SciencesPo

SÉMINAIRE

Centre de recherches Internationales

Centre d'études européennes et de politique comparée

Les sciences sociales en question :
grandes controverses épistémologiques et méthodologiques

Compte-rendu de la 63e séance

Advantages and limitations of panel surveys

13 janvier 2023

Nonna Mayer starts by announcing the good news. Her friend and colleague Fariba Adelkhah, who has been in prison for more than three and a half years, has just been released. The bad news is that Paul Marx, who planned to attend in person was unable to make it, so the session will be held on Zoom.

The day's session is devoted to panel surveys, their advantages and limitations[1]. Panels have been used in the social sciences since the 1930s, thanks to the pioneering work of Paul Lazarsfeld and the Columbia school. Today, there are many large-scale national and comparative panels (SHARE, SILC, Household panel surveys, for example), but they do not often include political questions. France was rather late to this field, with the exception of the early electoral panels of 1958 and 1965-1967, as well as the pioneering youth panel of Anne Muxel in 1986. Although the CEVIPOF (Centre de recherches politiques de Sciences Po) does have a long tradition of

[1] This summary was written by Justine Brisson and checked by the two speakers. Warm thanks to Caitlin Gordon-Walker who did the English editing.

electoral panels (2007, 2002, ENEF 2017 and 2022), it has mostly focused on short periods of time and data are often not available. One recent major achievement in the field is the ELIPSS (Études longitudinales par Internet pour les sciences sociales) project. But these panels also have their limitations.

Drawing from his work on political involvement based on large-scale panels, Paul Marx[2] (University of Duisburg-Essen, Visiting Professor at CEE) talks about his longitudinal approach, based on comparative panel surveys, and shows how it captures better than cross-sectional data the political impact of income change or unemployment. Nonna Mayer (Sciences Po-CEE, CNRS) discusses the pros and cons of these techniques in political science research in general.

Paul Marx

Paul Marx first apologizes for not being able to do his presentation in person, due to an injury. He thanks Nonna Mayer for allowing him to participate online. He considers that it is a great and rare opportunity to discuss such concrete empirical questions and notes that he will adopt a very practical perspective and focus on panel data, as well as explain his main struggles in his own research when he uses panel data.

Paul Marx explains where he comes from in terms of his research field. He is a political scientist and a political economist. He has done a lot of work on the relationship between people's socio-economic experiences and their political behavior. He points out that the methodological problems he will discuss are specific to his disciplinary field. They may not be the same depending on where one comes from.

First, Marx focuses on the expected benefits of panel data. The big advantage of panel data is well known: it is the possibility in principle to eliminate time-constant factors as potential confounders. One of the other advantages of panel data is that they provide

[2] Paul Marx has recently published "Income Changes Do Not Influence Political Involvement in Panel Data from Six Countries", *European Journal of Political Research*, 61, 2022, (with Sebastian Jungkunz) and "Off to a Bad Start: Unemployment and Political Interest during Early Adulthood", *The Journal of Politics*, 79 (1), 2017, (with Patrick Emmenegger and Dominik Schraff).

the possibility to approach causal effects. Another potential advantage of having repeated measurements is that one can observe how effects unfold over time. It is one thing to say that X influences or causes Y, and another to pin down the exact temporal nature through which such a relationship, be it causal or not, unfolds over time. It forces researchers to theorize more carefully and precisely the nature of effects and the timing through which they come about. It makes it necessary to ask oneself: what is the expected timing? This can be particularly hard. One example that he mentions concerns the political effects of unemployment. There are very well-established correlations through education or income. But how exactly do those links evolve over time? This is very often unclear, and it must be theorized beforehand.

With different hand-drawn illustrations showing the possible political effects of economic variables (no effect, transient effect, reversed causality etc.), Marx proceeds to show that most of the time, a longer time span is really needed in order to observe their influence. Short-term perspectives only catch transient effects. The basic point is that neither the map nor the various data typically used, are very good for studying those theoretical scenarios.

To illustrate this idea, he shows a graph from a recent paper[3] about long-term income trajectories and the evolution of political attitudes. The paper is about the influence of income on political preferences. What is interesting is that the paper shows different theories and different life-cycle arguments about how long-term income changes might affect political values. Without going into the exact argument of the article, Marx explains that if we look at the X-axes, we can see that they extend over rather long time periods spanning not only years but decades.

Then, he shows another illustration that comes from his own research.[4] He is interested in the political effect of early unemployment over the life cycle. The argument is that people are socialized to be politically interested or disinterested. Unemployment at some later point in life does not really make a big difference but it can have a large

[3] Agnar Freyr Helgason and Philipp Rehm, “Long-Term Income Trajectories and the Evolution of Political Attitudes”, *European Journal of Political Research*, 62 (1), 2022, p. 264–284.
[4] Paul Marx, Patrick Emmenegger and Dominik Schraff, “Off to a Bad Start: Unemployment and Political Interest during Early Adulthood”, art. cit.

effect in the so-called impressionable years. If unemployment occurs early on, then it can have long-term effects on voting and political interest late in life. To get this result, the authors[5] used difference propensity score matching (PSM), which Marx thinks is a good method. This approach basically consists of matching people, looking for their statistical twins based on pre-treatment characteristics. They wanted to show that life-cycle stages must not be neglected. Ignoring life-cycle stages risks underestimating the effects of unemployment on young workers and overestimating them for older workers. They also wanted to prove that extensive use of cross-sectional data makes it impossible to eliminate unobserved heterogeneity. On the contrary, using German panel data made it possible to show that unemployment represses the growth of political interest in early adulthood, while it does not have an effect later in life. Marx concludes that for a lot of research questions, the long term must be preferred.

Marx then shows a third and last illustration from another recent paper.[6] The authors of this article used what is called sequence analysis. They were interested in labor market entry. Their graphs use different colors to illustrate different labor markets. For him, these graphs are almost humbling because they remind him how complex the empirical trajectories really can be and how they can differ from the more stylized arguments. They show that, for some people, there is hardly any change, they have a very stable integration and do not offer much variation but, for other groups, it is messy and there is no real continuity. Thus, it is not only about becoming unemployed in a given year, but also more over a longer period that some have a precarious integration into the labor market. This illustration shows one of the biggest advantages of panel data: it gives us precise and rich information about people's past in a descriptive sense. Marx concludes that sequence analysis is of great use and should be used more.

Next, Marx focuses on the practical challenge for the type of panel data that one would ideally have. What would primarily be needed are very long panel data sets, ideally covering decades. They should not only be long but also cover different stages of the life cycle. For example, for most political events it makes a difference how old you are when you experience them. Panel data should thus include all relevant stages of the

[5] *Ibidem*.
[6] Liao *et al.*, "Sequence Analysis: Its Past, Present, and Future", *Social Science Research*, Elsevier, Amsterdam, Vol. 107, 2022.

life cycle. A lot of panel data start when people are sixteen or eighteen; they do not study people before, at fourteen for example, although this could be of interest. The second challenge is that a researcher needs rather large panel datasets. This would allow the researcher to capture heterogeneity in complex trajectories. From a political science perspective, there is also a need for "rich" panels. Most current panels do not include many variables and Marx considers this to be unfortunate. Eventually, he points out that researchers really need high-quality panels, in order to minimize/correct for non-random attrition, that is to say the gradual defection of panelists. The survey instruments that are used should be questioned and theorized far more.

Marx illustrates some of the challenges mentioned above with a table from one of his previous articles.[7] In this paper, he and his colleague wanted to go beyond the typical thing political scientists do when they use panels, which is to use just one panel dataset (or maybe two or maximum three). On the contrary, they tried to use as many as possible. They were interested in seeing whether or not income influences political involvement. In the table's columns, there are panel datasets, and in the rows are theoretical constructs that Marx and his colleague found interesting in order to measure political involvement. He considers that the coverage is in many ways unsatisfactory. Based on the table, political interest appears to be a very popular variable while many other variables are not very well covered. He considers that it is very hard to undertake a panel data analysis based on the datasets they used.

Marx concludes that one of the great challenges – at least from his political science perspective – is that the type of panel data available is not always adequate to reflect the existing theories.

He finishes his talk with a brief discussion of the models he used. In the social sciences, researchers tend to have a strong preference for fixed-effects models. Fixed-effects models are a great way to address different temporal patterns. But there are a lot of other alternatives. Sometimes, fixed-effects models appear to be a sort of default option in the social sciences. First and foremost, this is because most panels, by

[7] Sebastian Jungkunz and Paul Marx, "Income Changes Do Not Influence Political Involvement in Panel Data from Six Countries", *EJPR*, 61, 2022, p. 829–841.

design, focus on short-term effects. Marx thus wonders why research is dominated by fixed-effects estimation. He can only speculate but he thinks that it is because these models are easy to implement. They also allow for a quite straightforward interpretation. It is probably also because they appear legitimate from a causal-identification perspective. They work with a limited number of waves – not necessarily well with short panels, but they do work. However, they circumvent the complexities discussed above. For Marx, when he analyzes panel data the fixed-effects models do not seem to be the ideal method for what he wants to do, even though they offer great advantages. What are the main risks of uncritically relying on fixed-effects estimation? One of the big problems is their exclusive concern with within individuals or groups-variance (as opposed to between-individuals or groups variance). They control characteristics that are constant over time. But they leave aside unobserved characteristics that do vary over time. In many cases, at least in political science applications, they have a low statistical power because observations without change are dropped, which means that you have large standard errors. One of the things that is rarely discussed is the risk of distorting a sample by not including a case that experiences change. One would move from a representative sample to a non-representative sample. Often, stable factors causing (differential) change are ignored. There are also big debates about whether fixed effects can deliver causal identification. In many cases, one needs to make the assumption that there are no time-varying confounders, no reverse causality or feedback effects, and no carry-over in the sense of past treatments influencing future outcomes. There are also risks of bias and measurement errors (non-random attrition, panels effects, measurement of noise or substantial changes).

Eventually, Marx considers that many statistical methods including fixed effects invite a certain complacency. We are easily satisfied with controlling for time-constant confounders, though it creates a black box into which we put meaningful variations. Most of the time, the big advantage of panel data, which is theorizing temporal patterns, is sacrificed.

To summarize, the major challenge of using panels is reconciling complex theoretical arguments with the very massive amount of data they provide. Political scientists could do better at embracing this complexity. Research questions should address time

explicitly. Long-term effects should be differentiated from short-term effects. One should be clear about which data structure would be required. Practically, this idea of embracing complexity means to do more descriptive work with panel data. Panel data should be used to describe people's past before we move on to the more ambitious task of designing causal tests. Model selection should be discussed carefully. Collectively, social scientists need to invest in better panel data (that covers different countries and all stages of the life cycle for example).

Nonna Mayer

Mayer thanks Paul Marx for his presentation, showing very clearly the immense advantages of panels compared to cross-sectional surveys. One current major challenge for the social sciences is to know whether or not it is possible to measure change and how to make causal inferences. It is for this kind of problem that longitudinal individual-level data (on the same people if possible, and on the largest number of people) are unvaluable. She appreciates the way Marx symmetrically points out all the traps of panels (attrition, not the same people being surveyed through time, and so on). He tackled the major and most difficult methodological problem of all – how to consider within and between individual effects concurrently – while warning about the dangers of fixed-effects models. Marx's panel-based results seem to her both solid and counterintuitive: they show that income changes have no impact on political involvement: people's political habits were formed long before their income changed.

Next, she asks Marx a series of method-oriented questions.
The first concerns the representativity of the original panel sample. She wonders to what extent Marx takes that into account, and how can one remedy the situation if a panel is not representative from the start. The problem is similar if not worse when one refreshes and replenishes an initial sample.

Another question is about the mode of administration of the survey and more specifically the reliability of access online panels, which tend to be gradually replacing face-to-face surveys.

Mayer asks Marx if he has considered taking models of analysis from other disciplines, such as epidemiology (survival analysis), or analyzing sequences with optimal matching analysis. She also wonders about possible missing variables. Age, education income and labor force status are included in all the models he presented, as well as sex and migration status in the hybrid models (plus race in the US data), But other variables could have been of interest such as family political orientation, for instance, or economic assets (property, shares) ("patrimoine" in French), or sociological variables, social networks in particular which are the micro foundations of turn out as shown by Steven Rosenstone and John Mark Hansen in the US or Céline Braconnier and Jean-Yves Dormagen in France[8].

Mayer suggests other forms of political socialization, taking place after childhood (work, marriage), and other forms of political involvement, that Marx did not take account. She points out that Marx mostly worked on party politics and electoral involvement: leaving aside protest, or other contentious forms of politics. In demonstrations there are people demonstrating for the first time, discovering politics. For instance, Muxel with her youth panel shows how the demonstrations of students in 1986 had lasting political effects.[9]

Noting that Marx suggests people's political interest and habits form earlier in their lives, Mayer asks when this process occurs, if it is in the impressionable years of adolescence, or after. She recalls on this topic Muxel's youth panel showing the importance of the "political moratorium", a long period between 22 and 33 years old, where young people experiment before steadying their political orientations and behaviors[10].

Finally, Mayer asks whether Marx looked for generational effects, beyond comparing age groups.

[8] Steven J. Rosenstone and John Mark Hansen, *Mobilization, Participation, and Democracy in America*, New York, Macmillan, 1993; Céline Braconnier and Jean-Yves Dormagen, *La Démocratie de l'abstention*, Paris, Gallimard, 2007.

[9] Anne Muxel, "Les choix politiques des jeunes à l'épreuve du temps. Une enquête longitudinale", *Revue française de science politique*, 51 (3), 2001, p. 409–430.

[10] Anne Muxel, *Les jeunes et la politique*, Paris, Hachette, 1996.

Marx's responses

Marx answers that he also is concerned about how representative the surveys he uses are. Even with high-quality datasets, there are problems with recruiting certain groups of people. Some people are hard to target in surveys. This is a problem that gets worse over time. Therefore, it is beneficial to use many different panel datasets. Marx also agrees with Mayer's concerns about online surveys. He thinks it would be very helpful to look at other disciplines and to use, for instance, sequence analysis models. The branching out of different methodological possibilities is enormous and time-consuming, it is a full-time job, though an important one. Every time a factor is included in a survey, a huge amount of information is lost because some things, like belonging to networks, are usually not measured well.

Comment from Janine Mossuz-Lavau

Mossuz-Lavau (Sciences Po, CEVIPOF) adds another factor to think about: the political impact on their parents of children becoming adults, a reverse socialization effect to take into consideration.

Marx's response

Marx points out that, in terms of political socialization, a very fundamental question is to find out whether people are socialized into political apathy or into some form of political involvement. He considers that there are many fundamental things that happen quite early. For political orientation, however, contrary to political participation, later periods in life seem more important. He agrees with Mossuz-Lavau that children can have a political influence on their parents, and regrets that there is not more research on this specific topic.

Question from Adrien Degeorges

Degeorges (Sciences Po, CEE) asks Marx if he thinks that life-cycle effects change our perspective on radical right voting. He asks for recommendations of countries or datasets that would be helpful to someone who wants to study the extreme right. Then he wonders about the relevance of Marx's reflections on life-time effects for the study of modern politics.

Marx's response

Marx explains that he has not done any research on this specific topic, so he can only speculate. He would expect life-cycle effects to be huge. Absolute poverty is not necessarily something that moves people toward voting for the political right. Being in a precarious lower-middle-class position and following a trajectory from a desirable or "ok" situation to something significantly worse is something that can lead to support for radical right parties. Marx notes that one does not suddenly vote for the Rassemblement National; it is something that happens over decades. It would be very difficult to identify typical sequences of events leading people to support the extreme right because there would be so many variations. Marx argues that Denmark, Norway, Sweden or Finland would be good countries in which to lead these surveys, because they have major radical right-wing parties, they have parties experiencing changes, and they have good data on electoral registration. He points out that it would be necessary to team up with Scandinavian scholars because they would have access to national data that are quite exclusive.

Question from Nonna Mayer

Mayer asks again if Marx looked at generational effects in his panel data (beyond comparing age groups).

Marx's response

Marx thinks that repeated cross-sections are quite correct to look at already, though he never had a particular research interest in generation effects. Something on which he did focus was whether a more polarized party-system would lead to the politicization of apathetic voters, that is to see if growing up in such a system would matter.

Question from Mathieu Olivier

Olivier from CDSP (Centre de données sociopolitiques de Sciences Po) agrees with Marx that social scientists need to invest in better quality panel data. He would like to know if Marx is worried about the increasing number of commercial panels managed by multinational companies like Ipsos.

Marx's response

Marx answers that he does have concerns about online access panels. He notes that in some cases, of course, online access panels can be useful and that he has used them in the past. Yet after using them his trust in the engagement of participants with the questionnaire and in the representativeness of the samples was very low. Most of the time, he thinks these are a waste of money.

Question from a participant

The participant thanks Marx for his presentation. He wants to know more about his opinion on the usefulness of repeated cross-section studies.

Marx's response

Marx explains that it depends on what one wants to do. If one is really interested in entities above the individual (occupational group, cohorts), it can be better to have repeated cross-sections. They are cheaper, they do not have the problems of attrition or representativeness over time that panels have, one can build with them pseudo panels, etc.

Comment from Nonna Mayer

Mayer draws Marx's attention to the ELIPSS project (Longitudinal Internet Studies for Social Sciences) currently taking place at the CDSP of Sciences Po. She finds it interesting to contrast Marx's considerations with those of ELIPSS. The strength of the project, she adds, is that it is an initiative of social scientists. At the start (2012), panel members were randomly selected by the French National Institute of Statistics and Economic Studies (INSEE) and provided with a touchscreen tablet and a mobile Internet subscription so that they could participate in monthly surveys. It is a high-quality project, producing very valuable data and the results are open access.

Marx's response

Marx apologizes to those who use online access panels, saying he does not want to be too harsh. He agrees with Mayer: online access panels are good for certain things because they allow much more diverse convenience samples than what could possibly be done in a university on students' samples for instance. He also notes he is looking forward to exploring the ELIPSS project more as soon as he can come to Paris.

Mayer concludes by thanking Marx for his presentation which clearly showed the pros and the cons of panel surveys. She thanks all participants for their attendance and questions.