

Synchronising sequence data according to idiosyncratic events: a method to explore relationships between events and temporal structures

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Introduction

Advocates of sequence analysis often emphasises on its holistic approach, as opposed to event history modelling (Abbott & Hrycak 1990, 147; Robette 2010 3). This results from the fact that sequence analysts have mainly focussed on structural patterns, while devoting less interest on events. Most existing studies based on sequence data have indeed concentrated on measuring resemblance in order to identify typical careers (Blair-Loy 1999) or household trajectories (Elzinga & Liefbroer 2007), whereas most endeavours of event history analysts were geared to uncover causal relationships (Blossfeld & Rohwer 2002).

This somewhat antagonistic development of the two statistical methods has translated into a substantial methodological gap: structural patterns and events are most of the time studied separately. As a consequence, few sequence analysts have satisfactorily explored the relationships between events (for example getting married) and structural patterns (for example employment history), and vice versa¹. Particularly striking is the fact that this type of question is deeply rooted in sociological research. For example, the concept of turning point, which accounts for the transition between sequences (Hughes 1996 [1950]) or, in Abbott's words, "between different probability regimes" (1997, 92), is largely overlooked by sequence analysis.

To remedy this problem, this paper provides a simple analytic method that enables combining events and structures in sequence analysis. In so doing, it also offers an opportunity to operationalise the concept of turning point using sequence data. The key operation of this method consists in synchronising sequence data according to idiosyncratic events. This means that each sequence (e.g. job positions) is positioned according to an event that takes place in a particular time for each individual (e.g. getting married). The method therefore does not require applying optimal matching or similar algorithms, nor does it preclude them either.

Two empirical cases will illustrate the heuristics of this practice of sequence analysis. The first one shows how the division of academic labour in the UK is tied to career patterns (Paye 2011). Sequences of "research-only", "teaching-only" and "teaching and research" job positions of 134 individuals are synchronised at the date of permanentship (i.e. access to the permanent workforce). Sequence visualisation shows that academic careers tend to converge towards polyvalent jobs before permanentship, and then diverge anew. Division of academic labour appears to result from career differentiation. This research outcome would have been difficult to demonstrate with more standard uses of sequence analysis.

The second case is a comparison between female and male social mobility following employment abroad. Sequences of occupational status of French individuals (from the

¹ Exceptions are recent works building on multi-channel sequence analysis, which are discussed in part three of this paper.

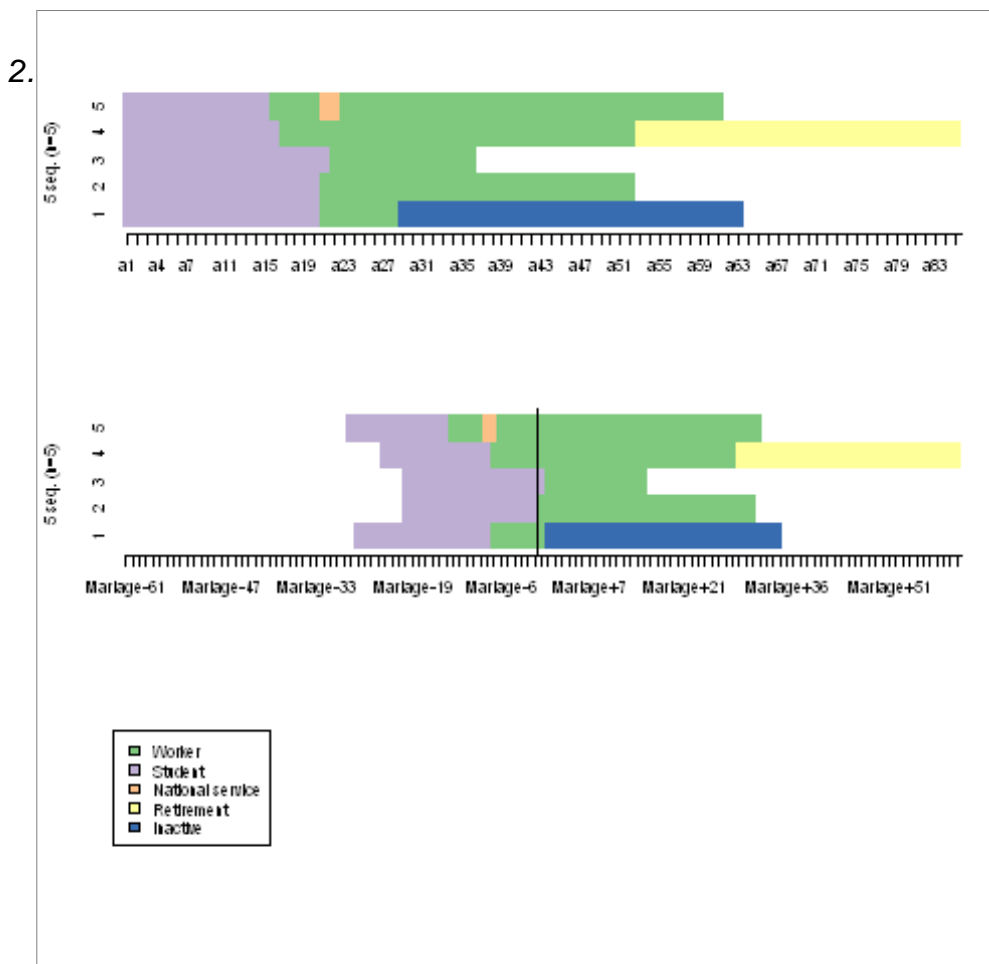
“Histoire de vie 2003” survey) are synchronised at the year of first job. Then we compare patterns of two sub-populations: first job in France and first job abroad. The distribution of states following reinstatement is considerably stable for males. Within the female population, as time elapses, the structure of occupational status shows a constant increase of out-of-work situations. The application of the synchronising method reveals that expatriation affects the whole career, a result that would have been difficult to achieve through other analytic methods.

The first section of this paper details the operation of synchronisation and considers a number of practical as well as methodological issues. The next section presents the two illustrative cases and their contribution to their respective research fields. In section three, the added value of our approach is discussed with reference to two other existing methods: event history analysis and multichannel sequence analysis. A short conclusion comes back to the initial problem and opens up a number of questions that would deserve further attention.

1. Synchronising sequence data

In this first section, we provide a general presentation of our approach and the objectives it can fulfil.

Data are generally left (Lemerancier 2005) or right aligned (Blair-Loy 1999, 1358). We propose another type of alignment: according to a specific event. No previous studies, as far as we know, propose this type of synchronisation. The graph. 1-1 illustrates the type of transformation we made on the “Histoire de Vie 2003” survey—: we consider professional careers, and we re-organise the data according to the date of (first) marriage. In this case, “marriage” is not an element of the sequence's alphabet.



cases

In this section, we present and discuss two illustrative cases.

Case 1: How division of academic labour is tied to career patterns

Case 2: Consequences of employment abroad

3. Sequence synchronisation compared

In this last section, we turn to discuss some of the strengths, pitfalls and weaknesses of our approach with regard to two other methods to analyse longitudinal data: event history analysis and multichannel sequence analysis.

Conclusion

Sequence synchronisation appears to be an efficient analytic method to explore the articulations between events and structural patterns, thereby complementing the other existing methods. Indeed, synchronisation allows studying both how events are conditioned by previous sequences of states, and how in turn events reconfigure the range of possibilities within subsequent temporal structures.

The two examples, as different as they are, both relate to life course research. The scope of application of our method, however, is not restricted to this field. We argue instead that sequence synchronisation to idiosyncratic events can be useful for a variety of research areas, such as time use research or analyses of historical processes.

Last but not least, this synchronising method raises several epistemological and methodological questions that would deserve clarification. What are the epistemological and ontological implications of synchronising individual sequences according to idiosyncratic events? Can we answer to these questions in general terms, or do they always depend on the substantial issues addressed in the enquiry? These are fundamental issues we would be happy to open up for discussion.

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