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Book section

Original citation:
Originally published in Jenkins, Stephen P. and Smeeding, Timothy M. (2018) *In praise of panel surveys, a Sonder-Panel, and a Sonder-Panel-Papa.* In: Erlinghagen, Marcel and Hank, Karsten and Kreyenfeld, Michaela, (eds.) Innovation und Wissenstransfer in der empirischen Sozial- und Verhaltensforschung. Campus Verlag, Frankfurt am Main, pp. 11-38. ISBN 9783593508672

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Innovation und Wissenstransfer in der empirischen Sozial- und Verhaltensforschung

Festschrift für Gert G. Wagner

Campus Verlag
Frankfurt/New York

Inhalt

In Praise of Panel Surveys, a Sonder-Panel, and a Sonder-Panel-Papa

Stephen P. Jenkins & Timothy M. Smeeding

Introduction

In this paper, we salute Gert Wagner and his work, focusing on his association with the Socio-Economic Panel (SOEP). To place Gert's contributions in context, we argue first that household panel surveys deserve to be praised for what they contribute to science and to public policy, forming a crucial component in a portfolio of different types of longitudinal data. Second, we show that the SOEP is a very successful example of a household panel survey, comparing its characteristics and innovations with those of its counterparts from other countries. Our case is that the SOEP is truly special (it is a Sonder-Panel) – and Gert Wagner has been responsible for much of this success. He is truly a Sonder-Panel-Papa.

Why Praise Household Panel Surveys?

Praise household surveys because they are a valuable source of longitudinal data, and longitudinal data are an important type of collection mechanism for addressing many social science issues relevant to policy. Longitudinal datasets are those in which the same set of individual units is tracked over time; we have movies on the same units rather than a series of snapshots on different samples of units as one does with repeated cross-section data. In principle, the movies may be created using surveys with retrospective recall questions, or using prospective data collection based on temporally-linked administrative registers, cohort studies, or – the focus of this paper – household panel surveys.

The Value of Longitudinal Data

Longitudinal data are valuable for three main reasons. They describe phenomena and relationships that are intrinsically longitudinal (and their correlates); they provide a better understanding of socioeconomic processes over the life course and behaviour and, thereby, they better inform policy.

First, considering better description, longitudinal data enable us to distinguish gross change from net change. We can relate a fall in the poverty rate to increases in flows out of poverty or reductions in flows into poverty (Bane/Ellwood 1986). In addition, some phenomena of scientific and policy interest are inherently longitudinal. Examples include how long people remain poor (poverty persistence) or sick, the extent to which exits from unemployment are sustained or represent a »low pay – no pay« cycle, the prevalence of residential mobility, and household formation and dissolution (marriage and divorce, births and deaths, and children leaving home or boomeranging back). We can look at not only events per se, but take spell-based perspectives, and assess how long spells last, how the chances of spell endings vary with elapsed duration, and with characteristics that change during the spell. Longitudinal data also provide information about the associations between current events and outcome experienced by individuals and their past history. We can study questions such as the relationships between current unemployment chances and past unemployment, children's development and life chances and their family background, income in old age and work-life history, current earnings and job tenure, labour market experience, and we can measure differences between current outcomes and past expectations (»surprises«).

Second, concerning greater understanding, longitudinal data, by contrast with cross-sectional snapshot data, allow us to better align our models with underlying constituent processes. Rather than modelling changes in the unemployment rate directly, we model the chances of leaving work among people who have a job, and the chances of finding work for the people who do not currently have a job. The drivers of each process (and the people at risk of the events) differ, and should not be thought of as the same. Going further, one can understand not only transitions per se but also – with a spell-based perspective – how the chances of getting a job vary with how long the spell of unemployment has been, and how the chances vary with circumstances that change during the spell (e.g. the amount of unemployment benefits the person is eligible for).

Empirical modelling and hence understanding is further enhanced by longitudinal data because they allow for the possibility of controlling for the effects on outcomes of not only observed characteristics such as age, sex, educational qualifications, but also the persistent characteristics of individuals that are unobserved (or intrinsically unobservable). Having repeated observations on individuals allows one to difference out time-constant factors of all kinds, observed and unobserved. Or one can exploit the fact that past histories of outcomes incorporate information about the realised effects of unobservables, and summarise their distribution.

More generally, we can make better causal inferences from our empirical models using longitudinal data because there is a temporal ordering in the data of outcomes (later) and hypothesized drivers (earlier). Indeed, longitudinal data are the essential ingredient of the social experiment revolution in evidence-based policy analysis and impact evaluations, using methods such as randomised control trials as well as several types of quasi-experimental designs (including differences-in-differences based on before-after comparisons for the same individuals).

Third, and a consequence of the two features just described, longitudinal data enable us to better inform policy. They enable better focus on the underlying processes, rather than on »problem groups« at a point in time (such as »the poor« or »single parent families«) that may be subject to a high degree of turnover in any case rather than being a fixed and unchanging population. The importance of this orientation is illustrated by David Ellwood, one-time advisor on welfare policy to President Clinton, who stated that:

»[D]ynamic analysis gets us closer to treating causes, where static analysis often leads us towards treating symptoms. … The obvious static solution to poverty is to give the poor more money. If instead, we ask what leads people into poverty, we are drawn to events and structures, and our focus shifts to looking for ways to ensure people escape poverty.« (Ellwood 1998: 49)

The same point was picked up on by the UK's reform-minded New Labour government:

»In the past, analysis … has focused on static, snapshot pictures of where people are at a particular point in time. Snapshot data can lead people to focus on the symptoms of the problem rather than addressing the underlying processes which lead people to have or be denied opportunities.« (HM Treasury 1999: 5)

Longitudinal data contribute to policy design because generally they provide policy-relevant contextual information about key risks and potential in-

tervention points relevant to policy focus and policy design and, specifically, they can be employed to evaluate the impacts of specific programmes. In short, they help us to understand not only the »Whats« of social indicators (such as poverty rates) but also the much more difficult causal »Whys« that help in successful policy design.

Household Panel Surveys: Key Features, and Examples from Around the World

The discussion above is about longitudinal data speaking generically, and there are multiple ways of collecting these. What are the particular features of household panel surveys such as the SOEP compared to other sources?

Household panel surveys are prospective longitudinal designs. Data collection is undertaken in an initial year (call it t) with repeated follow-up data collection points typically at (approximately) annual intervals thereafter (years t+1, t+2, …). The number of these has increased significantly over the last few decades. The pioneer and longest-running is the US Panel Study of Income Dynamics, which began in 1968 and celebrates its 50th anniversary in 2018. Major household panel surveys began in 1984 in Germany (Socio-Economic Panel; on-going), the Netherlands (Dutch Socio-Economic Panel, 1984–1997), and Sweden (Panel Study of Market and Nonmarket Activities, HUS, 1984–1998, and the Level of Living Surveys, from 1968 onwards). Over the following two decades, household panels began in Australia, Belgium, Canada, Korea, Luxembourg, the Lorraine region of France, Hungary, New Zealand, Switzerland, and Britain (the BHPS, 1991–2008). The BHPS has been superseded by Understanding Society – the UK Household Longitudinal Study, which not only incorporates the BHPS sample, but adds a new large sample of respondents (from 2009). There is the multi-country European Community Household Panel (ECHP) survey which used a cross-nationally harmonized instrument. In 1994, the first waves of surveys were fielded in twelfe member states, with some member states joining later. There were eight waves of fieldwork, with the final one in 2001. There are also a growing number of household panel surveys in other countries, including developing ones. Examples include the Korean Labour and Income Panel Survey (KLIPS), the KwaZulu-Natal Income Dynamics Study (KIDS), the Russia Longitudinal Monitoring Survey (RLMS), and the Indonesia Family Life Survey.

A distinction can also be made between perpetual (or indefinite) life panels such as the SOEP for which data collection is intended to carry on indefinitely, with no final collection date set at the outset, and rotating panel surveys for which the number of data collection points is fixed at the outset by design, and there are typically new panels starting each year (e.g. panel I starts in year *t*, panel II starts in year *t*+1, etc.), so that for any given calendar year, there are data from multiple panels. Leading examples of rotating panels are the panel surveys used to contribute longitudinal data for EU-SILC (there are four annual data collection points per panel), European labour force surveys (five quarterly data collection points per panel), and the US Surveys of Income and Program Participation (interviews every four months over periods of 2½ to four years depending on the panel).

Household Panel Surveys Compared to Retrospective Designs

Both types of prospective panel survey can be contrasted with retrospective designs in which there is a single data collection point, with the data for previous periods collected by retrospective recall of respondents about their circumstances and characteristics now and in the past. Because it is difficult to reliably collect information about income amounts and some other detailed aspects of people's lives, retrospective designs have focused on topics for which this is less of an issue, e.g. less detailed information about a respondent's parents such as job type or occupation at the time the respondent was a teenager (for studies of social class mobility), or fertility histories for mothers of young children (as in many Demographic and Health Surveys). Otherwise, the most common form of retrospective data collection is within household panel surveys, to collect information about the period between the annual data collection points, e.g. monthly job histories, with recall reliability issues mitigated by the shorter recall period.

Household Panel Surveys Compared to Cohort Surveys

Household panel surveys can also be contrasted with cohort surveys which are also perpetual panel surveys. The key distinctions relate to features such as the population of interest, frequency of data collection, and the nature of the data collected. Household panel surveys are surveys of the private

household population (individuals and their households), and are designed to maintain representativeness of the sampled population over an extended period. Representativeness is achieved by implementing particular »following« rules for data collections after the initial one. Original panel members are followed even if the household splits (e.g. a husband and wife divorce and move to form two separate households) or is geographically mobile. Children who are members of respondent households become respondents in their own right when they reach a particular age (in the SOEP it is the year the child turns 17). The survey design mimics the way in which the population reproduces itself over time.

By contrast, cohort surveys are more narrowly focused on individuals with a particular set of defining characteristics, and hence are designed to maintain representativeness of the sampled cohort (they are individual- rather than household-focused). The leading examples are birth cohort surveys, in which there is sampling of many (or all) individuals born round a particular date. For example, the UK has had birth cohort studies following individuals born in 1946, 1958, 1970, 1980, and 2000/1.

In a cohort survey, each cohort member is followed over time and, although there may be some data collection about co-resident individuals on each occasion, the co-residents are not always followed. Interviews are typically less regular than for household panel surveys (often several years apart but not always thus) and cover much longer periods of individuals' lives. (The UK's 1958 birth cohort study recently interviewed individuals aged 55.) Other types of cohort surveys cover transitions from school to work and thereafter (e.g. the National Longitudinal Studies of Youth in the USA), or from work to retirement (such as the US Health and Retirement Study, and the English Longitudinal Study of Ageing, each focusing on individuals aged 50+).

Data collection in cohort studies is relatively frequent initially when development is relatively rapid (early childhood in birth cohort surveys) and less frequent thereafter through the life course. (The UK's Millennium Cohort Survey which started in 2000/1 has collected data so far at ages nine months, three, five, seven, eleven, and 14.) The long-running nature of birth cohort surveys means that they focus on developmental and life course and intergenerational issues, and the topic focus varies between sweeps. By contrast, household panels with their annual data collection focus on topics for which short-term changes are more relevant, notably subjects such as labour market activity, incomes and other factors related to living standards, hous-

ing conditions, demographic change, and so on. High priority is given to repeated measurement of the same phenomena: the same topics are covered at each wave rather than changing from wave to wave as with cohort surveys. In addition, data collection refers to all individuals within the household by design (all of whom are followed over time), rather than one particular person and a varying degree of information about their household context.

Household Panel Surveys Compared to Linked Administrative Data

All the discussion so far has tacitly assumed that data collection is undertaken using a survey of the targeted respondents, whether the survey is done face to face or by other modes, such as telephone or web. Longitudinal datasets can also be compiled by temporal linkage of administrative register data.

Administrative data have distinct advantages. They are typically based on very much larger samples and more comprehensive coverage than possible in surveys, participation is not a choice of the targeted individuals (reducing problems of unit non-response and loss to follow-up), and data are often viewed as being more accurate than respondent recall (e.g. income data included in the registers may come directly from employer payroll records, and penalties against tax avoidance may reduce incentives to under-report income). Also, the data are cheap to collect by comparison with surveys – they already exist as a by-product of the administrative process.

However, the by-product nature of the data collection process also signals the main disadvantages of administrative register data. The scope of data collection is limited to the sponsoring agency's purposes, not the goals of researchers. The outcome variables in the longitudinal data may be rather limited in number and definition, and there may be few of the additional covariates that are routinely wanted for empirical modelling, e.g. income tax return data do not include information about a tax-payer's educational status because this is not relevant to assessing tax due. Similarly, no information about household composition may be collected. Precise details about pay may not exist for individuals earning below the social insurance liability threshold or above the maximum amount (as in the Integrated Employment Biographies from the German Institute for Employment Research (IAB)). Furthermore, payroll tax records do not capture non-covered earnings, which are reported on surveys, thus underestimating the variable of interest (Hoyakem et al. 2016). Major changes in a tax system may introduce

non-comparabilities over time in coverage or variables collected. In countries with individual-based tax systems, it is usually impossible to link individuals with other household members. For this reason, longitudinal administrative data are most useful for individual-focused analyses and less useful for studies in which household context is important (which is of course the forte of household panel surveys). Finally, because of the very nature of much administrative data, there are concerns about privacy and confidentiality, so that researchers' access may be only under restrictive (or inconvenient) conditions, or the variables made available in the public use data may be censored or in banded form to reduce disclosure risks.

This is not to say that administrative data are not valuable to panel surveys. Indeed the ability to link records for panel survey respondents to administrative data can help us understand the topic of panel attrition and its possible biases in much greater detail than by any other method (US National Academy of Sciences 2016).

Household Panel Surveys: Conclusions

On balance, it is impossible to say generally whether household survey data or linked administrative register data are best: it depends a lot on the national context and also the research question. At one extreme lie the Nordic countries with widespread use of administrative register data, characterized also by extensively linking across different types of registers. This means that it is possible to look at household context as well as individual circumstances per se, and a wide range of both outcomes and covariates. Also facilitating use are national cultures in which using a national identity (or social security) number for many purposes is widely accepted, and there are fewer concerns with personal privacy issues related to income and taxation than in most other countries. In other countries, the use of longitudinal administrative data is growing but not as developed. A notable example is the work of Chetty and colleagues linking US Internal Revenue Service records to derive income histories and to link individuals and their parents, and also exploiting detailed information about geographical location and correlates of intra-area mobility (see e.g. Chetty et al. 2014; 2016).

The upshot is that there remains a substantial role for household panel surveys as a source of longitudinal data, particularly for research questions that require information about household context – including interactions

among household members, whether concerning their living standards or demographic behaviour – and across multiple life domains (e.g. work, family, attitudes and beliefs, etc.). In addition, most countries use measures of household- or family-level income and resources when monitoring levels and trends in individual economic well-being and for assessing eligibility for social assistance and other income support programmes. Even where longitudinal administrative data are not available, administrative data may be used to supplement and enhance survey data collection. In some cases, one may be able to link administrative register data with survey respondents. (An example is the linking of test scores and other information in the English National Pupil Database with members of the UK birth cohort surveys.) This raises issues of informed consent to data linkage, and other linkage biases arising when statistical matching across registers is required. Another form of panel survey data supplementation is the matching of geocoded data about the areas in which respondents live rather than linking at the individual-level data. We return to this below with reference to the SOEP.

A further important characteristic of household panel survey designs is that they have been implemented in very similar ways in a number of countries, and there is a core set of variables that is common to each of the surveys. Both features mean that production of cross-national harmonized data is relatively straightforward, at least in principle, though also dependent on securing the resources to make it happen. The notable success in this area is the Cross-National Equivalent File (CNEF), to which almost all national household panel surveys contribute data. Comparable cross-national panel data are available in the CNEF from eight countries, the contributing surveys being the PSID, SOEP, SLID, BHPS, HILDA, Swiss HPS, and KLIPS. See Frick et al. (2007) for a description of the CNEF.

This picture of richness of cross-nationally comparative data is a marked contrast with that for longitudinal administrative register data, because countries differ so much in their social policy institutions and the systems used to administer them. Cross-nationally comparable data are also rare for birth cohorts because designs have differed, but exist for cohort surveys of elder people – precisely because comparability and harmonization were built in at the start. We are referring to the Survey of Health, Ageing, and Retirement in Europe (SHARE), modelled on the US Health and Retirement Study, which began with twelve participant countries and since expanded to include many more.

We summarize the principal features of household panel survey designs for the collection of longitudinal data in Table 1, comparing their advantages and disadvantages relative to other data collection designs. The main advantages of household panels lie in their focus on individuals within their household context, the coverage of multiple life domains, and the relatively high frequency of data collection, enabling coverage of relatively frequent life events and exploitation of repeated measures modelling techniques.

In the next section, we continue the story, but elaborating some details not covered so far. Focusing on the case of the SOEP, we demonstrate how it stands out as an exemplar of a good household panel survey.

Table 1: Household panel surveys: design features, and their advantages and disadvantages

Design feature	**Advantage or disadvantage relative to other longitudinal designs**
Sample size	Small relative to longitudinally-linked registers and rotating panels
Panel length	For perpetual life panels, depends on maturity (but longer than rotating panels)
Data collection frequency	Annual (mostly by personal interview); more frequent than most cohort surveys
Coverage and representativeness	Focus on national populations of individuals living in private households (cf. individual focus in cohort surveys and most linked registers)
Topics covered	Intentionally broad, covering all life domains (broader than cohort or linked registers), typically with topic-specific modules on a multi-year rotating cycle
Attrition	Potentially a greater problem than for linked registers or rotating panels
Measurement error	Greater than for longitudinally-linked registers
Availability and access	Much greater than for longitudinally-linked registers
Cross-national comparable data	Good by comparison with longitudinally-linked registers and most cohort surveys

Note: Adapted from Jenkins (2011: Table 3.1).

Why is the SOEP Special?

The SOEP is an example of a household panel survey, as we described in the previous section. But what makes it such a good example? In this section, we provide answers to this question. We write as researchers based outside Germany, and emphasize a number of features that strike us personally; we are not aiming to be comprehensive (for the SOEP team's own view of the situation a decade ago, see Wagner et al. 2007.) The gist of our story is that, as the SOEP has evolved, it has incorporated changes and innovations that address a number of the disadvantages or vulnerabilities that are often associated with household panel surveys. We focus on developments in sample design, content, user support and access, and resources.

The SOEP is now the longest-running household panel that has not experienced major changes in design and content, 1984 to present day (33 years). To be sure, the PSID started in 1968 and is still going, but it has had a major design change (the switch to data collection every second year in 1999, the change from face-to-face to computer-assisted telephone interviewing in 1993), and the PSID's content coverage of life domains is not as comprehensive as the SOEP's. The long-running nature of the SOEP means that one can look at not only short-run change (as with all household panels), but also increasingly able to address intergenerational issues by having data collected for parents and their offspring, and there is greater potential for following individuals over their course from cradle to grave and across multiple generations – increasingly the PSID's focus and comparative advantage.

Sample Design

Among the major household panel surveys, the SOEP was the first to move away from the PSID model of using a single respondent to provide information about all household members and the household itself. Instead, all adult members of SOEP households receive an individual questionnaire (and there is also a household questionnaire completed by one person). Clearly, collecting data in this way is more expensive, but has great advantages in terms of reliability (adults report about their own circumstances rather than relying on the reports of a proxy), and also makes it possible to address new research questions relating to within-household bargaining and other matters.

Representativeness and sample composition are important issues for all household panels as they mature. Respondent drop-out (attrition) is the problem most commonly flagged in this respect, but there are also more fundamental questions concerning the on-going representativeness of the target population (individuals in the private household population).

One consequence of attrition is a fall in sample size over time, leading to less precise estimates. This is a particular problem when looking at small-sized population subgroups (e.g. lone parents; some minority groups). More than any other household panel survey, the SOEP has systematically and repeatedly introduced new »refreshment« samples of the German population purely for this reason: sample E in 1998, sample F in 2000, sample H in 2006, sample J in 2011, and sample K in 2012. In each case, more than 1,000 households were added and often more (3,136 in sample J).

By construction, the first wave of a household panel survey aims to be representative of the private household population in that initial year, and representativeness of contemporary society in subsequent years is maintained by the survey's following rules – as long as the society does not change its fundamental character (or there is differential attrition – see below). But, as is well known, what constitutes »Germany« has changed in very fundamental ways, because of reunification and immigration, and the SOEP has responded to this challenge.

Perhaps the most far-sighted innovation of the SOEP was to introduce a new sample of more than 2,000 households in Eastern Germany in 1990, just months after the fall of the Wall and around the time of formal reunification. Thus, the reconstitution of German society has been tracked from the very start by the SOEP, and it has provided invaluable information about how differences between East and West have dissolved or persisted. Interestingly, a recent SOEP-based commentary, two decades on, states that »differences between East and West still exist in many areas. But they depend much more on the concrete living conditions in a specific place than on whether people or their parents lived on one or the other side of the inner-German border« (Krause, cited in DIW Berlin 2013). This is an incredible achievement in such a relatively short period of time, and a tribute to the underlying strength of the German economy and related social and political institutions.

Immigration has long been a major feature of German post-WWII society, including the arrival of »guest-workers« decades ago, the migration of ethnic Germans after German reunification, including the arrival of refugees more recently. German society today is much more diverse than German so-

ciety in 1984. If the SOEP had continued to be based on the original 1984 sample, its contemporary samples would provide a biased picture of society today. But this has not been the case.

The SOEP has accounted for immigration all along. In order to be representative of Germany in 1990, the SOEP already included a special sample of households headed by someone from Turkey, Italy, Spain, Greece, and the former Yugoslavia. In 1995, a sample of around 500 households of immigrants who had moved to Germany after 1984 was added. And a substantially larger sample, of around 2,700 migrant households, was added in 2013 using register data held by the Federal Employment Agency (IAB) to develop the sampling frame. In 2016 the SOEP added a special random sub-sample of refugees coming to Germany between 2013 to 2015 (Brücker et al. 2016). Societal change is also reflected in the way these samples and their target populations are referred to by the SOEP. At the outset, there were many references to »guest-workers« or »foreigners« rather than the more generic »immigrants« used now. Other high immigration countries such as the USA and the UK have introduced special samples of immigrants and ethnic minority groups (mostly immigrants) in their household panel surveys, but in neither case has it been as thorough or as successful as in the SOEP.

Immigrants are an example of a group of particular interest. Another such group is »the rich«. The interest stems from both substantive reasons – growing concerns about inequality and gaps between the rich and the poor – but also methodological reasons. Household surveys of all kinds (not only panel surveys) are often cited as under-representing the richest households in a society by comparison with benchmarks derived from personal income tax register data. The SOEP has been a pioneer among household panel surveys in its introduction of a »high income« sample, starting to track around 1,200 households from 2002 onwards. Interestingly, around 100,000 households had to be screened in order to generate this number of respondents (Wagner et al. 2007: 13) – establishing contact and securing a successful interview is difficult – and yet, once interviewed, retention rates are as high as for other types of respondents (Kroh et al. 2015, Table 3.1).

As a result of its specially targeted and refreshment samples, there are now twelve SOEP samples. This is another distinctive feature of the SOEP – no other household panel has so many – and it gives rise to complexities for the data producers and users that are perhaps under-appreciated. The issues stem from the fact that the respondents to each of the different samples had a different probability of selection into the survey, and this has to be taken

account of in any analysis. In principle, doing so is straightforward: to derive population estimates, data should be weighted by the »design weight« appropriate to each sample (the inverse of the probability of selection), and these are known. In practice, things are rather messier, because weights also need to take account of cross-sectional non-response (as all samples do) and non-response over time (attrition) in order to enable derivation of population-representative estimates – non-respondents may differ in significant ways from respondents, as hinted above. In addition, weights may be further adjusted so that sample estimates correspond to population totals (grossing-up or post-stratification).

Practical complications increase the larger number of survey waves there are and, related, because there are a very large number of potential samples that analysts might use in longitudinal analyses – ranging from the pooling of year-on-year transitions over a number of years to spell-based analysis based on samples defined by response over a large number of waves, and users may wish to base analysis on some of the various SOEP samples but not others. This is an example of the more general issue that the weights supplied by survey data producers are often general-purpose weights, not tailored to a particular analysis or »population«.

There is no easy remedy for addressing the complexities associated with weights (especially since many of them are conceptual). However, the SOEP has been exemplary in its development of different types of weights (cross-sectional and longitudinal) for users and been responsive to their needs. From early on, the SOEP has provided information about survey design (clustering and stratification) and separate design weights as well as weights accounting for non-response, attrition, and grossing-up. Compare this with the PSID (which supplies only one type of weight) and the BHPS (which supplies only one type of longitudinal weight, relevant to individuals with continuous panel participation from the start of the survey), whereas the SOEP has separate longitudinal weights referring to wave-on-wave non-response for each wave. This richness of detail has come at the price of complexity: the SOEP staff member responsible for weighting has remarked that »our impression from users« feedback was that after 25 waves, the growing number of weighting variables for each wave but also for different combinations of sub-samples … made the SOEP less accessible to new users. One aim of the revision was thus to concentrate on the »standard« variables in the data distribution. (Kroh 2009: 1–2) At the same time, there is detailed docu-

mentation and training in the meaning and use of the different sets of SOEP weights available: see e.g. Kroh (2010).

We cannot leave discussion of SOEP samples without also mentioning the Innovation Sample (SOEP-IS), introduced in 2012 as an enhanced replacement of the existing pre-test sample, combining a new subsample with subsamples of respondents from existing samples E and I. (SOEP-IS also replaces the previous SOEP pre-test sample.) The primary goal is »to test innovative survey methodologies and apply them to a representative longitudinal sample of the German population. A further objective is to test innovative procedures that go beyond the classic survey components (after pretesting if required) with an adequate sample size for high-quality data analysis« (Richter/Schupp 2012: 4). This is a major methodological enhancement. SOEP-IS has many features in common with the Innovation Panel component of the UK Understanding Society household panel survey (introduced in 2008), for example in its aims and the use of annual competitions among users for questionnaire space, but is distinctive nonetheless. There is the combination of old and new samples, and the sample size in total is more than twice as large, which substantially expands the scope for methodological experimentation.

Survey Content

Innovations in survey content are the second main area in which SOEP is special. By content, we mean the areas of people's lives about which data are collected – the questions that are asked of respondents and the range of variables available to users. Compared to other household panel surveys, the SOEP has been notable for its emphasis on psychological and attitudinal measures. From the very outset, the SOEP was innovative in collecting data about self-reported life satisfaction (on an eleven-point Likert scale) as part of a more general goal to assess social progress using a battery of social indicators in addition to income alone. (For a detailed discussion of the genesis of this dimension of the SOEP, see Schupp 2015.) As a result, the SOEP has become an essential core component of survey-based studies of life satisfaction. The most widely cited research paper in the history of the SOEP, according to the SOEP's online Newsletter (February 2017) is Winkelmann and Winkelmann's (1998) study showing that job loss makes people unhap-

py and this unhappiness arises from more than simply the loss of earned income.

Even if one restricts oneself to more traditional money-based measures of well-being, the SOEP has been innovative. From early on, the SOEP has routinely provided, as part of the user database, a measure of household disposable income that is consistent with international standards such as set down by the Canberra Group, and constructed from respondents' reports about the income received from each element of an extensive menu of potential sources over the previous calendar year. The PSID produced these household disposable income measures only in its early years, and the BHPS never did it. In both cases, however, these household disposable income variables have been produced separately from the main survey releases and without the same level of institutional investment, quality control and timeliness of data release. In addition to the »Canberra« household disposable income variable referring to the previous year's income, the SOEP also has data about the current household net income derived from household heads' responses to a single question.

To return to the psychological aspects of people's lives, the SOEP has been a pioneer among household panel surveys in its use of occasional supplementary modules to collect data about personal psychological traits. By these, we refer in particular to the »Big Five« personality traits (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism), as well as measures of risk aversion, trust, fairness, and reciprocity. Data collection on two measures of cognitive ability, based on simple tests, has also been introduced. Hence both cognitive and socio-behavioural traits can be tracked over time for the same individuals and related to current and past events, including educational experiences, as they move through the life course.

Although the SOEP was conceived as a »socioeconomic« panel, it has been an earlier responder to scientific interest in the overlaps between socioeconomic and health domains of people's lives, for example, considering issues such as the relationship between obesity and income or education. The SOEP has long collected self-reported measures of height and weight, but it was also the first household panel to collect physical health measures (after specialist panels focusing on older people), notably a measure of grip strength from 2006 onwards.

As the SOEP has matured, its potential for looking at the whole life course has been matched by a greater focus on specific population groups

and life events using specially-tailored survey instruments. The principal examples of this are the Mother and Child questionnaire modules. Since 2003, data have been collected about new-born children; from 2005, data on infants; from 2008, data on children entering primary school; and from 2013, children entering secondary school. Since 2001, adolescence-specific data have also been collected from first-time respondents (aged 16 or 17). Event-triggered instruments are being planned around partnership dissolution, and transitions from work to retirement. The extra information about early childhood is reminiscent of the PSID's innovative Child Development Supplement – in 1997, additional data were collected about children aged 0 to twelfe and their parents, with follow-ups of these families in 2002/3 and 2007/8. A new cohort began in 2014. The BHPS has a self-completion Youth Questionnaire directed at children aged eleven to 15 (i. e. not yet full non-respondents) that started in 1994. The SOEP's Mother and Child modules borrow the same basic ideas from these predecessors, but have been more systematic in their coverage of different childhood stages.

A further major development over the last decade of the SOEP is its improved capacity for spatial analysis. Given the sample sizes of household panels (and their clustered design), estimates for country regions below the national level are rarely possible, the major exception being the UK's Understanding Society panel survey with its very large sample size (around 40,000 households). Sub-national estimates for the SOEP are only representative of the very largest federal states in Germany.

The enhanced capacities that we are referring to is the potential for linking geocoded data to respondents using multiple levels and definitions of geographical areas. Facilitating these improvements have been changes in perceptions about the potential net benefits of having such data combined with the design of appropriately tailored user contracts to ensure that respondent confidentiality and privacy are protected, plus technological advances that make it possible to use sensitive data securely. One can now link in geocoded information at the county level and do so remotely using SOEP-Remote (a remote access platform based on the successful LISSY platform developed by the LIS Datacenter) and having signed a special user contract. Data can now even be linked at the postcode level for users making special arrangements with DIW Berlin and using the in-house secure research data centre. From being perhaps a laggard among panel surveys in facilitating geocoded data analysis, the SOEP is now among the leaders, with innovative data access solutions.

Documentation and Data Access

Among household panel surveys, the SOEP has always stood out for its extensive documentation, and for documentation in an easily digestible form to help new users (see SOEP Group 2017). The SOEP team has developed these in English as well as German – a smart move that has ensured that the SOEP's use among non-German users has always been remarkable. Similarly inspired was the »95 percent scientific use version« directed at international users from very early on, enabling them to use the data in a manner that would not broach Germany's data protection laws.

The DeskTop Companion has long been the essential starting place for new users and a useful reference for experienced ones. There is a bespoke data extraction tool, John Haisken-deNew's PanelWhiz that makes it much easier to extract complex longitudinal data from the multiple data files of different type and year. With the same goal, the SOEP has recently introduced a new data release format, SOEP-Long, in which data are ready-supplied in long (panel) form and so do not have to be combined and reformatted from wave-specific files. We already mentioned SOEP-Remote above. The SOEP team has also developed a user-friendly metadata system that is also used by other longitudinal studies (http://paneldata.org).

Resources and Infrastructure

It should be clear from our discussion so far that the SOEP is definitely special – it is a Sonder-Panel. Other household panel surveys have some of the features we have highlighted; it is the one that has them all. The explanation for this, and an additional distinctive feature in itself, is the SOEP's resources and infrastructure. (The team and its leader are also important, a point we return to in the next section.)

Our perception is that the SOEP has received greater core funding support than other household panel surveys, if not in terms of resource levels per se, then in longer-term stability of support. The SOEP began life in 1983 as a special research area (Sonderforschungsbereich, Sfb) in the »Microanalytical basis of social politics« based at the Universities of Frankfurt am Main and Mannheim. (Sfbs are collaborative research centres with long-term funding from the German Science Foundation, and multidisciplinary research programmes.) Sfb funding lasted until 1989 and then between 1990

and 2002 the SOEP was funded directly by the DFG, with additional support from the Federal Ministry of Education and Research. Nowadays, the SOEP receives its funding through the Joint Science Conference (Gemeinsame Wissenschaftskonferenz, GMK, an organisation with oversight over research funding, science and research policy issues jointly affecting the federal and state governments), by the Federal Ministry of Education and Research (BMBF), and the State of Berlin and other federal states. In short, the SOEP has moved from project-based science foundation funding to being incorporated into the national institutional infrastructures supporting science and research. And yet, at the same time, the SOEP retains greater discretion over the scientific direction.

This contrasts with the experience of household panels in the USA and UK. The PSID was initially funded by a government agency (Office of Economic Opportunity), but for a long time has been supported by a portfolio of national science foundations (including the National Science Foundation, which is currently the largest single funder, and the National Institute on Aging) and other co-funder organisations which include government departments. Refunding rounds occur every three to five years, and have involved a tough battle on each occasion, with pressures to include special modules at the expense of core longitudinal content, and there have been some cuts to sample size. Similarly, the funding for the BHPS and for its successor, Understanding Society, come from the Economic and Social Research Council (the main national social science research funder) together with a number of co-funders, mainly government departments, and also for time-limited periods (around five years). Refunding rounds have been and remain a fraught process involving submissions in a competition with other major science funding bids every five years. Australia's HILDA funding model is closer to the SOEP's; it is supported by the Department for Social Services, a federal government department, and has funding guaranteed for 18 waves. The use in the UK of competitive tendering processes led to a different fieldwork agency being used for Understanding Society data collection from the one used for 18 waves of BHPS data collection. The fact that the SOEP has been able to use the same agency (TNS Infratest Sozialforschung, known as Kantar public since 2016) for decades and develop a very close relationship with it, is another source of stability that other studies surely envy.

Along with greater and more stable funding support, our impression is that the SOEP team has been able to retain greater discretion over scientific direction than other study teams. In the USA, UK, and Australia, the

competitive funding environment places greater control in the hands of the funders and the other constituencies represented among referees for funding bids and boards of governance (and their membership changes over time). One of us, a two-term member of the PSID Board of Overseers, experienced this turbulence first hand. The other of us, part of the BHPS team, was a member of the SOEP Scientific Committee around a decade ago and observed first-hand how the SOEP governance structure allowed the team to make strategic choices relatively independently and quickly. This was the era in which the strategic choice was made to incorporate collection of cognitive measures and behavioural experiments and quickly actioned in a way that could never have happened with the BHPS.

There is another feature of national context that has worked in the SOEP's favour and which contrasts with the US and UK environments. Our understanding is that when the SOEP began in 1984, it was one of the only socioeconomic data sources for Germany to which researchers had access to unit record data – for repeated cross-section data let alone longitudinal data – and thereby could better address a wide range of scientific research questions. Thus the SOEP was able to embed itself in German social science early on, and this influence has persisted. The SOEP's reputation for high quality data has reinforced this position, and it is not only for its longitudinal data – the cross-sectional data are also highly valued.

Our arguments are illustrated by the debates about the quality of the income data in the Survey of Income and Expenditure (EVS) and the data for Germany (that initially) contributed to EU-SILC. The SOEP was widely accepted as providing a benchmark to assess the relatively poor quality of these two sources from both cross-sectional and longitudinal perspectives: see e.g. Becker et al. (2003), Hauser (2008), and Frick/Krell (2010). The preeminence of the SOEP is further illustrated by the fact that it is used as the data source in chapters about income and wealth in the annual national report on social conditions and trends and, for this purpose, the SOEP's cross-sectional data are used more than the longitudinal data (Goebel/Krause 2016, Grabka/Westermeier 2016). The repeated cross-section data for Germany available from the LIS Cross-National Data Center have continued to be sourced from the SOEP for many years, and not from the other German sources now available.

The multiple roles that the SOEP has come to play in the data portfolio for Germany have no parallels in other countries. For example, in the USA, the Current Population Survey has (since the start of the 1960s) always been

used as the principal source of cross-sectional data about the income distribution, and the PSID has never threatened this role. Similarly, in the UK, the Family Expenditure Survey and, since the mid-1990s, the Family Resources Survey, have always been the preeminent cross-sectional data sources, never the BHPS. Moreover, US and UK researchers have long had access to unit record data from the surveys mentioned. The situation is quite different from Germany.

A final example of the national embeddedness of the SOEP are the recent initiatives under the heading of SOEP-Related Studies (SOEP-RS). These refer to surveys separate from the SOEP, and with a rather different scientific focus, but incorporating major components of the core SOEP questionnaire. There are six studies existing or planned, of which a leading example is the Berlin Aging Study II (BASE-II), with more than 2,200 participants. The SOEP-RS webpages (DIW Berlin 2017) state the idea that these studies are »able to validate their results on a representative sample of the German population«, i. e. the SOEP. This is very different from the UK situation, for instance. The BHPS questionnaire was designed in large part using questions from existing national surveys in order to enhance comparability with them – the validation benchmarks are the other national surveys, not the household panel survey.

Conclusions: Gert Wagner is a Sonder-Panel-Papa

We have sung the praises of the SOEP. In this section, we argue that Gert Wagner has played a key role in this success, aware that attribution of responsibility is a tricky business, especially when teams are involved. Hans-Jürgen Krupp, the SOEP's founder and first SOEP director, stated at its 25th anniversary celebration that

»the SOEP project's success cannot be attributed solely to the efforts of individuals. SOEP is a compelling example of the vast potential for teamwork in scientific social and economic research. For this reason, SOEP's development was not disrupted by the changes in leadership when I moved to Hamburg to take office as Senator for Financial Affairs and Sociologist Wolfgang Zapf took over for about one year in 1988/89, or when Gert G. Wagner finally took over from him. Rather, quite the opposite was the case: Gert Wagner brought the SOEP project important new innovations and increased momentum« (Krupp 2009).

So, despite our caveats, please note the final sentence of the quotation.

Gert took over as SOEP director in 1989, remaining in charge until 2011. He was closely involved in the highly innovative initiative to launch a new sample in Eastern Germany in 1990. As he has said: »[t]he end of the GDR took us by surprise, but we reacted quickly« (quoted in DIW Berlin 2013).

Gert is a multi-disciplinary social scientist par excellence, who recognised the potential of extending the »socioeconomic« in SOEP to include other spheres, in particular psychology (the large portfolio of psychological measures), child development (the Mother and Child Questionnaires), and biosocial science and health (physical measures). Gert may not always be the inventor of the new ideas, but he has been the all-important person ensuring that innovations are implemented. Other panel studies had wealth modules (PSID) or an innovation survey (Understanding Society), but Gert and his team recognised their value, learnt from their experience, and then implemented remarkably successful adaptions of these instruments in the SOEP context.

We would emphasise »Gert and his team«. Gert was a leader and he led from the front, with an enviable talent to delegate and trust. Gert recognised and brought on the talents of senior staff such as Jürgen Schupp (today's SOEP director) and the late Joachim Frick (former deputy director, with Jürgen Schupp). Building a team and being able to successfully pass on the baton is a real tribute to Gert's talents.

Gert is also a whole-hearted internationalist, and has played a significant role in embedding the SOEP into the international world of science, conscious not only of the SOEP's national role, but aware of the potential benefits of cross-national comparative research, and of getting social scientists from outside Germany to contribute their expertise and knowledge and also to use the data.

Gert was instrumental in the beginnings of the CNEF. He worked with Richard Burkhauser and one of us in the early 1990s under the auspices of an NIA program project grant to harmonize the PSID and SOEP, with the BHPS joining the CNEF relatively soon afterwards. Hauser et al. (2016: 3) refer to how »over the next decade, with the full co-operation of Greg Duncan (who directed the PSID) and Gert Wagner (who directed the SOEP), this grant funded the creation and expansion of the Cross-National Equivalence File (CNEF)«. Richard Burkhauser has also told us that, from the beginning, Gert tried to make the SOEP data set a »data treasure« to be shared with the worldwide research community and, for years, he provided fund-

ing to the CNEF to facilitate the integration of the SOEP and for new-user presentations in the USA tailored for American faculty members and their graduate students. For almost a decade, Gert raised »Transcoop« funds to bring SOEP scholars to Syracuse University (where the CNEF was based), including Markus Grabka, Karsten Hank, Michaela Kreyenfeld, Johannes Schwarze, and Katharina Spieß.

If researchers outside Europe were asked to think of German social science research over the last few decades, we think many would start by mentioning SOEP-based work and much of it would be by the SOEP team itself. Gert's enthusiastic support for the SOEP's participation in cross-national data harmonisation has played an important part in this, including projects such as CHER and PACO, the ECHP, LIS, and of course the CNEF. The SOEP 95 percent Scientific Version that we cited earlier is a further example of the internationalisation.

Convinced that immigration was amongst the most important forces taking over Europe as well as the rest of the world, Gert brought the German minister responsible for immigration twice to Luxembourg to participate in two conferences on Immigration and the Future of Europe, co-funding the event and contributing to the conference volume (Brücker et al. 2006, Parsons/Smeeding 2006) as well as making earlier contributions (Frick et al. 1999).

Gert was also instrumental in contributing to building of the eastern European coverage of the LIS in his work on comparative pension reforms (Schrooten et al. 1999). And with Joachim Frick he was instrumental in helping fund and build the cross-national Luxembourg Wealth Study, with the SOEP wealth supplements being amongst the first to be added to this dataset.

We would also salute Gert's contributions to research infrastructure and science policy internationally. He has long been an active participant in European-wide discussions about social science data infrastructure and policy. He has argued persuasively for differentiating between the funding and the generation of data, making the case for government involvement in the former but not the latter. An early statement of this appears in Wagner (1999). Gert's case has been borne out: the most successful national household panel studies to date have received public funding, but been administered by scientists and research centres, not by national or international statistical agencies (cf. the SOEP with, say, the European Community Household Panel or New Zealand's SoFIE).

At the same time, Gert has played a crucial role in the incorporation of the SOEP into institutional and funding infrastructures. To be sure, the SOEP first came to DIW Berlin because Hans-Jürgen Krupp was DIW President at the time. But it is under Gert's leadership that the SOEP was recognised as an independent department of the DIW (2003), and it has evolved into and been funded as a research-based infrastructure, and part of the Leibniz Association. It is unsurprising that Gert's substantial experience and wisdom has led to significant advisory roles such as chairing the Social Advisory Council (Sozialbeirat) and service on the German Advisory Council for Consumer Affairs, the German Council for Social and Economic Data, the Advisory Board to Statistics Germany, and the German Science Council (Wissenschaftsrat).

Over the two decades he was in charge, Gert was closely associated with taking the SOEP from its precocious childhood to mature adulthood. Although he has now moved »upstairs«, he retains a key advisory role: having joined the executive board of DIW Berlin, he represents the SOEP there. To us, there is no question that Gert should be honoured with the title of Sonder-Panel-Papa.

Acknowledgements

Jenkins's research is partially supported by an Australian Research Council Discovery Grant (award DP150102409) and core funding of the Research Centre on Micro-Social Change at the Institute for Social and Economic Research by the University of Essex and the UK Economic and Social Research Council (award ES/L009153/1). Parts of the paper draw on material from Jenkins (2011, chapter 4) which also contains references to further relevant literature. We also make use of the SOEP's excellent webpages. We pay tribute to all those who have made the SOEP such a success, not least Gert Wagner, but also the late Joachim Frick whom we remember fondly. We thank Rich Burkhauser and Jürgen Schupp for helpful comments on a first draft of the paper.

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