Pathways to Reproduction in Pre-transitional Europe: A Sequential Approach

Martin Dribe[1], Matteo Manfredini[2], Michel Oris[3] and Gilbert Ritschard[3]

[1]Centre for Economic Demography, Lund University

[2]Department of Genetics & Evolutionary Biology, Parma University

[3]Institute for Demographic and Life Course Studies, Geneva University

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Abstract

This paper looks at pathways to reproduction in three pre-transitional societies from a sequence perspective. Rather than studying the final transition in a life course process (i.e. first birth) we compare the full sequence from living in the parental home to having a first birth. Three communities in southern Sweden, eastern Belgium and central Italy are studied using longitudinal individual level data. We link the sequencing of the different communities to well-known differences in family systems between Northern, Western and Southern Europe. The analysis clearly shows the three ideal types: the nuclear family system with life cycle service, the nuclear system with limited life cycle service and the patrilocal family system. However, despite the existence of these ideal types there was also considerable internal diversity, especially in the Belgian and Italian communities, while southern Sweden stand out as the area with the most standardized life course.

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1. Introduction: From Types to Processes

Within the Malthusian framework, the well-being of the population is always threatened by a "naturally" excessive demographic growth in a world of scarce resources. To avoid the positive check of mortality, the prudent restraint of marriage appeared as the only efficient option. From the second edition of his famous Essay, published in 1803, Malthus had this intuition that was considerably strengthened one hundred fifty years later by Hajnal (1965) when he drew a line going from Saint-Petersburg to Trieste and identified on the West side the so-called European Marriage Pattern of late marriage and high proportion of final celibacy. From the 1960s onward, Peter Laslett and many followers demonstrated that nuclear households were dominant in this area since centuries (e.g. Laslett 1963; Laslett and Wall 1972). In an effort that revealed to be decisive for a proper integration of the historical demography and family history perspectives, Hajnal came back in 1983 with a paper on household formation that described the central position of the life cycle service in delaying the age at first marriage while providing different forms of capital to young adults, and distancing the generations before a neolocal establishment. Todd (1990) showed, however, that in several parts of preindustrial Western Europe there also existed a nuclear family system without life cycle service, as well as stem family societies, a multiple family household system, and some marginal types. This last synthesis has been severely criticized and in 1998 Wall and Fauve-Chamoux explicitly stated that they could not provide a better alternative and that it was better to give-up. The typological approach reached a dead end. However, demography moved from the populations to the families and offered its analytical tools to investigate the associations of behaviors and structures forming processes at various moments of the family life course. Recent research focuses on configurations and living arrangements, as well as on multivariate statistical approaches about the factors explaining timing and prevalence of several transitions along the life course, transitions that, however, are considered isolated from each other.

In this paper we look at household formation processes from a different perspective than most previous research in this area (see, however, Bras et al. 2010). Much previous research view marriage as the most important regulator of population growth in preindustrial Europe, but is no longer studied as an isolated event; its interaction with mobility and role in the household formation are widely taken into account by historians. Italian and Spanish scholars have been pioneers and also the more explicit while looking at the impact of various migration systems on family lives and demographic regimes (see the section about Casalguidi below). Carlo

Corsini (2000, 18) concluded: “Any family system could not maintain itself but through controlling marriage and migration solutions. Migrations and marriage appear to be the most sensitive and important factors of family behavior … in historical populations, characterized by 'natural' fertility and when mortality is depending mostly on external elements”.

In this paper, marriage is seen as one important life course transition, others being leaving the parental home and first birth, and their calendar and successions forming trajectories. We use of individual longitudinal data for three different European communities: Casalguidi, a large rural village in Tuscany; two rural communities in East Belgium (Ardennes and the Pays de Herve); and five rural parishes in Scania in southern Sweden. All communities can be considered as preindustrial and pre-transitional in the period of concern here.

Through a sequential approach we want to overcome the intrinsic difficulties of comparing family formation patterns (marriage and transition to first birth) in time and space. Intrinsic since the legal or religious nature of marriage, as well as its economic function, varied greatly throughout cultural, social and economic areas. We consequently propose an alternative approach. All societies have formal and socially accepted events sanctioning transitions from one stage of life to another. Marriage has always represented one of the most important transitions in the individual life course, both in past and in contemporary societies (Hareven and Masaoka, 1988). Indeed, we believe that a correct approach to comparative studies on family formation and its role across different societies and populations should begin from the fact that in almost every society, marriage represented the socially accepted access to reproduction, and was consequently an essential precondition for the biological survival and continuity of families and populations. In this respect, marriage should be seen as a transition point on the “road to reproduction” and analyzed in relation to other turning points in the life course, i.e. leaving home, first birth, household headship, inheritance transmission (Shanahan, 2000).

In a previous paper (Dribe, Manfredini and Oris forthcoming) we partially challenged the famous East-West difference in family formation. While the maximum difference in mean ages at marriage between the studied populations was 12 years for men and 14 years for women, the corresponding maximum difference in age at first birth was about 8 years for both men and women. Looking instead at the difference between the European population closest to Asian standards in terms of ages at first marriage and first birth, the differences for first

marriage was about 9 years for men and 10 for women, while the corresponding differences for age at first birth was 5 and 6. Thus, even though Asian families started reproduction several years earlier than European families, the differences were considerably less for age at first birth than for age at first marriage. In other words, we see considerably more similarities in family formation when looking at the start of childbearing than when only looking at marriage.

Secondly, only for the European samples and one Japanese population, we draw a first picture of the trajectories to legitimate reproduction trough a simple alphabet (lh=leaving home, fm=first marriage, fb=first birth) and a sequential structure (- means a succession, / a simultaneity of events). Results shown in table 1 illustrate the many roads young people could take to reach a first legitimate birth and already demonstrate that although a wide literature opposes collectivist Asian societies to individualistic European ones, the Asian had not necessarily the most ordered life courses and a high variety of possible trajectories existed within Europe, and even within some European societies.

Table 1 here

Although we were happy with those first results, two limitations have to be acknowledged. First, we just observed the sequences between the events but not the spell duration. In other words, the roads to reproduction "lh-fm-fb" could hide very different situations; one in which people left home at 14, stayed in life cycle service during 15 years before a marriage at 29, while in another those values could have been respectively 18, 2 and 20. Second, if we cross-tabulate the possible trajectories to first birth with socioeconomic status (SES), sample sizes diminish which makes it impossible to interpret the results.

In this paper we make use of an innovative approach within the statistical toolkit of life course studies, i.e. sequence analysis. Our main objective is not only to compare across settings but essentially to look at internal variance within each population considered, and to explore the relationships between family systems and socioeconomic structures at a micro level. Using optimal matching to systematically analyze the trajectories and cluster analysis to classify them, we demonstrate that internal variations are important to understand family and economic systems and must be part of a comparative exercise.

2. Data and Methods

Local Sources and Data

The analysis is based on 34 year long yearly state sequences from age 12 to 45 for three regions: Scania (S), Casalguidi (I) and East Belgium (B).

Life-sequence data have been reconstructed through different techniques according to the types of sources and information available in each country. Differences concern also the way in which SES was reconstructed according to socioeconomic information available on the respective country sources.

In ***East Belgium*** two samples have been integrated, one in Ardennes with the parish of Sart and one in the Pays de Herve with a cluster of three municipalities (Charneux, Clermont, and Neuchâteau) (Neven 2003). Life-sequence data from 1812 to 1900 have been reconstructed from the source that made the wealth of Belgian historical demography, i.e. the population registers. This data source is based on a census, then each household sheet was copied on one page in a large book where each individual was listed with mentions of family name, given name, age or date of birth, birth place, matrimonial status, relation to the household head, occupation. The greatest originality is that during ten to twenty years (until the next census) all the demographic events were added with their exact date: deaths, out-migration, marriages. In case of birth, a new line was written at the bottom of the household description. The same for an individual immigrant joining a local household while an immigrant new family was written on an empty place. Since this updating process was sometimes irregular children who died young are often missing but we used the civil registration to correct this bias. Out-migrants who did declare their exit wee also identified through the linkages of the successive population registers.

However, when a marriage happened and we observed the bride and the groom forming a new household (or one of the spouse joining the household of the other one), we assumed that this mobility happened in the same time that the marriage. In those cases, the simultaneity of events is just the result of a reasonable assumption in a region where the rule of neolocal establishment was the norm.

SES classification reflects both a simple social structure and the absence of systematic tax information in the Belgian local archives. We can but use the occupation which is systematically mentioned in our sources, although it implies many missing data for the

teenagers and for women. The low SES are mainly the daily laborers and other unskilled. The medium SES is the heart of those rural societies since are here the peasants (cultivators, a few farmers). Artisans are in this group in the Ardennes sample and the low SES in the Pays de Herve sample since in this region they are proto-industrial workers and faced quite hard times during the studied period, before of the industrial revolution in the neighboring city of Verviers. An upper class is almost non-existent.

For ***Scania***, the data used is based on local population registers for five rural parishes: Hög, Kävlinge, Halmstad, Sireköpinge and Kågeröd. They are all located about 10 kilometers from the coast of the western parts of Scania, which is the southernmost province of Sweden. The continuous population registers have been linked to vital events to avoid possible under-registration as well as to poll-tax registers (*mantalslängder*) which provide yearly information on landholding. The database contains all individuals born in the different parishes, or migrating into them. Instead of sampling any particular group (a birth cohort for example), each individual is followed from birth, or time of arrival to the parish, to death, or migration out of the parish. In addition to migration over parish borders, the registers allow us to follow individual movements into and out of households, which is a necessary requirement in order to study life course transitions. The data has previously been used to study leaving home (Dribe 2000), family migration (Dribe 2003), marriage (e.g. Dribe and Lundh 2005b, 2009, 2010) and fertility (see e.g. Bengtsson and Dribe 2010).

The selected parishes are compact in their geographical location, showing the variations that could occur in a peasant society with regard to size, topography, and socioeconomic conditions, and they offer good source material. The agricultural sector in Sweden, and Scania, became increasingly commercialized during the early nineteenth century. New crops and techniques were introduced. Enclosure reforms and other reforms in the agricultural sector influenced population growth. The main problem with the data is the high rates of migration which makes the proportion of the population observed for the entire period from age 12 to age 45 rather small. More seriously, however, the study population is highly selected among the more well-to-do landowners, because they were much more likely to remain in the same parish as they were born and raised. This needs to be kept in mind when comparing the results presented here to previous results in the same area.

For Italy, more exactly for the parish of ***Casalguidi*** in Tuscany, data come from crosschecking of information between *Status Animarum* and parish registers of baptism, marriage and death. The first source was a sort of census the parish priest recorded each year by listing all the households who lived within the parish boundaries. The members of each household were listed individually, specifying name, sex, age, marital status and relationship to the household head. The annual series of *Status Animarum* between 1819 and 1859 is available. By integrating such information with life events taken from parish registers, it has been possible to reconstruct household and individual life-histories and to trace life-sequence trajectories between birth of ego and first birth from ego.

While for birth and death we have precise data on event dates, for marriage this is only partly true. In fact, exogamous marriages between local men and foreign women were celebrated in the bride's parish, leaving no trace in local registers. The only information we have is the year in which the newlywed bride entered husband's families on *Status Animarum*. Thus, in some sequences the simultaneity of multiple events is only apparent; actually only the year of occurrence is known, not the precise date. As for leaving home, it is sometimes indirect information. In fact, we assume that individuals who were present at time t but not at time t+1 on *Status Animarum* and who were not recorded on the death register are to be considered as leavers.

Data on socioeconomic status refer to household taxation level. Tax information were recorded on annual basis so that it has been possible to define SES each year individuals spent in the village. Three major groups of taxation were considered: high-tax group, which contains the richest and wealthiest households, the medium-tax group, formed by some sharecroppers, shopkeepers and artisans, and finally, the low-tax group, which is made up by the most indigent and poorest people living in the village such as daily laborers.

Methods

The sequences considered in this study are ordered lists of categorical elements describing the succession of states lived by the individuals. For example, in case of yearly data starting at age 15 and using the codification of table 2, the state sequence H-H-H-LH-LH-M-MC-MC would indicate that the considered woman was living in her parental home until age 17, that she left home at 18, got married at 20 and had a firth childbirth when she was 21 years old.

The aim of sequence analysis is to find out overall and individual characteristics of the whole set of considered sequences. It assumes that a given alignment of the sequence start either on a calendar date or on a process time, as we do it in this paper by setting the sequence start at age 12.

Table 2 here

An important advantage of focusing on state sequences rather than just on the sequencing of the transition between states is that the former can be easily and nicely visualized. In the example above, each listed element of the sequence lasts 1 year (the used unit of time) and can hence be represented by a unit rectangle colored with the suitable state color. Each sequence is then represented by stacking horizontally those colored boxes.

The length of bar segments in a same color renders thus the consecutive time spent in the corresponding state. Putting the bars above each other we get a so called index plot that visualizes the individual sequences and exhibits their diversity. Index plots give however often garbled pictures and more synthetic d-plots that display the sequence of transversal distributions at the successive positions (see for instance figure 1) prove to be more useful for interpretation purposes. D-plots provide some kind of average representation of the sequences but hide the individual and diversity information. Sequence analysis consists then essentially in the study of the diversity of the sequences, which we do in this paper by means of unsupervised clustering, ANOVA-like analysis and regression trees.

Figure 1 here

The diversity is measured from the pairwise dissimilarities between sequences (for details see for instance Studer et al., 2010). We compute the dissimilarities with Optimal Matching (OM). This is an edit distance that defines the distance $d(x,y)$ between two sequences x and y

as the cost of transforming *x* into *y* by means of substitutions, insertions and deletions of states. The value of *d(x,y)* depends indeed on the substitution and indel (insertion or deletion) costs. We set the indel costs to 1 and estimated the substitution cost for each pair $\{i, j\}$ from the observed state transition rates as 2 minus the sum of the transition rate from *i* to *j* and that from *j* to *i*. Doing so makes the substitution cheaper than any insert followed by a delete. Cluster analysis aims at organizing the sequences into homogeneous groups that differ as much as possible from each other. The clusters were obtained by first running a hierarchical analysis from these OM distances by means of Ward's criteria. The medoids of the *k* clusters of the retained solution were then passed as starting point for refining the clusters with the partitioning around medoids (pam) method (Kaufman and Rousseeuw, 2005).

For studying the relationship between the sequences and the considered covariates (gender, SES) we made one-way ANOVA-like analysis for each covariate and grow regression trees on the sequences. As clustering, a regression tree aims at finding homogeneous groups of sequences. Unlike clustering, however, the grouping is here supervised, i.e. the groups are defined in terms of values of the covariates. A tree is obtained by searching first among all covariates the one that permits the best binary split, i.e. the split for which we get the highest R^2. This operation is then repeated locally at each obtained node. The growing stops when the split is not significant (Significance is evaluated by means of a permutation test). We used a 5% p-value limit for Scania, 1% for Casalguidi and 0.5% for the Ardennes. We set also the maximal tree depth to 4.[1]

3. East Belgium

We can immediately move from the theory to practice with the East Belgian case. Ardennes and the Pays de Herve were the two rural areas of this part of Belgium, separated by the river Vesdre where was located a pioneering centre of the industrial revolution in continental Europe, the growing agglomeration of Verviers. That is to say that the two regions experimented in the first half of the 19th century a collapse of their proto-industrial activities and a consequent “ruralization”. After a period of tensions and decline in the economic well-being the second half of the nineteenth century was a time of betterment because the population in excess out-migrated to industrial towns and the growing demand of food from

[1] All calculations were made using the R-package TraMineR, see Gabadinho et al. 2009.

the urban areas benefited to the peasants. The agricultural crisis of 1873-1890 just accelerated ongoing changes (Neven 2002).

Figure 2 shows a pattern typical of a nuclear family system without life cycle service. The "left home" status seems almost absent. We observe several transitional statuses between living in the parental home and having established an independent household: 6 to 9 percent of those who had a first legitimate birth were before unmarried mothers or fathers! This demonstrates the ability of the society to integrate some marginal trajectories and regularize. A stem family phase was also frequent although the normal destination remained the neolocal establishment. It reflects the tension inherent to a demographic regime where age at marriage and rates of final celibacy were extremely high (Alter and Oris 1999; Neven 2003). Considering the absence of life cycle service, women experienced their transitions younger than men, but males and females figures are very similar.

Figure 2 here

Coherently, the optimal matching procedure resulted in a distinction between four "families" of trajectories to first legitimate birth, both for men and women. As far as the former are concerned, the timing of transitions to adulthood is the discriminating factor for the three first groups. Indeed, while the average age at first marriage for males was around 30, type 1 brought together 32 percent of the trajectories having their set of transitions around age 33. For type 2, with almost 39 percent of the population, the turning point was much earlier, with the median around 25 years. Finally, type 3 was less important in size (12.5 percent) and reached a first legitimate birth very late, with a transition phase around age 40! Tamara Hareven explained at which point marriage is a normative transition with a "proper age at marriage" and social stigma on those who did not experience the transition, especially the "old" unmarried. We here observe a clear distinction between those who broke the secular pattern of later marriage and have been pioneers of a modernization in those remote rural areas of East Belgium (type 2), versus those who respected the norm and married late (type 1), while a little group arrived to avoid final celibacy and the biological extinction at the very last moments (type 3). Without surprise, this latter group had the highest density of transitional statuses. Those results are quite original and unexpected.

Figure 3 and 4 here

The last group is not such a surprise although it demonstrates an interesting internal diversity. Indeed, within a dominantly nuclear family system, 17 percent of the males followed the stem family rules, staying in the farm to take over the ownership or the tenure and cohabiting with the old parents until their death. This is the type 4 on figure 3, and as shows this graph, their transitions were less concentrated, more scattered on a wide range of ages from 22 to 38.

The female pattern was similar with 39 percent of women making the transition early and abruptly around age 23 (type 3 in figure 4), while 31 percent had a "late" transition around age 29 (type 1), and 17.5 percent a very late transition around age 37 (type 2). Type 4 brought together those who went through a stem-family phase but also those who had an illegitimate child and were not expelled by their parents (status 'child in parental home'). Perhaps this was this parental / family support that helped them to finally get married.

Figure 5 here

With the sequence regression trees, we wanted to see at which point gender and SES were the factors explaining this diversity in timing and household formation rules. As we can see in figure 5, gender indeed explodes the initial root and divides the males and females trajectories. Rules and distributions were however quite similar, only the more precocious timing of the women doing the differences. Among men, the splitting procedure has separated the few males without occupation and the daily laborers from the peasants and the modest local elites (the middle class). The former have a more abrupt and earlier transition which can easily be understood since daily laborers did not have land or patrimony to preserve. We already observed that they were consequently freer to fix the timing of their marriage and choose their partner (Alter & Oris 1999; Neven 2003) and we find a confirmation on the whole process of transition to reproduction.

4. Scania

The Scanian family system can be characterized as nuclear with a strong presence of life cycle service (see Dribe 2000). Especially among the landless children left home between ages 15 and 20 and worked as servants in different households before getting married in their later twenties. During the prolonged period between leaving home and marriage servants from landless origin worked in a large number of peasant households, often moving every year, or

at least every other year (See Dribe and Lundh 2005a). For landholding peasants (freeholders, tenants on crown land or tenants on manorial land) the situation was different because of a much higher demand for labor in their parental households. They left home several years later than the landless, but it is still clear that a majority passed through a phase of service before marriage and taking over a farm of their own. Because of the strong social selection in the data used in this analysis the pattern shown in figure 6 resembles that of the landed groups, with a rather late age at leaving home and a short period of service before marriage. The nuclear family system is however highly visible in the figure, and the contrast with the Italian community is particularly striking.

It is also clear that the sequence to reproduction differ substantially between men and women, with men leaving home earlier and to a higher extent than women, which also seems reasonable given that we look at a population with a big overrepresentation of landed peasants. Apart from these gender differences, there is not much clustering visible in the data, indicating a rather ordered transition to adulthood; a finding which was also previously made in an Eurasian comparison using simpler methods (Dribe, Manfredini and Oris forthcoming). However, thanks to the optimal matching and clustering techniques emerges a more nuanced picture.

Figures 6 and 7 here

Indeed, figures 7 and 8 show first that the male selected population can be disentangled in three groups and the female one in only two subpopulations, while the same techniques identify four clusters in East Belgium and Casalguidi, for both sexes. This is a confirmation of the homogeneity of the Scanian society where one road to reproduction was highly dominant (table 1).

However, there was some diversity even in this rather coherent social and cultural environment. Among males, in figure 7, Type 2 with 39 percent of the 192 trajectories studied here represents to some extent the ideal type of this nuclear family system with life cycle service with an early age at first leaving home, a long life cycle service and a late age at marriage almost immediately followed by a legitimate birth, a pattern that is associated to low socioeconomic status in Scania (Dribe 2000). On the contrary, Type 1 (43 percent) is the extreme illustration of the landed peasant transitions to adulthood already discussed above.

Type 3 isolates a pattern that was previously perceived (Dribe 2000) and is measured here – with the uncertainty resulting from the social selection of the sample. Some 18 percents of the trajectories to legitimate reproduction concerned male heirs who barely had a life cycle service experience, but stayed at home and took over the farm, contracting a care arrangement with the retired parents. A short stem family phase is consequently present in this pattern. It should also be noted that in most cases stem phases (coresidence with parents after marriage) will go without notice in this analysis because headship was usually transferred to the younger generation upon marriage, leaving the older generation as lodgers with or without a formal retirement contract (Dribe and Lundh 2005c).

Among women (figure 8), the first group is dominant (69 percent of 233 trajectories) and once again express the social selection of the Scanian sample, with a pattern that was typical of the upper class daughters. Inversely, the 73 trajectories belonging to type 2 were typical of the daily laborers with a long life cycle service before a late marriage and access to reproduction.

Figure 8 here

The sequence regression tree, in figure 9, essentially contrasts the internal structures in the Belgian and Swedish communities. Indeed in east Belgium, gender was the first factor of division, then SES, and timing differences were the main source of variation among the groups. In Scania SES created the first node, and it is only within the high SES on one side, the medium and low SES on the other side, that gender appeared as a factor of differentiation. In the various "families" of trajectories we also observe timing variations among the Scanians, but the prevalence and duration of life cycle service was clearly the main element of discrimination among the groups.

Figure 9 here

5. Casalguidi

Casalguidi is a large village in the province of Pistoia that, during the period of our study, was administratively part of the Grand Duchy of Tuscany. Between 1819 and 1859, the population averaged around 2,400 inhabitants, showing a constant growth despite the cholera epidemic of 1854-55 (Breschi and Manfredini, 1998).

Like many other communities of nineteenth-century Tuscany, Casalguidi was primarily a rural society where about 75% of adult people were employed in agriculture. Despite this apparent uniformity, the various agricultural categories were marked by considerable differences in demographic behavior, migratory attitude, family formation systems, household structure, and, finally, socioeconomic status (Barbagli, 1984; Kertzer and Hogan, 1991; Viazzo and Albera, 1992). Especially day laborers, on the one hand, and sharecroppers, on the other, represented the traditional dichotomy of the Tuscan countryside. Sharecroppers, tenants and some noble families married later, followed a patrilocal system of living arrangement after marriage, and lived in large and complex households. On the other hand, day laborers married earlier, had a neolocal family formation system, and lived in simple family groups, formed by only one biological nucleus (Della Pina, 1990; Barbagli, 1990; Rettaroli, 1993). The diffusion of patrilocality among men puts the Italian sharecropping society in a quite different position with respect to the two Northern European populations. This is quite evident in figures 1 and 10, where Casalguidi emerges as the society in which the role of the "Married with child at home" trajectory to first birth for men is most important and relevant among overall sequences.

The differences in the marriage pattern were the consequence of different relations to land (Poni, 1982; Doveri, 2000). Sharecroppers lived on the farm they cultivated for an absent landowner. The contract tied the whole family group to the landowner and provided the equal division of the crop between the sharecropper and the landowner. No member of the sharecropping household was allowed to work outside the farm. Each year the contract had to be renewed and one of the key points was the capacity of the sharecropping household to guarantee an adequate quantity of crop to the landowner (Giorgetti, 1974; Pazzagli, 1973). Thus, one of the main concerns for sharecroppers was to preserve an adequate working force within the household by adopting specific demographic behavior, such as higher fertility, expulsion of exceeding and less productive members, and a patrilocal arrangement after marriage for men.

Day laborers had no immediate connection to the land since they did not live on the farm, but moved around in search of farmers offering them the opportunity to work for some time. When the demand for agricultural labor declined, day laborers could find employment in poor artisan activities, so that the two groups were so easily interchangeable that they had similar

nuptiality patterns and family formation systems. Mobility was their main characteristic, along with neolocality. For day laborers, the familial labor force was not the central factor for finding or maintaining a job, and large households were not fit for their frequent movements and unsustainable for the resources of this social category. As a consequence, the members of those nuclear households, both men and women, left the native family on marriage.

Figure 10 here

Our analysis confirms such an internal dichotomization of this rural society in terms of male trajectories to first birth. More clearly, Type 1 (23 percent of the trajectories) and Type 3 (36 percent) in figure 11 represented such a differentiation in this sharecropping society. Limiting the analysis to figure 11, it is clear that Type 1, which involves the largest share of the Low SES group, represented the typical pattern of daily laborers: People left home, got married and then had a child out of home. Type 3, on the other hand, was typical of sharecroppers and tenants: Men stayed home, got married and had children in their native household. Type 4 (19 percent) is a variant of type 3, but with very late transitions. Type 2 (22 percent) shows people who inscribed their trajectories within the sharecroppers system but to some extent failed, since at the end they left Casalguidi. This is a confirmation that the relatively privileged position of the members of this socioeconomic group was always threatened.

Figure 11 here

As far as women are concerned, figure 12 proves that women usually left home on marriage and then had their first child outside the native household. Departure on marriage could be in some cases preceded by some time spent as a domestic servant outside the native household. This was not unexpected as women had a minor economic role as they had a minor role in fieldworks. Their departure on marriage could be a way to strengthen family alliances and a way to relieve the household economic burden.

If we look more in-depth at the groups of figure 12, type 1, with 14 to 15 percent of the 425 observed trajectories, involves women who lived at home after marriage for some time but then left together with the spouse and children. It would seem a temporary permanence in the parents' house before leaving to live on their own, but the interpretation of this departure is not clear. Types 2 (21 percent) and 4 (36 percent) are quite similar trajectories but missing

data (out-migrations essentially) at the end of type 2 model. This trajectory describes the traditional female pathway to reproduction: women left home on marriage, formed a brand new family (neolocalism) or joined parents-in-law household (patrilocalism). Finally, type 3 reveals a significant (29 percent of the trajectories) and unexpected internal diversity since in this dominantly patriarchal society there were also cases of matrilocalism.

Figure 12 here

The sequence regression tree (Figure 13) confirms the importance of the social stratification in rural societies that were by far not homogeneous. In Casalguidi, like in Scania, the first node is created by SES position, while gender is splitting the groups only at the third or fourth levels. However, the socioeconomic status "H" (in parental home, no indication about the individual occupation) is ambiguous and difficult to interpret. It is obviously not neutral since at the second and third level we find an opposition between members of this "status" and those of low, medium or unknown statuses (level 2) or belonging to all the known SES, low, medium and upper (at level 3).

Figure 13 here

6. Conclusion

This paper is a first attempt to compare the “road to reproduction” in three different European communities using sequence analysis. The paper is still in an early stage and there are some issues of sample selection bias, especially in the Scanian case, which needs to be addressed. Nonetheless, the analysis clearly showed the potential added value of sequence analysis in unraveling differences and similarities of the three communities, which to a large extent would have been hidden using a more standard methodological approach. Looking back at figure 1, three ideal types could clearly be identified: a nuclear family system with life cycle service, a nuclear family system without life cycle service, and a patrilocal/patriarchal complex family system. But looking inside each of these systems, we also discovered that on the roads to reproduction, men and women could respect various set of rules and that in each community, an internal diversity could be demonstrated and measured. On the one hand it remains clear that southern Swedish males and females had the most homogeneous trajectories, but even there landed and landless peasants followed different sets of rules during their transitions to adulthood. In two very different societies, East Belgium and Casalguidi,

the internal diversity was striking, mainly due to variations in the timing of transitions in the former case, and to a complex mix of gendered patterns and life uncertainty associated to the socioeconomic position in the later case. In central Italy, it is especially interesting to observe that within a predominantly patriarchal / patrilocal society, the socioeconomic constraints were more important that the cultural values, so that a significant number of cases of matrilocalism could have been observed. In the next revision of this paper we would especially like to explore how those variations were combined in a more or less efficient socioeconomic system at the community level.

References

Alter G., Oris M. (1999). Access to Marriage in the East Ardennes during the Nineteenth Century, in Devos I., Kennedy L. (eds), *Marriage and rural economy. Western Europe since 1400*, Turnhout, Brepols, pp. 133–151.

Barbagli, M. (1984). *Sotto lo stesso tetto*. *Mutamenti della famiglia in Italia dal XV al XX secolo*, Bologna, Il Mulino.

Barbagli, M. (1990). Sistemi di formazione della famiglia in Italia, 3-44, in *Popolazione, società e ambiente. Temi di demografia storica italiana (secoli XVII-XIX)*, Bologna, Clueb.

Bengtsson, T. and Dribe, M. (2010). Agency, Social Class, and Fertility in Southern Sweden 1766-1865, in Tsuya, N. O.,Wang Feng, G. Alter, J. Z. Lee, et al. *Prudence and Pressure. Reproduction and Human Agency in Europe and Asia, 1700-1900*. Cambridge, MA: MIT Press.

Bras, H., Liefbroer, A. C. and Elzinga, C. H. (2010). Standardization of Pathways to Adulthood? An Analysis of Dutch Cohorts Born Between 1850 and 1900. Forthcoming in *Demography*.

Breschi, M., Manfredini M. (1998). A Tuscany Village: Casalguidi 19th Century. *Eurasian Project on Population and Family History*, Working Paper Series, 21. Kyoto: International Research Center for Japanese Studies.

Corsini, C. (2000), "Introduction", in Neven, M., C. Capron (eds), *Family Structures, Demography and Population. A Comparison of Societies in Asia and Europe*. Liège: University of Liège.

Della Pina, M. (1993), “Mezzadri e pigionali in Toscana: le campagne pratesi”, 413-426, in *La popolazione delle campagne italiane in età moderna*, Bologna, Clueb.

Doveri, A. (2000), “Land, fertility, and family: a selected review of the literature in historical demography”, *Genus*, LVI (3/4), 19-59.

Dribe, M. (2000). *Leaving Home in a Peasant Society. Economic Fluctuations, Household Dynamics and Youth Migration in Southern Sweden, 1829-1866*. Södertälje: Almqvist & Wiksell International

Dribe, M. and C. Lundh (2005a). People on the Move. Determinants of Servant Migration in Nineteenth Century Sweden. *Continuity and Change* 20: 53-91.

Dribe, M. and C. Lundh (2005b). Finding the Right Partner. Rural Homogamy in Nineteenth Century Sweden. *International Review of Social History* 50:S 149-177.

Dribe, M. and C. Lundh (2005c). Retirement as a Strategy for Land Transmission: A Micro Study of Pre-Industrial Rural Sweden. *Continuity and Change* 20: 165-191.

Dribe, M. and C. Lundh (2009). Partner Choice and Intergenerational Occupational Mobility: The Case of Nineteenth Century Rural Sweden. *Continuity and Change* 24: 487-512.

Dribe, M. and C. Lundh (2010). Marriage Choices and Social Reproduction. The Interrelationship Between Partner Selection and Intergenerational Socioeconomic Mobility in 19th Century Sweden. *Demographic Research* 22:347-382.

Dribe, M., M. Manfredini, and M. Oris (Forthcoming). The Roads to Reproduction: Comparing Life Course Trajectories in Preindustrial Eurasia, in S. Kurosu, C. Lundh, et al. *Similarity in Difference: Marriage in Europe and Asia, 1700-1900*. Forthcoming.

Gabadinho, A., G. Ritschard, M. Studer, and N. S. Müller (2009). Mining Sequence Data in R with the TraMineR Package: A User's Guide. Technical Report, Department of Econometrics and Laboratory of Demography, University of Geneva, Geneva.

Giorgetti, G. (1974), *Contadini e proprietari nell'Italia moderna: rapporti di produzione e contratti agrari dal secolo XVI ad oggi*. Turin: Einaudi.

Hajnal, J. (1965). European Marriage Patterns in Historical Perspective, in D. Glass and D.E.C. Eversley, (eds.) *Population in History*. London: Edward Arnold.

Hajnal, J. 1983. Two Kinds of Preindustrial Household Formation System, in R. Wall, J. Robine and P. Laslett (eds.) *Family Forms in Historic Europe*. Cambridge: Cambridge University Press.

Hareven, T. and Masaoka, K. (1988). Turning Points and Transitions: Perceptions of the Life Course. *Journal of Family History* 13: 271-289.

Laslett, P. (1963/1994). *The World We Have Lost, further explored*. London Routledge.

Laslett, P. and Wall, R. (eds.) (1972). *Households and Families in Past Time*. Cambridge: Cambridge University Press.

Kaufman, L. and P. J. Rousseeuw (2005). *Finding Groups in Data*. Hoboken: Wiley.

Kertzer, D.I., Hogan D.P. (1989), *Family, Political Economy, and Demographic Change: The Transformation of Life in Casalecchio, Italy, 1861-1921*. Madison: University of Wisconsin Press.

Malthus, T. R. 1803/1992. *An Essay on the Principles of Population*. Cambridge: Cambridge University Press

Neven M. (2002). Espaces ruraux et urbains au XIXe siècle : trois régimes démographiques belges au cœur de la révolution industrielle, in *Popolazione e storia*, 2, pp. 35-62.

Neven, M (2003). *Individus et familles: les dynamiques d'une société rurale. Le Pays de Herve dans la seconde moitié du 19e siècle*. Geneva: Droz.

Pazzagli, C. (1973). *L'agricoltura toscana nella prima meta dell'800: tecniche di produzione e rapporti mezzadrili.* Florence: Olschki.

Poni, C. (1982). *Fossi e cavedagne benedicon le campagne: Studi di storia rurale*. Bologna: Il Mulino.

Rettaroli, R. (1993). 'Maritu a chi troa, moglie a chi tocca.' Nuzialità e famiglia nell'Italia mezzadrile del primo Ottocento, pp. 505-526, in *La popolazione delle campagne italiane in età moderna.* Bologna: Clueb.

Shanahan, M. J. (2000.) Pathways to Adulthood in Changing Societies: Variability and Mechanisms in Life Course Perspective. *Annual Review of Sociology* 26: 667-692.

Studer, M., G. Ritschard, A. Gabadinho, and N. S. Müller (2010). Discrepancy Analysis of Complex Objects using Dissimilarities, in F. Guillet, G. Ritschard, D. A. Zighed, and H. Briand (eds.), *Advances in Knowledge Discovery and Management*, Volume 292 of Studies in Computational Intelligence, pp. 3-19. Berlin: Springer.

Todd, E. (1990). *L'invention de l'Europe*. Paris: Seuil.

Viazzo, P.P. and Albera D. (1992). La famiglia contadina nell'Italia settentrionale, in M. Barbagli and D. I. Kertzer (eds.) *Storia della famiglia italiana 1750-1950*. Bologna: Il Mulino.

Table 1. Distribution of all possible trajectories (%) from living in the parental home to experiencing a first legitimate birth

	MEN					WOMEN				
Trajectoies	Scania	Ardennes	Herve	Casalguidi	Ou	Scania	Ardennes	Herve	Casalguidi	Ou
lh-fm-fb	59.4	5.9	5.3	15.2	20.3	51.6	4.2	3.2	12.7	12.7
lh-fb-fm	0.4	0.9	0.5	0.6	0.0	0.5	0.4	0.3	0.5	0.0
fm-lh-fb	0.0	6.8	14.4	1.2	7.9	0.0	7.5	17.0	0.8	8.7
fm-fb-lh	0.0	11.2	17.8	3.1	13.3	0.0	11.3	15.2	7.1	13.0
fb-fm-lh	0.0	1.3	2.4	6.8	0.0	0.0	2.0	6.0	0.0	0.0
fb-lh-fm	0.0	0.2	0.3	0.0	0.0	0.0	0.8	0.6	0.0	0.0
lh/fm-fb	12.9	33.1	19.9	15.5	10.1	26.7	34.2	20.5	65.6	37.3
fb-lh/fm	0.2	2.6	1.3	0.0	0.0	0.2	3.8	2.2	1.1	0.0
fm-fb	21.0	34.7	32.5	57.0	42.9	13.1	30.2	28.7	12.2	24.2
fb-fm	0.4	3.1	5.2	0.6	0.0	1.2	5.4	6.1	0.0	0.0
Other	5.7	0.2	0.3	0.0	5.6	6.8	0.2	0.1	0.0	4.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	505	959	618	323	557	574	1096	683	378	322

Table 2. Codification of the states on the roads to reproduction

Code	Label	Experienced events
H	At home	None
LH	Left home	LH
CH	Child at home	FB
C	Child out home	LH and FB
MH	Married at home	FM
M	Married	LH and FM
MCH	Married w/child at home	FM and FB
MC	Married w/child	LH, FM and FB

Figure 1. Sequences of transversal distributions, by region (both sexes)

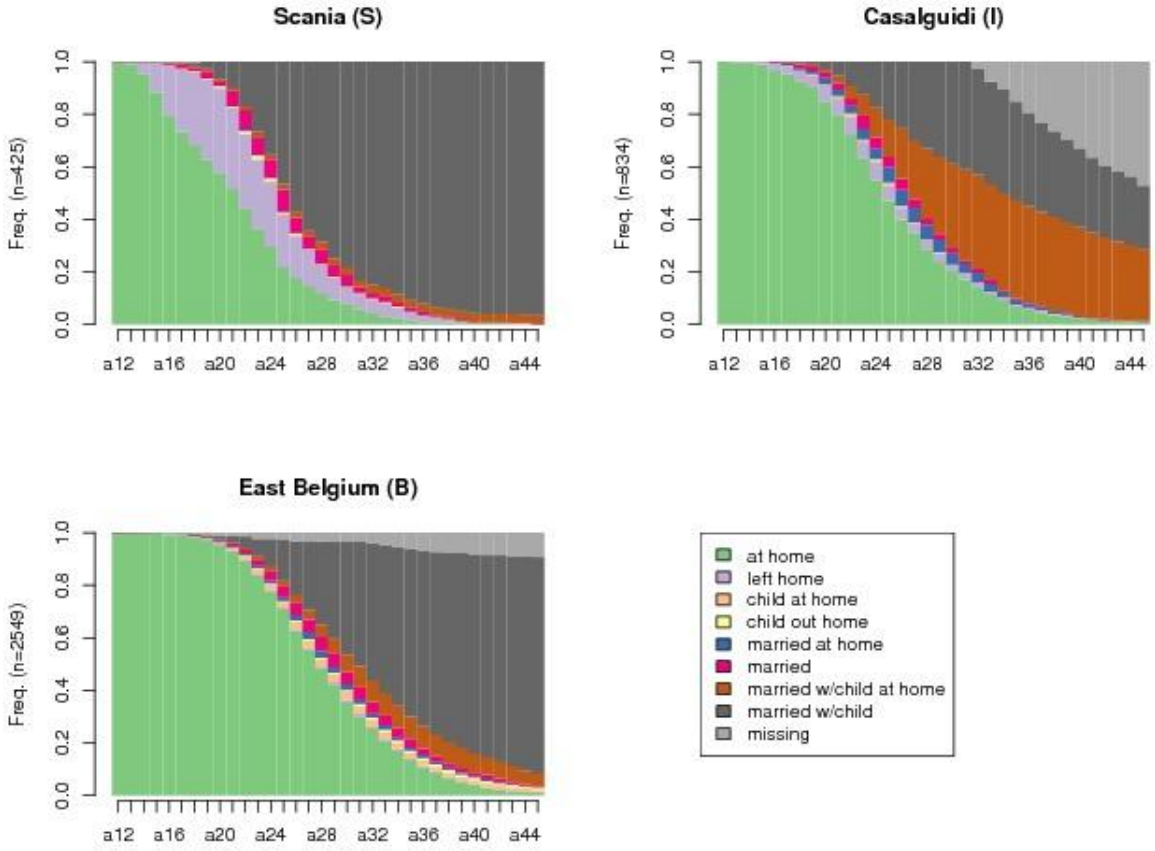

Figure 2. Sequences of transversal distributions, by sexes, in East Belgium

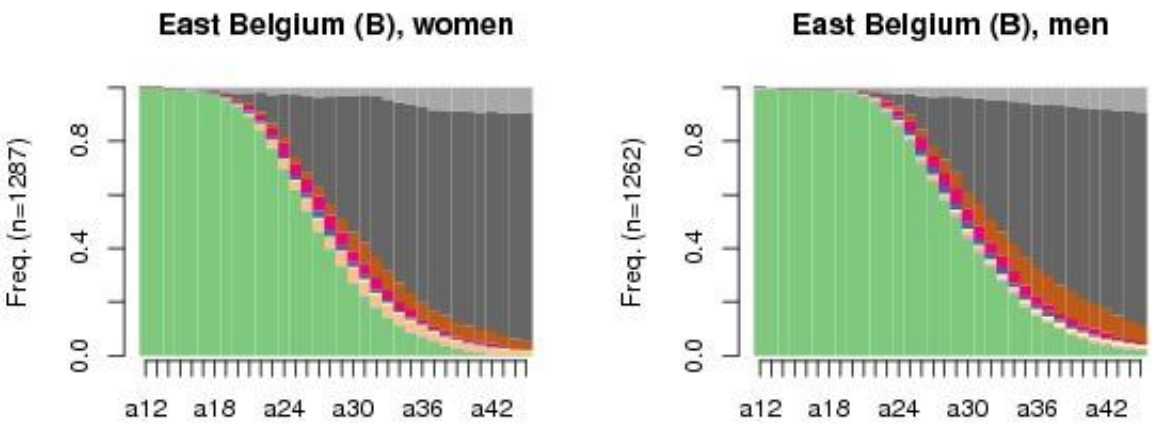

Figure 3. Clusters of living arrangements sequences. Males, East Belgium

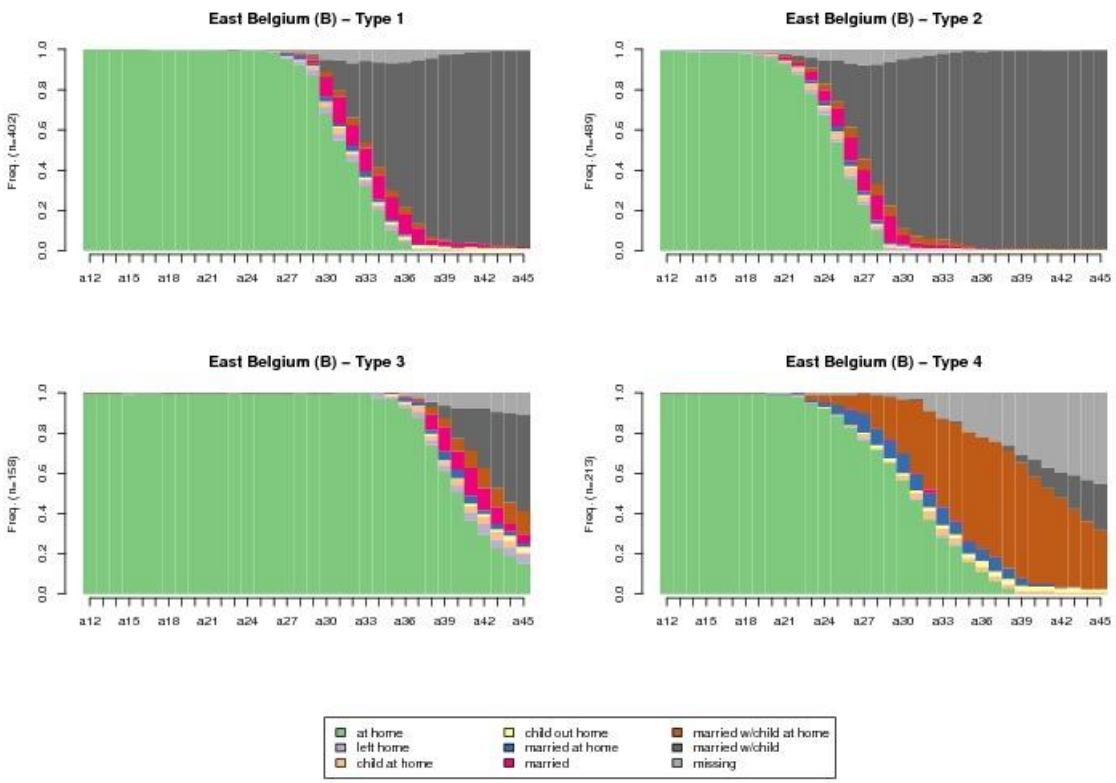

Figure 4. Clusters of living arrangements sequences. Females, East Belgium

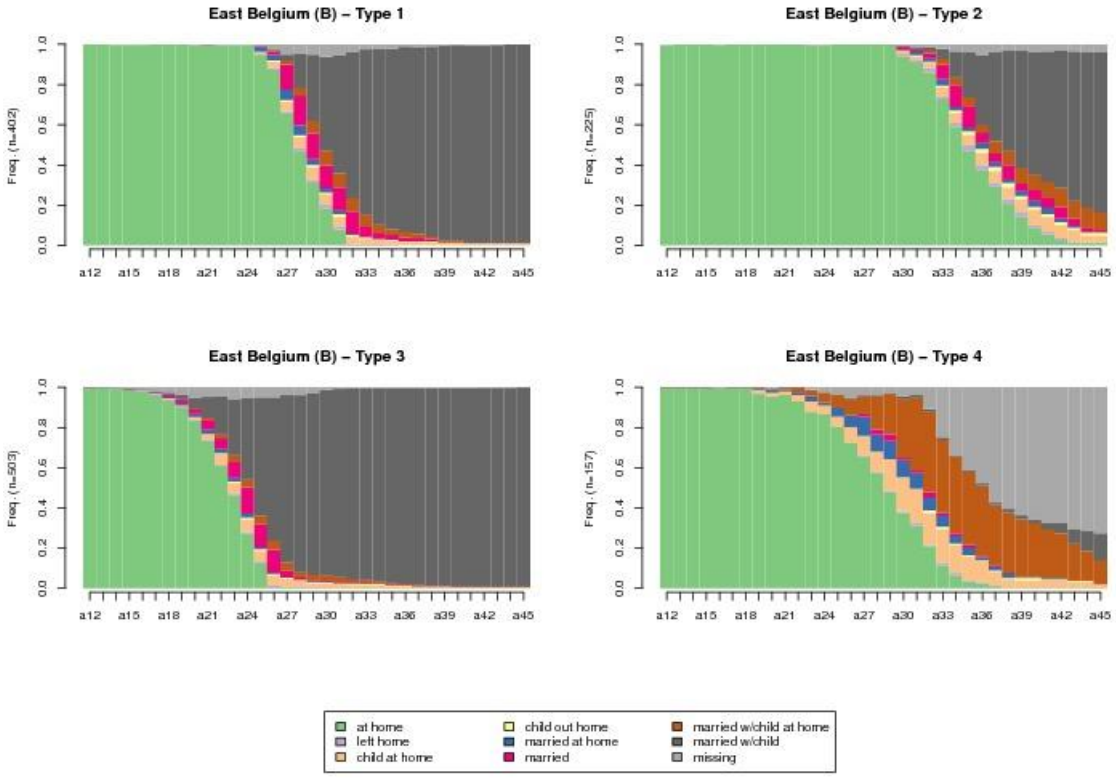

Figure 5. Sequence regression trees for East Belgium

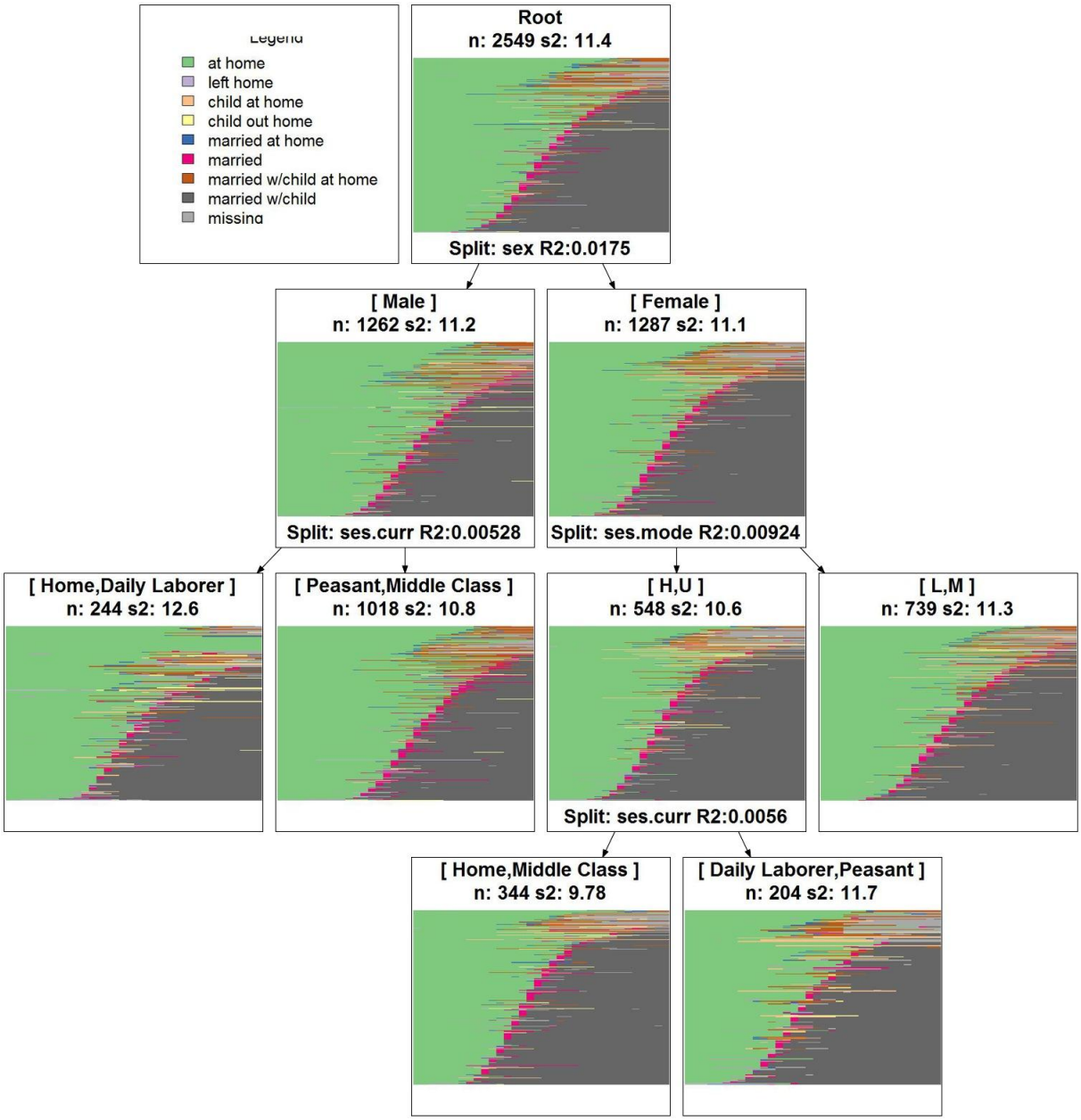

Figure 6. Sequences of transversal distributions, by sexes, in Scania

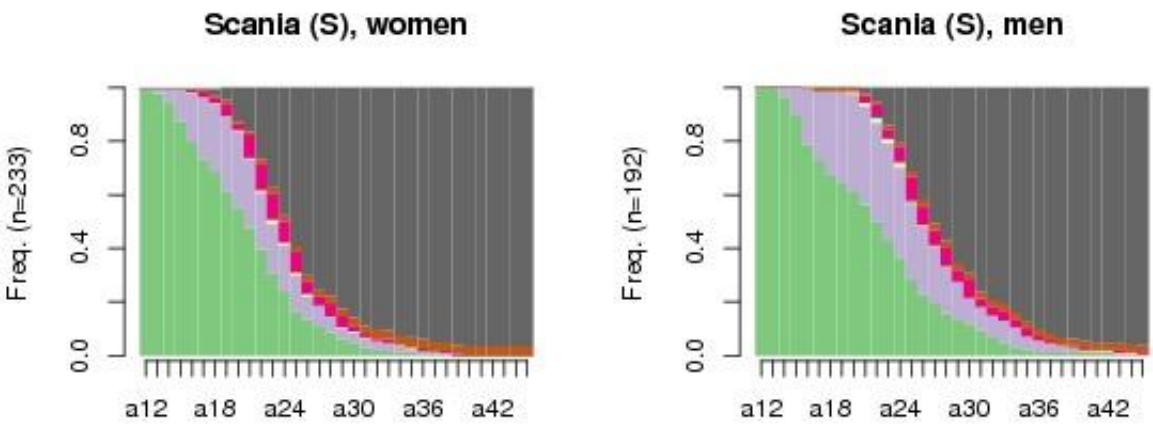

Figure 7. Clusters of living arrangements sequences. Males, Scania

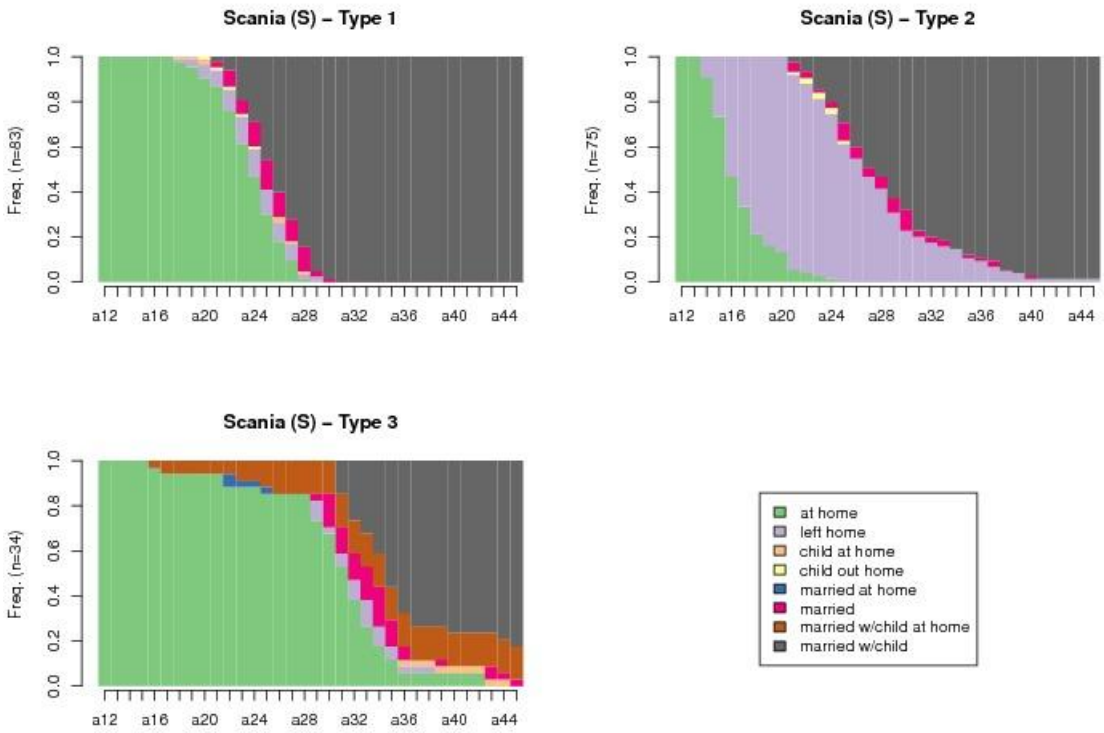

Figure 8. Clusters of living arrangements sequences. Females, Scania

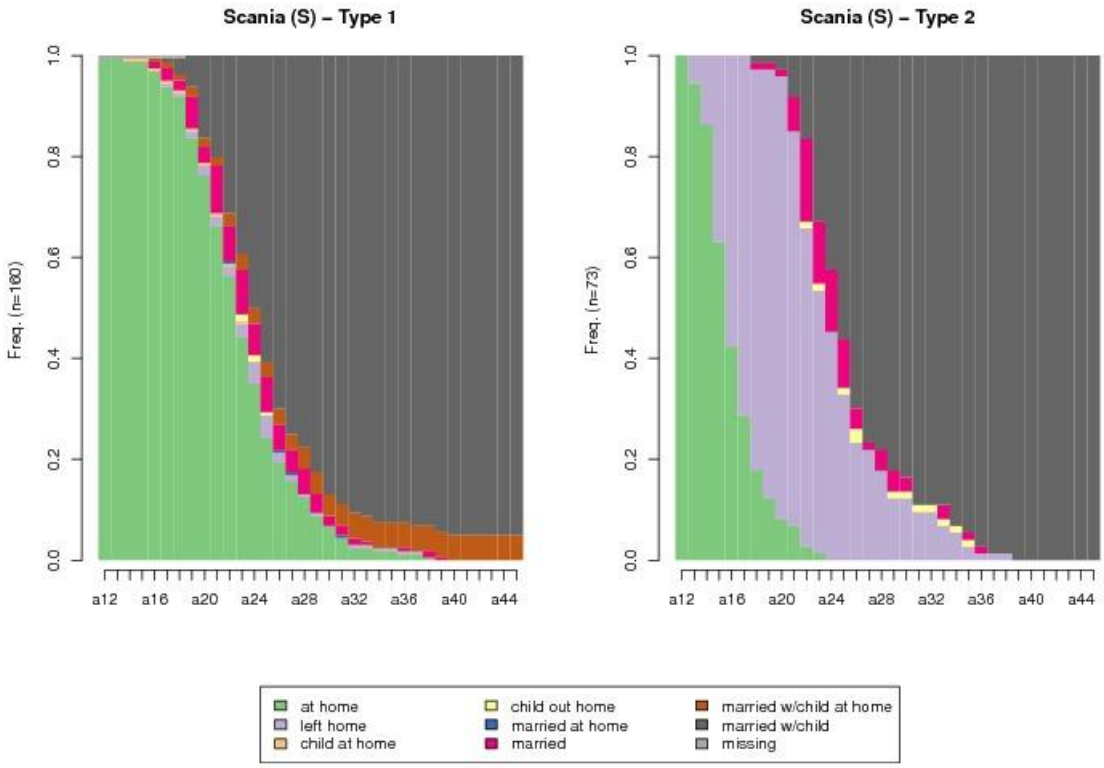

Figure 9. Sequence regression trees for Scania

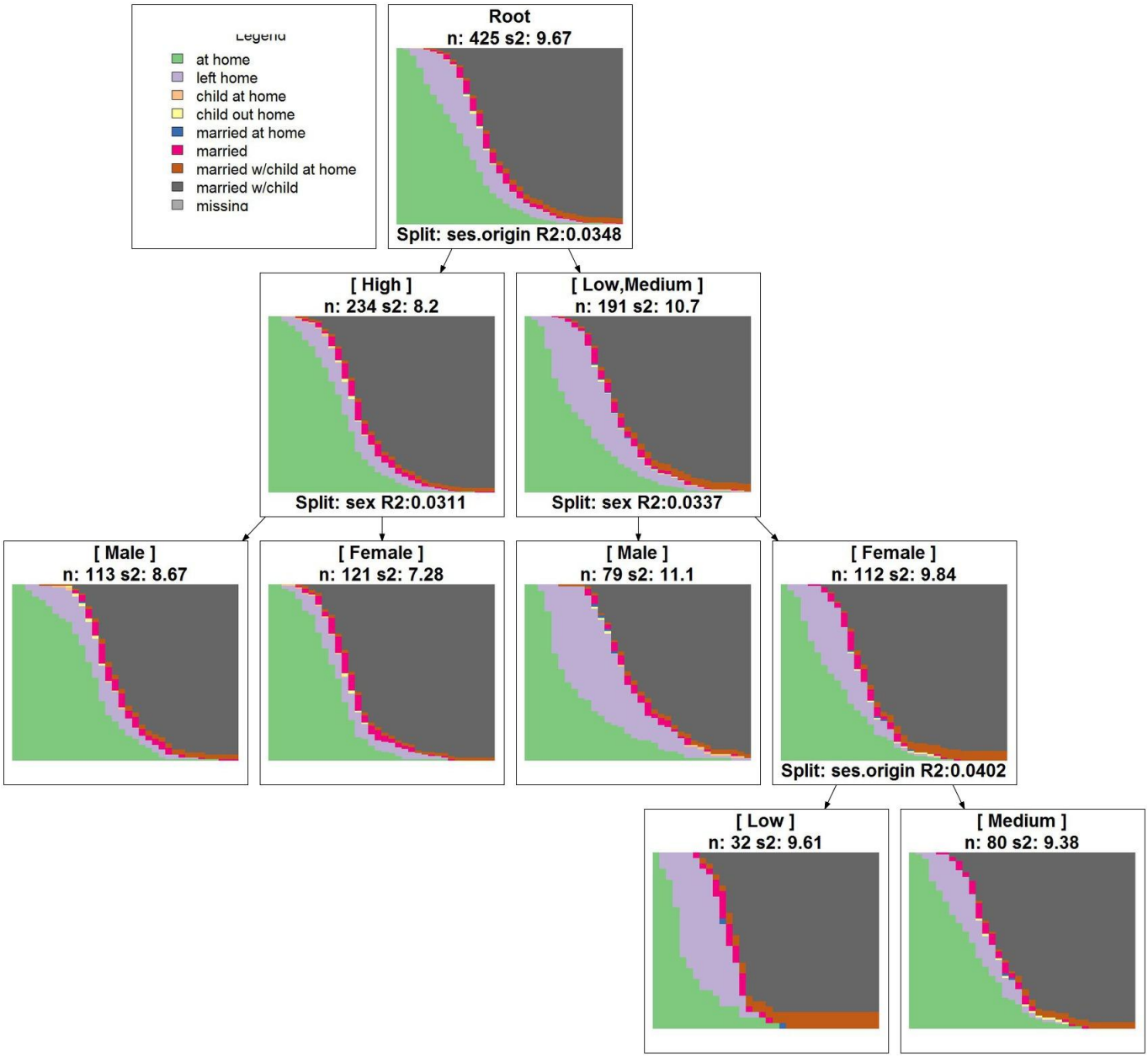

Figure 10. Sequences of transversal distributions, by sexes, in Casalguidi

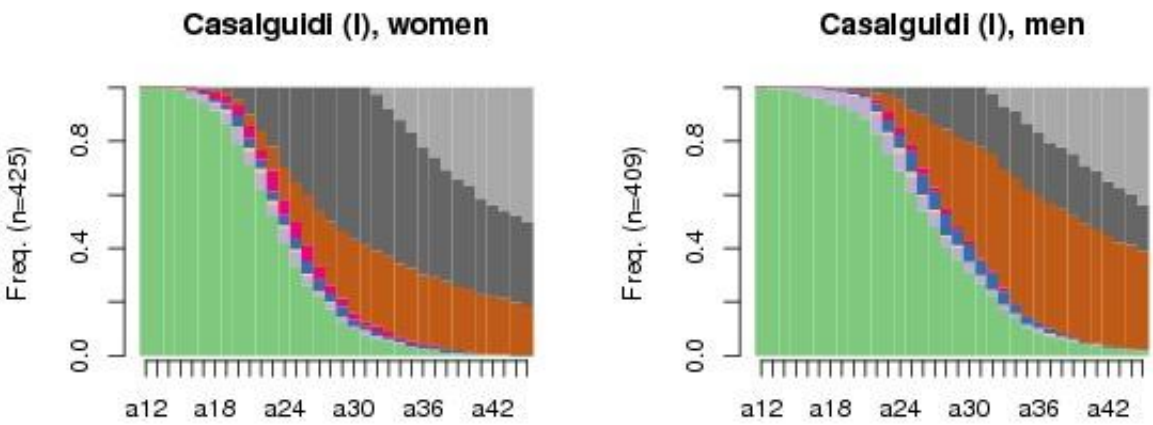

Figure 11. Clusters of living arrangements sequences. Males, Casalguidi

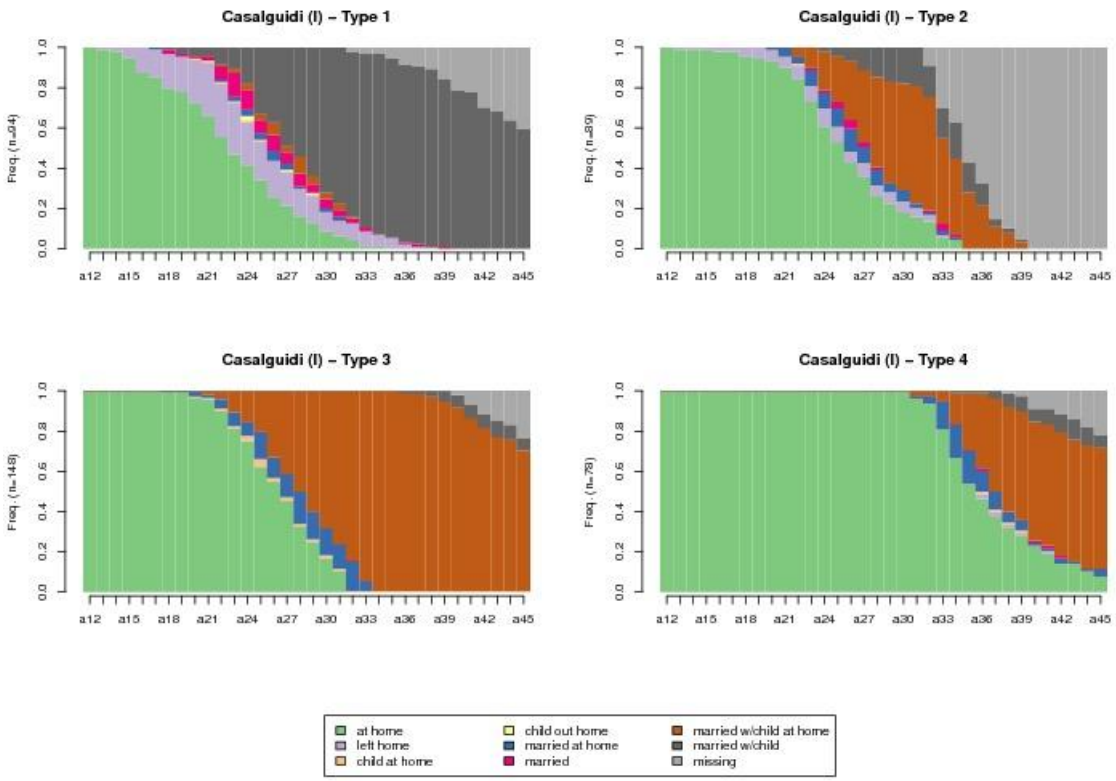

Figure 12. Clusters of living arrangements sequences. Females, Casalguidi

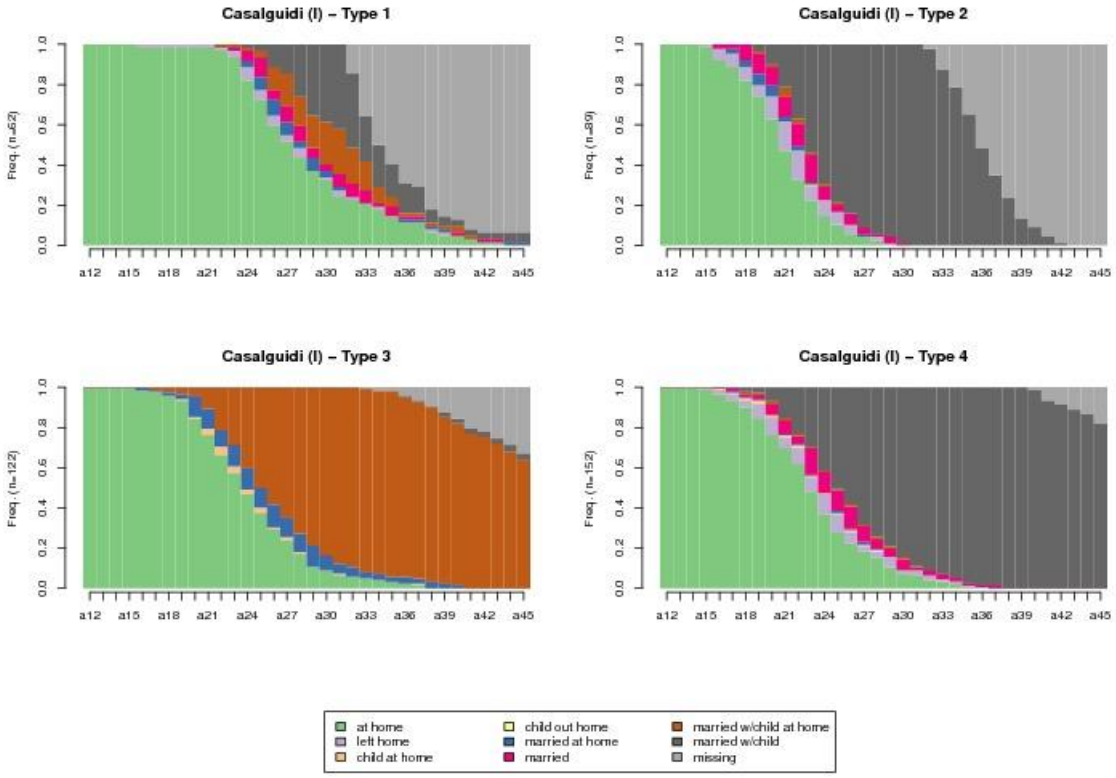

Figure 13. Sequence regression trees for Casalguidi