Do children's life course patterns resemble the parental ones? A multichannel sequence analysis approach on the transmission of life course patterns

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Introduction

Intergenerational transmission is a very vast field of research that has been studied from many angles, yet based on the reviewed literature it still has to be studied from an integrative perspective. This study tries to offer this kind of perspective by analyzing 3 parallel running sectors of life at once, in order to identify if a parent to child transmission of life course patterns does occur.

Life course theory emphasizes that the research focus should be on the timing and sequencing of transitions, rather than on isolated transitions. Further, researchers agree that life trajectories in different life sectors influence each other and one has to look at the interplay between them and not just at one trajectory at a time (e.g. Pollock 2007). Yet most research in this area has focused on the transmission and timing of a specific event (e.g. cohabitation, marriage, divorce, child bearing, or attained education) rather than on the succession of transitions that form trajectories and life patterns. There is enough empirical evidence to sustain the acceptance of a transmission of isolated transitions and the idea that life transitions of the parent influence the children´s behavior and future decisions (e.g. Amato & DeBoer 2001, Teachman 2002, Black et al. 2005, Sassler et al. 2009).

Some attempts have been made to look at a complete trajectory and to see if a parent to child transmission occurs. Liefbroer & Elzinga (2011) looked at the parent-child transmission of family life trajectories and found enough empirical evidence to conclude that it does exists. Fasang & Aisenbrey (2012) using a different method, also analyzed the transmission of family life trajectories and found similar results.

It has to be specified that because of the differentiation and de-standardization of life courses (e.g. Gerson 2006, Bures 2009), the timing of the events between parents and children may

appear to be off, but the possibility that the choices get perpetuated across generations remains unchanged. It only adds to the complexity of the analysis.

So, based on the reviewed literature, the intergenerational transmission of life course patterns has yet to be fully studied. Theoretically the existence of this kind of transmission is very plausible, based on the empirical evidence found for the isolated transitions one could infer the existence of such a transmission at certain level of pattern similarity. It is very plausible that the transmission of isolated transitions is only part of a bigger life pattern that parents transmit to their children as such. I plan to look at the interplay between 3 trajectories: education, work and family formation (with 2 dimensions: living arrangements and children). The combination of these 4 dimensions will form the individual life course patterns for parents and children.

Data and Methods

The used data came from the National Study of Family and Households (NSFH). The NSFH started in 1987 as a longitudinal survey of a representative national sample of American households and ended with Wave 3 in 2003. The data contains extensive information on primary respondents and among others on a randomly selected focal child. The key features of the NSFH are: its representative large sample, the multi-actor design, the vast life history data that was collected, and its focus on family dynamics. The study's major drawback is that most children were at the end of the study still in their mid-twenties, which explains the focus of this study on young adulthood.

For both parents and children the sequences corresponding to the 4 dimensions were reconstructed based on the retrospective collected life history data. For each month a state combination resulted out of the 4 dimensions. For each combination a score was attributed, ranging from 1 to 72 possible state combinations. The interviewed children were of different ages, ranging from 18 to 34. In the analysis only the children that reached at least 29 years and going up to 34 years were included. A total of 250 months were reconstructed, were moth 0 corresponded to the month when they turned 14 and ranged up to 250 months which correspond approximately to 34 years. All sequences for both parents and children were cut at the same length of 250 time measurements. Because more than one dimension is to be studied, a multichannel sequence analysis based on Optimal Matching (Pollock 2007, Gauthier et al. 2010) was employed. Up until now, in sequence analysis, this OM based multichannel analysis method

is the one that can handle analyzing multiple dimensions in the most promising way. It is important to mention that this method treats the parents and the children as two separate dimensions (channels) and computes the final distance matrix by summing up the children-children distances with the parents-parents distances. The interesting part about this way of approaching the distance calculation is that one obtains the way the children relate to the other children and the way the parents relate to the other parents. And from both one then obtains the way one child relates to another child plus the way his parents relate to the parents of the other child. This gives a better view on how they relate to the other members from their generation but held in respect to each other due to the summation. Because the actual distances between parents and children are also of great importance for this study, they were computed in a separate procedure using the same method but with a different function designed for extracting these distances.

For all the analysis the TraMineR (Gabadinho et al. 2011) package from the open source R statistical software was used. From the several attributes available in this package for distance computation, I chose the OM with a self-defined substitution cost matrix, which was considered to best fit the used sequence data. This matrix follows a rather simple computation rule with costs ranging from 0.5 – corresponding to one state that is different, to a maximum cost of 2 – corresponding to all 4 states being different. This was done so that all 4 dimensions are as such taken into account and are not treated as a single component. Treating it as a single component would result in maximum dissimilarity among two persons even if for example in one point in time 3 states were common from the 4 dimensions. In this way the reality is better suited, without placing too much theoretical emphasis on the transitions to different states.

Preliminary Results

The aim is to clarifying if one can speak of a perpetuation of life course patterns across generations. The presupposition would be here, that the life course patterns for parents and children are more similar. This can be tested by comparing actual distances between parents and children with the distances for randomly paired parents and children. I computed the actual distance between parents and their children using the above mentioned OM method with the self-defined substitution cost matrix. The mean actual distance between parents and children was 0.70 – this value can vary from 0 max similarity to 2 max dissimilarity. 5 different parent-child

pseudo couples were built as a comparison value (for more details see Kenny et al. 2006) and their distances computed using the same method. Parent-child pseudo couples represent occurrences by chance and result from paring random parents with random children. Again the presupposition was, that under the right circumstances life course patterns get perpetuated across generations, so parent-child life course patterns are expected to be more similar than for randomly paired parents and children. The mean distance for the 5 pseudo couples was 0.74. A t-test was then performed, and the actual parent-child distances were compared with the mean

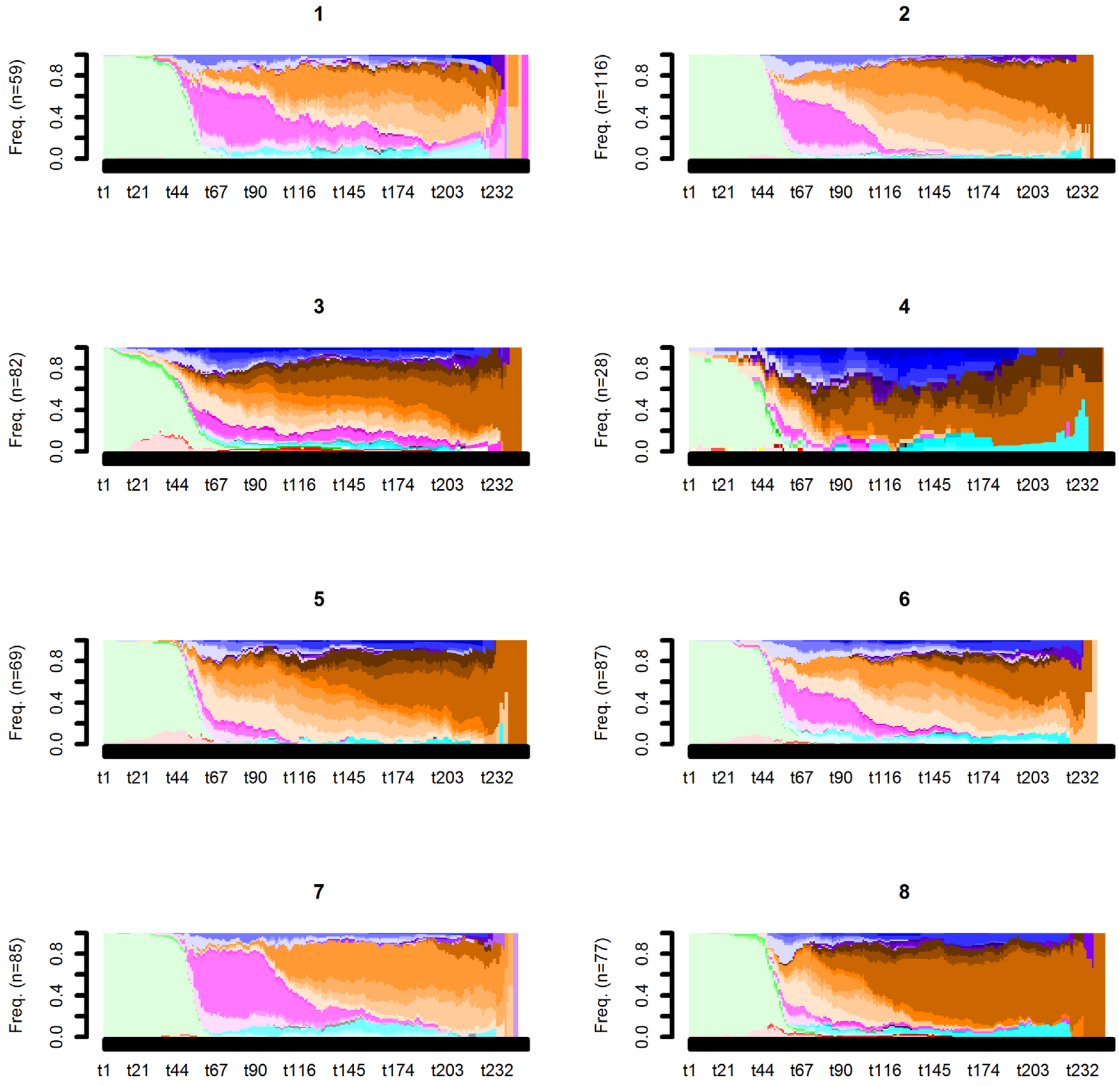

Fig.1 Children's state distribution plot, by cluster

actual distance differs from chance, parents and children's life courses are more similar than for randomly paired parents and children, so under certain conditions life course patterns get transmitted across generations. Although this is a very significant result for this study, it does not say very much and it does not really bring us much further. Out there, there are a large variety of options that people have when constructing their life courses, but still one can identify and group typical successions of life events that form one's life course. Because of this, running cluster analysis and looking at the different groups of life course patterns and in what degree they get transmitted across generations seemed as the most simple but appropriate next step to take.

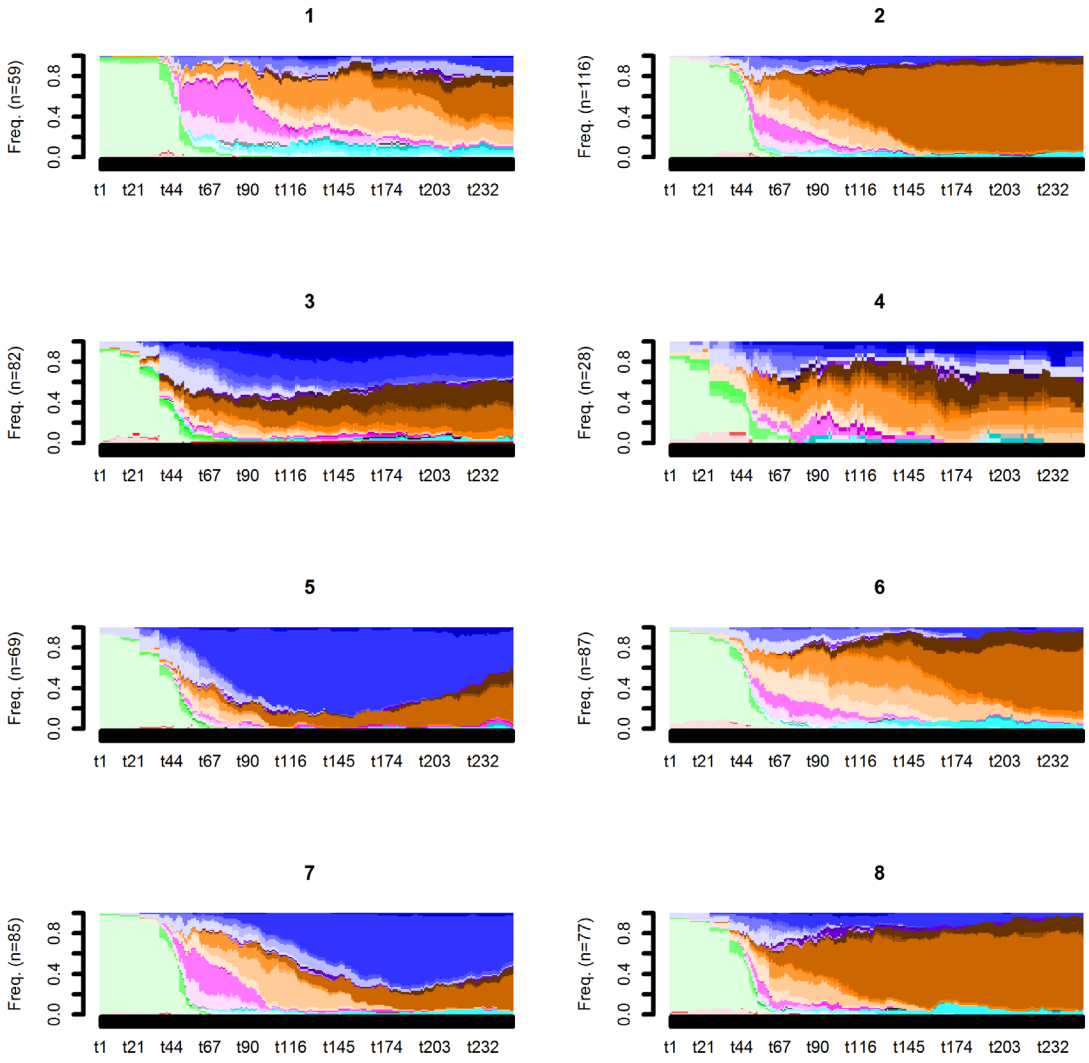

Fig.2 Parents' state distribution plot, by cluster

Ward cluster analysis was run on the computed distance matrix using the above mentioned OM based multichannel analysis method. After the inspection of the dendrogram by taking the height into consideration, a 5 cluster and an 8 cluster solution appeared as plausible. I looked at both cluster solutions and in order to find the most fitting number of clusters, cluster validation was employed. I inspected the sum of squared error, but the elbow plot did not offer a clear bend point, although after the 8 cluster solution the reduction of the SSE slows rather rapidly. I then further looked for both cluster solutions at some popular cluster statistics and compared: the cluster diameters, the average silhouette widths (Rousseeuw 1987), Pearson gamma (Halkidi et al. 2001), entropy and within-between cluster ratio. Based on these statistics and on the composition of the 2 cluster solutions, the 8 cluster solution was accepted as fitting the data best. I then reran the cluster analysis procedure using the k-mean partitioning method for 8 clusters. The graphic representation for the 8 cluster solution was plotted separately for the children (this can be seen in Fig.1) and for their parents (in Fig.2) so that comparisons can be made. The different colors represent the different state combinations, their interpretation and the state legend can be seen in Fig 3.

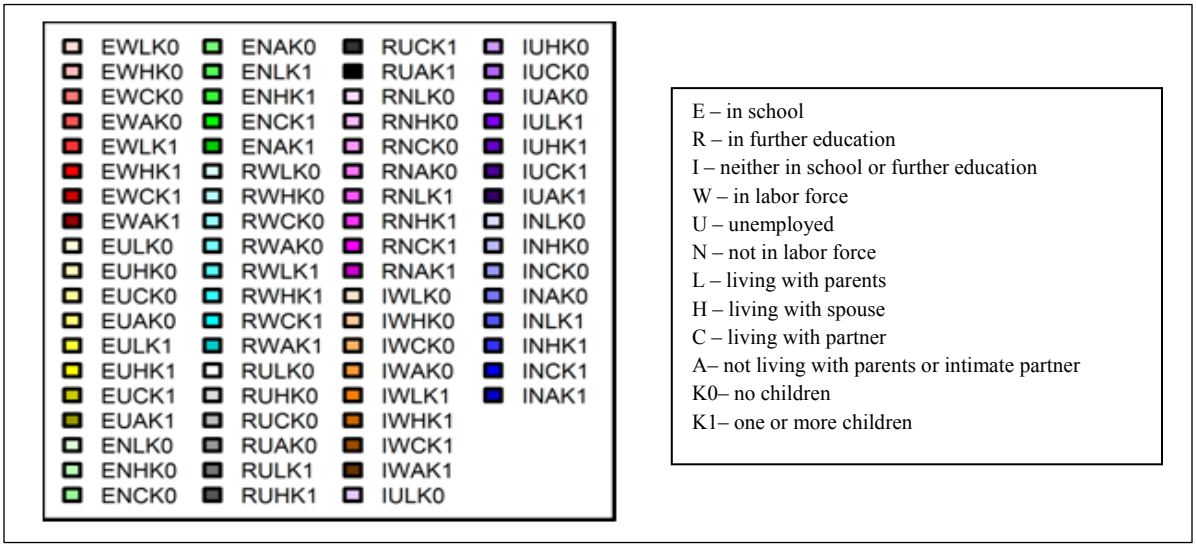

Fig.3 Status color coding and legend

The focus of this study is on transmission, so one has to look at the possible types of transmission that can take place. Theoretically one could accept the existence of three types of transmission: strong transmission, moderated transmission and a failed transmission (the existence of hybrid transmission cannot be excluded). Here two components make the

difference: existence and the timing of the studied events. For the strong transmission same similar patterns are expected between parents and children, in both the existence of state combinations and timing of events. For the moderated transmission somewhat similar patterns are expected, corresponding to same state combinations in parent and children's sequences but at a different timing. In case of the failed transmission completely different patterns are expected, which would indicate that the children made totally different life choices.

The 16 resulting distribution plots for parents and children indicate the existence of all 3 types of transmissions: strong (6th and 8th cluster), moderate (1st and 2nd cluster) and failed (3rd, the 4th, 5th and the 7th cluster). In order to consolidate these findings the actual parent-child distance for each of the 8 clusters was computed (see Table 1 for details). This was done in order to validate the presupposition that in the case of the clusters where strong transmission patterns can be observed the actual parent-child distances should be smaller than in the case of the clusters with more moderate and dissimilar patterns, where distances are expected to be proportional higher.

Table1 Comparative results for the 8 cluster solution

Clusters	Actual parents-children distances	Parents-children pseudo-couples mean	Parents-parents distances	Children-children distances
Cl 1 - moderate	0,66**	0,73***	0,69	0,62
Cl 2 - moderate	0,67*	0,72***	0,38	0,51
Cl 3 - failed	0,76***	0,82***	0,70	0,76
Cl 4 - failed	0,80***	0,68***	0,81	0,67
Cl 5 - failed	0,78***	0,85***	0,38	0,59
Cl 6 - strong	0,64***	0,73***	0,56	0,63
Cl 7 - failed	0,83***	0,76***	0,48	0,49
Cl 8 - strong	0,51***	0,73***	0,44	0,50
Mean distance	0.70	0.74***		

Legend: *p<0,1; **p<0,05; ***p<0.001

For each of these distances, I also performed a t-test, in order to see if the actual cluster mean distance differs significantly from the mean actual parent-child distance of 0.70. All clusters mean distances (2nd cluster which was accepted at p=0.059) differed significantly from the mean parents-children distance, indicating that the grouped clusters have something that makes them unique and differ significantly from the mean combinations of states. As will be seen below, for the clusters where the parent-child patterns were more similar, the actual distances were also smaller with respect to the actual distances for the cluster with more distinct patterns which were proportionally higher. I also extracted the parents-parents and children-children distances (see

Table 1). These distances show how homogenous a group is, the smaller the distance the more homogenous the group.

The plots for the 3rd, the 4th, 5th and the 7th cluster depict for parents and children rather dissimilar patterns, the state combinations for both parents and children differ a lot. Different life choices as the ones made by the parents are made by children, indicating a failed transmission. The actual parent-child mean distances range from 0,76 to 0,83. I will describe 2 of the 4 failed transmission clusters, corresponding to the min. (0,76) and the max. (0,83) actual parent-child cluster mean distance. In cluster 3 (0,76) children have mostly no children (if they have children then this happens rather late), live in different living arrangements (some marry but again rather late) and almost all children start working after finishing their education. For their parents the state combinations depict that they marry mostly after finishing education, have also one or more children, while some are employed and other are not. In cluster 7 (0,83) the differences in state combinations between parents and children are even more different than in the above described cluster. For children after high school education, further education with no kids and mostly living alone can be observed; followed by employment, no children and a variety of living arrangements; and this for the whole studied period of 250 months. For the parents cluster the state combinations depict another story: some further education but not so long and spread in time, with no kids and living alone; followed in some cases by work, accompanied by marriage and shortly after childbearing and in most cases marriage with one or more children and no employment in the studied period. Cluster 7 is also very interesting because both children and parents represent very homogenous groups among themselves but very different with respect to each other.

In general, for the parents clusters one can observe a specific reoccurring state combination (very strong noticeable in the 5th and the 7th parent cluster) - married with one or more kids and not working (the predominant blue). This rather traditional state combination does not occur almost at all in the children's clusters.

The plot of 1st and the 2nd cluster show some very similar state combination patterns but a different spreading and timing. This would indicate a moderate transmission because the events are taking place, but mostly at a different timing. The actual parent-child mean distance is 0,66 for the 1st cluster and 0,67 for the 2nd cluster. For the 2nd cluster children have a somehow more

and longer further education, than their parents; afterwards both parents and children start employment accompanied in the case of the children by having no children at the beginning and living in different living arrangements, followed by late marriage and childbearing; in the case of the parents, employment is accompanied by different short time living arrangements with no children and more quickly, more parents enter the state combination working and married with one or more children. Because of these timing and spread differences a moderate transmission is indicated. For the 1st cluster both children and parents have a prolonged education with further education, in this time they have no children and live mostly alone; for parents clusters some live with their parents in this time. This period is followed for both parents and children by employment, no children and different living arrangements; only late and in very few cases marriage with children crystalizes. This is the picture that appears in general for both parents and children, the difference is that parents marry more often and earlier and have more and earlier children. This 1st cluster could be seen as a hybrid between a moderate and a strong transmission.

The plots for the 6th and 8th cluster show for both children and parents rather similar patterns of state combinations. Almost the same combinations of states and the same timing can be observed for the whole sequence duration. This would speak for the existence of a strong transmission between these parent-child pairs. The mean parent-child cluster distances are 0,64 for the 6th cluster and 0,51 for the 8th cluster. For the 6th cluster in the case of both parents and children some further education can be observed, followed by employment accompanied by having no children and living in a variety of living arrangements and afterwards late marriage and childbearing. A somehow similar occurrence of state combinations can also be seen in cluster 8. The only difference is that for both parents and children a more pronounced occurrence of working and being married with one or more children appears. Because very similar events take place which lead to similar state combinations and at very similar timings and spreading both clusters indicate a strong transmission.

Testing the actual parent-child distance against the built pseudo-couples showed that parent-child life patterns are more similar than random paired parents and children, indicating that there is something that makes parents' and children's life patterns more similar to each other. The presumption of the existence of a transmission of life course patterns appears now as more plausible. Further, the resulting 8 clusters showed the existence all three types of hypothesized transmission: strong, moderate and failed. Also the actual parent-child distance for the 8

resulting clusters were indeed smaller for the clusters where strong transmission was observed and proportionally higher for the cluster with moderate to failed transmission. So the cluster analysis further consolidates the presupposition that a parent to child transmission of life course patterns does occur, and that there are similar patterns that get perpetuated across generations, which answers in a positive matter the core question of this small study.

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