment Status

This variable has seven categories in the PACO database but the category of "under 16" is not used here leaving the following: student, working, unemployed, housewife, retired and other. The literature on employment status indicates, in general, that the unemployed are more likely not to respond than the employed. This was found to be significant in the study by Kalton et al (1990). It was also found in the UK census study that households where no one was employed had significantly low response in four out of five studies. The retired, sick and students were found to have significantly high attrition rates by Waterton and Lievesley (1987). The comparative table on employment status finds that

using the "leavers with original status between Wave One and Wave Three" column and excluding the other category, for all the countries the unemployed have the highest attrition rate, with it being significant for Germany. When using the "total leavers between Wave One and Wave Three", we find for all the countries that students have the highest attrition rate which is what we might expect because students are most likely to change their status.

3.21 EMPLOYMENT STATUS

Respondents interviewed at W1 or W1+W2 or W1+W2+W3

	Wave 1 response interview at Wave 1	Wave 2 stayers interview W1+W2	Wave 3 stayers interview W1+W2+W 3	Wave 1 original status outcome at W3	total leavers between W1 and W3	leavers with original status between W1 and W3
France	P= 5.43	DF 5	SIG .356			
student	84 4.9%	42 2.9%	29 2.2%	52 4.0%	55 65.4%	32 38.0%
working	864 50.7%	757 51.8%	675 51.8%	675 51.8%	189 21.8%	189 21.8%
unemploye d	127 7.4%	95 6.5%	77 5.9%	78 6.0%	50 39.3%	49 38.5%
housewife	344 20.2%	296 20.3%	289 22.2%	285 21.9%	55 15.9%	59 17.1%
retired	237 13.9%	227 15.5%	182 14.0%	180 13.8%	55 23.2%	57 24.0%
other	49 2.9%	44 3.0%	50 3.8%	32 2.5%	+1 0.0%	17 34.6%
	1705 100%	1461 100%	1302 100%	1302 100%	403	403
Germany	P= 192	DF 5	SIG <.001			
student	167 1.4%	156 1.5%	122 1.3%	136 1.5%	45 26.9%	31 18.5%
working	7091 59.3%	6220 60.3%	5751 62.2%	5579 60.3%	1340 18.8%	1512 21.3%
unemploye d	437 3.7%	460 4.5%	384 4.2%	305 3.3%	53 12.1%	132 30.2%
housewife	1117 9.3%	1055 10.2%	1048 11.3%	948 10.2%	69 6.1%	169 15.1%
retired	2029 17.0%	1800 17.5%	1566 16.9%	1856 20.1%	463 22.1%	173 8.5%
other	1116 9.3%	621 6.0%	382 4.1%	429 4.6%	734 65.7%	687 34.2%
	11957 100%	10312 100%	9253 100%	9253 100%	2704	2704
Lux	P= 6.83	DF 5	SIG .233			
student	246 5.0%	130 3.2%	85 2.4%	176 5.0%	161 65.4%	70 28.4%
working	2505 51.3%	2191 53.5%	1918 54.2%	1866 52.7%	587 23.4%	639 25.5%
unemploye d	79 1.6%	44 1.1%	37 1.0%	46 1.3%	42 53.1%	33 41.7%

housewife	1347 27.6%	890 21.7%	755 21.3%	991 28.0%	592 43.9%	356 26.4%
retired	700 14.3%	827 20.2%	726 20.5%	458 12.9%	+26 3.7%	242 34.5%
other	5 0.1%	10 .3%	17 0.5%	1 0.1%	+12	4 80.0%
	4882 100%	4092 100%	3538 100%	3538 100%	1344	1344
UK	P= 6.10	DF 5	SIG .296			
student	210 2.1%	183 2.1%	140 1.8%	163 2.1%	70 33.3%	47 22.3%
working	5647 56.8%	4990 57.5%	4578 57.9%	4675 59.1%	1069 18.9%	972 17.2%
unemployed	508 5.1%	447 5.2%	371 4.7%	369 4.7%	137 26.9%	139 27.3%
housewife	1131 11.4%	1068 12.3%	848 10.7%	891 11.3%	283 25.0%	240 21.2%
retired	1763 17.7%	1647 19.0%	1603 20.3%	1362 17.2%	160 9.0%	401 22.7%
other	332 3.3%	343 4.0%	360 4.6%	258 3.3%	+28 8.4%	74 22.8%
missing	343 3.5%		10 .1%	192 2.4%	333 97.0%	151 44.0%
	9934 100%	8678 100%	7910 100%	7910 100%	2024	2024

CHAPTER 4 CONCLUSION

4.1 Conclusion

This study compared, cross-nationally, some characteristics of respondents who leave longitudinal household panel studies during the second and third wave of interviewing. Many of the methodological problems that are encountered when carrying out such a study were overcome, because the panel studies that were used are similar in that they are surveying general representative samples and not specialised samples. The household panel surveys are also similar in design, questioning method and content, and field procedures, and have been harmonised and standardised into one database. Having overcome many of these methodological difficulties, we should expect to find similar patterns in terms of characteristics of respondents leaving the panels. This is to some extent what we did find. Using the "leavers with original status between Wave One and Wave Three" in seven cases out of the ten variables, we found all the countries or three of the four countries having the same category. These were: males, foreign nationals, tenants, the over 60s, first level of education, single persons, unemployed. These characteristics are largely echoed in the general literature on panel attrition; however our results are not statistically significant in all cases. When using "total leavers between Wave One and Wave Three" out of the ten variables, we find all countries except one or all of the countries have the same category which are: single, male, foreign national, 0 to .75 of mean income, tenant, 18 to 30 years olds, first level education, three generation

household, students. This that implies those respondents leaving the panel studies (when taking a change in status from their Wave 1 characteristics into consideration) are similar in all four surveys.

Having discovered some patterns in respondents who participate and do not participate in panel surveys, there is a need to know more about why such response patterns have been established. Taking this a step further, it will be necessary to develop efficient ways of adjusting for missingness. Patterns of non-response may well influence adjustment methods, with Rubin (1976) indicates three types of patterns for missing data: missing at random (MAR), observed at random (OAR), and missing completely at random (MCAR). When applying these patterns for the use of adjustment for non-respondents it is noticed MCAR will occur when the reason for non-response is completely independent of other variables. This will create a random subsample of non-respondents from the original sample. In this case the non-response will not necessarily lead to bias results and is to some extent ignorable (Allison, 1982). When respondents fail to participate because there is a probability of the respondents having certain characteristic (for example, low income and being elderly) then the resulting data is neither MAR or OAR, which is nonignorable and can lead to bias results. In this situation Rubin and Little (1987) have derived multiple imputation and error correction models for adjustments of the nonignorable missing data.

Another interesting approach to non-response adjustments has been carried out by Groves and Cooper (1995). They view the decision to participate or not to participate in a survey as a process that has random components, and therefore modelling can be used for adjustment. Their research was to develop a response propensity model which takes into consideration influences of Socio-demographics and social psychological concepts on response behaviour. Unlike most other modelling approaches to adjustment for non-response this would be applied postsurvey, in order to influence survey design on field approaches to contact and cooperation.

Future Research

The PACO database has proved to be a very good tool for examining attrition and future research could focus on adjustment procedures through modelling. This could be based upon an extension to Rubin and Little's (1987) work; to an extent, Goldstein has developed this through his work on multi-level modelling. This type of approach could use several known characteristics in combination, such as the extent to which low response in single person households is affected by the sub-groups making up single person households (for example, widowed elderly people and young socially active people).

Modelling estimations for missing data in longitudinal design has also been approached by Rovine and Delaney (1990). Their approach using likelihood function for estimating missing data with nested patterns (this occurs when subjects missing at one wave remain missing at all future waves) can be applied to our cross-national comparisons. The work of Brose and Klevmarken (1993) in modelling response behaviour and earnings also provides an interesting foundation to build upon using cross-national comparisons.

Other interesting areas to investigate would be how the change in status leading to change in demographic composition may affect attrition. This would generally be looking at issues discussed by Winkels and Davis (1992) on whether the individual becomes a non-respondent at random, or if there is a correlation between becoming a non-respondent and experiencing demographic change such as a household transition.

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