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Research Article

The changing pattern of cohabitation: A sequence analysis approach

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The changing pattern of cohabitation: A sequence analysis approach

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Abstract

BACKGROUND
During the last decades, nonmarital cohabitation has diffused throughout the industrialised world, although not uniformly. The Second Demographic Transition (SDT) predicts a convergence of cohabitation patterns towards a final stage in which cohabitation and marriage will be almost indistinguishable.

OBJECTIVE
This paper contributes to the literature on the convergence of cohabitation patterns across countries by testing whether countries are becoming more similar over time, as suggested by the SDT.

METHODS
We use sequence analysis and cluster analysis techniques to classify different patterns of cohabitation in France, Italy, Norway, Bulgaria, and the United States. Using data mainly stemming from the Gender and Generations Surveys (GGS), we analyse women's patterns of behaviour during the five years following the start of their first cohabitation, over a time span of three decades (1970s–2000s).

RESULTS
On the basis of sequencing the events of childbirth, marriage, and separation we are able to identify five different clusters corresponding to different ways of going through the cohabitation experience.

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CONCLUSIONS
Our results suggest that there is a general decreasing trend of cohabitation as a pre-marital experience and an increasing trend of cohabitation as an alternative to marriage or as a free union. However, within this homogeneous trend, persistent peculiarities at the country level suggest that the selected countries are not simply at different stages of the same trajectory.

CONTRIBUTION
The classification that emerges from the data-driven approach combines several features of already existing typologies of cohabitation experience. Analysis of the data highlights country peculiarities in the development of the cohabitation experience, rather than the existence of a common path as predicted by the SDT.

1. Introduction

That the prevalence of nonmarital cohabitation has increased during the last thirty years is one of the most striking aspects of wider social changes that have taken place throughout the industrialised world. According to Prinz (1995), the spread of consensual unions is the main indicator of the global social change named "partnership transition", i.e., a transition from relationships based on traditional gender roles to relationships based on equal rights and more egalitarian positions of the two partners. Moreover, the diffusion of cohabitation is an essential component of the Second Demographic Transition theory (SDT) (Lesthaeghe 1995). Within this framework, the pluralisation of family life, driven by a shift in values and attitudes during the last decades, has spread from Northern Europe to the rest of the developed world (Lesthaeghe 2010; Lesthaeghe and Neidert 2006). In the long run, the SDT posits a convergence of cohabitation patterns towards a final stage in which cohabitation and marriage will be almost indistinguishable (Kiernan 2001). Nevertheless, cohabitation has not spread uniformly across European and North American countries (Heuveline and Timberlake 2004; Kiernan 2001; Perelli-Harris et al. 2012; Prinz 1995; Sobotka and Toulemon 2008), which suggests that the heterogeneity observed at the country level is not only the effect of being at different stages of the SDT: Rather, persistent cultural differences, peculiar welfare policies, and the institutional setting may prevent convergence across countries.

In most Northern and Western European and North American countries, cohabitation started to spread in the 1970s and 1980s. During this diffusion process it gradually went from being a deviant phenomenon to become a widespread and accepted behaviour for young people who wanted to start living together. By contrast, Southern

European countries have not experienced the same diffusion of cohabitation and the percentages of cohabiting couples remain among the lowest in Europe. On the other hand, most Eastern European countries experienced a very sharp increase in the proportion of cohabiting couples (and nonmarital births), but only after 1990 (Potârcă, Mills, and Lesnard 2013).

In addition to the prevalence of cohabitation, both the patterns and the connotations of cohabitation vary by country (Hiekel and Castro-Martín 2014; Klüsener et al. 2013; Perelli-Harris 2014; Potârcă, Mills, and Lesnard 2013) and evolve over time. Even within a country, people may attribute different meanings to cohabitation (Hiekel, Liefbroer, and Poortman 2014; Manting 1996; Perelli-Harris and Bernardi 2015; Perelli-Harris et al. 2014).

This paper aims to contribute to the literature on the convergence of cohabitation patterns across countries. Our goal is to test whether countries are becoming more similar over time, as suggested by the Second Demographic Transition, or whether differences persist. In order to do so we need to condense the great diversity of cohabitation characteristics in industrialised countries into a suitable schema. Several authors have already undertaken this task (for a review see Hiekel 2014; Heuveline and Timberlake 2004; Sobotka and Toulemon 2008), mainly by fitting predefined categories to the data, stimulating empirical research, and using a comparative strategy ('typology approach'). In this work we adopt a data-driven approach, accounting for the complexity of trajectories without using an a priori classification. Our research strategy is to implement sequence analysis (Abbott 1995) and cluster analysis techniques in order to arrive at a taxonomy, considering the timing and sequencing of the main events (childbirth, marriage, separation) that can happen in the life course trajectory of a nonmarital union. We then use the resulting clusters to evaluate pattern variation over time and across countries.

We consider five countries, representing different contexts and different diffusion patterns of nonmarital cohabitation: France, Italy, Norway, Bulgaria, and the United States. Using retrospective data, we analyse behaviour over more than three decades (1970s–2000s) and study the level of cohabitation diffusion achieved in the different selected countries.

The paper is organised as follows. In Sections 2 and 3 we present the theoretical background and the research hypotheses of the paper. Section 4 is devoted to a description of data and methods used. The results of the sequence and cluster analyses are described in Section 5 and then used to analyse the convergence of countries. A general discussion of the findings concludes the paper in Section 6.

2. Background and research hypotheses

Before the 1970s the experience of a nonmarital cohabitation was largely limited to couples who, for different reasons, did not have access to marriage (Kiernan 2004; Trost 1978). Since the beginning of the 1970s, the popularity of cohabitation has increased in several contexts together with other changes in cultural elements, such as rising individualism and secularism, and in economic aspects, such as changes resulting from industrialisation, changes in gender roles, and rising female labour-market participation (for a review, see Cherlin 2010; Kasearu and Kutsar 2011; Seltzer 2000, 2004; Smock 2000). At the same time, the sexual revolution contributed to removing the stigma surrounding premarital sex (Bumpass 1990) and promoted the use of modern and highly effective contraceptive methods that, may, in turn, have fuelled the diffusion of cohabitation (Sweeney, Castro-Martín, and Mills 2015).

The spread of cohabitation has been integrated into the framework of the Second Demographic Transition (Lesthaeghe 1995, 2010; Van de Kaa 1987). The SDT posits that cultural shifts and changes in the economic structure trigger individualisation in demographic behaviour, implying an eventual diffusion of informal cohabitation as an alternative to marriage in all industrialised countries. Differences in the timing of the onset of the SDT and in the speed of its diffusion are expected to be the primary cause of observed differences across countries in the patterns of family formation and the percentage of people cohabiting. Indeed, all populations will, sooner or later, experience the cumulative consequences of the processes of secularisation, individualisation, weakening dependence on the family of origin, and increasing emphasis on self-realisation (Lesthaeghe 2010; Lesthaeghe and Neidert 2006), implying a diffusion of cohabitation also. Specifically, the new demographic behaviours should spread from Northern Europe to the rest of the developed world, and countries in Southern and Eastern Europe will also undergo the SDT but with a certain delay, lagging behind Northern and Western European countries and the United States. According to this theoretical framework, countries are at different stages of the transition, and a convergence across countries in the level of unmarried cohabitation and relative patterns of cohabitation can be expected in the long run, with increasing similarity between cohabiting and married couples (McGinnis 2003; Manning and Smock 2005; Rindfuss and VandenHeuvel 1990) and acceptance of nonmarital unions and births (Kasearu and Kutsar 2011; Manting 1996).

It has been claimed that Scandinavian countries are forerunners in the SDT. In Norway, cohabitation experience as the start of a union is ubiquitous, nonmarital cohabitation is hardly distinguishable from marriage, and its social acceptance is nearly universal (Eriksen 2001; Syltevik 2010). Western Europe, France, and the Netherlands in particular, have followed the Scandinavian countries both in terms of diffusion and

legal protection of nonmarital cohabitation (Perelli-Harris and Sànchez Gassen 2012). In the United Kingdom and in Germany, unmarried cohabitation as the first union has become popular among younger age groups, even though cohabitating unions do not have the same legal protection as marital unions. Eastern European countries appear to be at an earlier stage of the SDT, given that in most of these countries cohabitation is still considered atypical, despite its recent growth. Recent studies highlight that the large increase in nonmarital childbearing experienced in some Eastern European countries can have different meanings in different settings (Kasearu and Kutsar 2011; Mynarska and Bernardi 2007; Potârcă, Mills, and Lesnard 2013; Sobotka and Toulemon 2008; Thornton and Philipov 2009). For example, in Romania the diffusion seems to be related more to contraceptive failure in cohabiting couples (Mureşan et al. 2008), but in the Czech Republic to ideational changes (Sobotka, Zeman, and Kantorová 2003). In Bulgaria, nonmarital cohabitation started to increase during the 1960s, i.e., much earlier than previously assumed (Hoem and Kostova 2007), and spread primarily among the lower socioeconomic strata and women with low levels of education (Koytcheva 2006). In the following decades it tended to last progressively longer, suggesting that it has become more than a mere precursor of formal marriage (Hoem and Kostova 2007). In Hungary, cohabitation also started spreading relatively early: In the 1970s it became popular as a union following a divorce, and more recently it started to diffuse as a first union preceding or replacing a marriage (Spéder 2005). In Southern Europe, cohabitation shows a lower level of diffusion than in Western and Northern Europe, and is largely considered a step before marriage rather than a real alternative (Domínguez-Folgueras and Castro-Martín 2013; Gabrielli and Hoem 2010). In Italy there is still a clear prevalence of childbearing inside marriage, although cohabiters and married couples are becoming more similar over time (Castiglioni and Dalla-Zuanna 2014; Di Giulio and Rosina 2007; Gabrielli and Hoem 2010; Pirani and Vignoli 2016). By contrast, in the United States the relatively high level of trajectory de-standardisation leads to early independence and family formation, and to the diffusion of more secularised forms of union formation. The specific patterns observed in the United States, with a relatively high incidence of union disruption, single motherhood, and short-term relationships, suggest that this country is following a distinct and peculiar path (Heuveline and Timberlake 2004; Kiernan 2006; Seltzer 2004; Cherlin 2004, 2009; Sironi, Barban, and Impicciatore 2015). Several authors underline that in the United States the decision to cohabit is actually more an alternative to being single rather than an alternative to marriage, although being single does not preclude childbearing (Heuveline and Timberlake 2004; Rindfuss and VandenHeuvel 1990). Moreover, the United States is characterized by a greater racial and ethnic diversity in family patterns than European countries, with, for example, black women having a higher propensity to cohabit than white women, reflecting differences in both

marriage opportunities and the meaning of marriage for the different ethnic groups (Seltzer 2004).

Despite cohabitation widely sharing some features across countries, such as increasing diffusion among young adults, lower propensity to convert cohabitation into marriage, and increase of childbearing among cohabiters (Sobotka and Toulemon 2008), the examples above also suggest the persistence of differences between countries. In particular, the heterogeneity in the pace and magnitude of changes calls for a rethinking of the idea of unidirectional development posited by the SDT.

Enduring dissimilarities in family formation patterns across Western countries may indeed be the result of different cultural models that imply a different degree of acceptance of unmarried cohabitation (Hiekel and Castro-Martín 2014; Perelli-Harris et al. 2014). These cultural models may be the result of long-term cultural traits (Reher 1998), transmitted from parents to their children (Impicciatore 2015; Liefbroer and Elzinga 2012). Where kinship ties are more important, as in the case of Mediterranean countries, parents may have a stronger impact on children's decisions (Dalla-Zuanna 2001; Micheli 2000; Reher 1998). Choices that openly clash with parental values, such as nonmarital cohabitation and births to unmarried women, tend to be discouraged (Rosina and Fraboni 2004; Di Giulio and Rosina 2007). Where kinship ties are weaker, as in Northern Europe and the United States, the influence exerted by parents tends to be less stringent, with a stronger emphasis on individualism (Cherlin 2009), resulting in a more rapid transition to independence and a larger diffusion of secularised behaviours. According to other authors, differences may persist because of different welfare regimes, institutional settings, and opportunity structures (e.g., youth unemployment, low salaries, expensive housing markets) that favour or hinder the decision to cohabit and the propensity to transform cohabitation into marriage (Buchmann 1989; Esping-Andersen 1990; Ekert-Jaffe and Solaz 2001; Gauthier 2002; Naldini 2003; Tobío 2001; Vogel 2002). Public policies may support some types of family structure over others and provide incentives or disincentives to cohabit, marry, and have children in or outside marriage (Gauthier 2007). Western European countries differ widely in their regulation of cohabitation, and this may give a different social meaning to marriage and cohabitation (Perelli-Harris and Sánchez Gassen 2012). Public policies interact strongly with the level of economic uncertainty, the deregulation of labour markets, and the globalization process. These factors have changed and constrained the economic conditions of young adults in Europe (Blossfeld et al. 2005; McDonald 2006) and thus affect union formation practices by increasing the perceived risk of early family commitments (Perelli-Harris and Gerber 2011; Vignoli, Tocchioni, and Salvini 2016). Marriage is costly, and for those in precarious and low paid employment cohabitation might be preferred (Kalmijn 2011). The increase in extra-marital cohabitation and childbearing in Europe and in the United States therefore has

been interpreted as a "pattern of disadvantage" (Perelli-Harris et al. 2010), as it involves mainly less-educated and deprived groups. Based on the long-term cultural traits, institutional changes, economic conditions, public policies, or legislation at play, we can expect that each country will follow a specific evolution and that differences in the pattern of nonmarital unions will persist over time.

In this work we adopt a descriptive approach in order to investigate whether the differences in cohabitation patterns across countries are because countries are at different stages of the SDT (and so will eventually converge) or because cohabitation patterns remain distinct between countries over time. In more detail, we want to test the following hypotheses predicted by the SDT theory:

> *Hypothesis 1*: Cohabitation is increasingly becoming an alternative to marriage in Europe and North America, i.e., cohabitation and marriage are becoming indistinguishable.
>
> *Hypothesis 2*: Cohabitation patterns become more similar over time across countries, and Southern and Eastern European countries are converging towards Northern European and North American countries.

In order to test these two hypotheses, we first have to grasp the heterogeneity in cohabitation patterns by identifying typologies or, better, a taxonomy of trajectories (see Section 3). The underlying diffusion process considers an initial stage where cohabitation emerges as a deviant phenomenon, practiced by a selected group of the population (not necessarily the intellectual elites; see, for example, Bernhardt and Hoem 1985; Blom 1994; Vitali, Aassve, and Lappegård 2015), and then evolves into a more accepted behaviour spreading over other social groups, who are usually less selected and more dependent on approval by their social environment (Guetto et al. 2016). The final stage may be that any distinction between marriage and cohabitation becomes meaningless because the two living arrangements increasingly converge in terms of lifestyle, childbearing, and equality between partners (Prinz 1995). Therefore, after identifying a different cohabitation taxonomy, we look at how prevalent each pattern is in each country and whether it changes over time. In this way we can test whether there is convergence across countries, and whether countries are shifting towards cohabitation as an alternative to marriage.

3. Searching for a cohabitation taxonomy

The starting point of our research strategy is the classification of cohabitation patterns. In the literature, several attempts have been made to grasp the heterogeneity of the cohabiting population, and the proposed schemas share common traits (Sobotka and Toulemon 2008). Villeneuve-Gokalp (1991) is one of the first authors to classify cohabitation in the European context. Her strategy focuses on marriage, birth of a child, and separation that happen in the first three years of cohabitation. She distinguishes four different types of cohabitation: cohabitation as a temporary situation preceding marriage (either as a 'prelude to marriage' or as a 'trial marriage' allowing for a period of testing); cohabitation without strong commitment leading to a 'temporary union' with separation after a short period of time; cohabitation as a 'stable union without commitment', a long-lasting coresidence without children or marriage; and cohabitation as a 'free union' in which couples behave as if they are married, having children but without caring about marrying.

For the United States, Heuveline and Timberlake (2004) point to the presence of children as a key factor in defining the meaning and commitment of a union. Their broad comparative perspective integrates the social acceptability of cohabitation and provides six ideal types: (a) 'marginal', if society discourages cohabitation; (b) 'prelude to marriage', if it involves a marriage in a short time but not a birth before marriage; (c) 'stage in marriage process', if children tend to be born during the cohabitation but this is soon transformed into a marriage; (d) 'alternative to single', if the cohabiting partners want to postpone forming a family and prefer cohabiting rather than living separately during courtship; (e) 'alternative to marriage', if children are born in the nonmarital union but the cohabitation usually is not transformed into a marriage; (f) 'indistinguishable from marriage', if there is little social distinction between cohabitation and marriage because of the general acceptability of unmarried cohabitations (for example, if institutional support for parents essentially ignores marital status). In the context of the United States, Bianchi and Casper (2000) and Willoughby, Carroll, and Busby (2012) suggest similar classifications based on cohabiters' plans to marry and their engagement status. Hiekel, Liefbroer, and Poortman (2014) develop a typology of different meanings of cohabitation based on marriage attitudes, future intentions, and feelings of economic deprivation, resulting in six types: 'prelude to marriage', 'trial marriage', 'cohabiters for economic reasons', 'intend to marry', 'refusal of marriage', and 'marriage is irrelevant'.

Most authors do not approach the question of the convergence to a common pattern of family formation across countries from an empirical point of view. However, many of them explicitly recognise the great diversity among cohabiting unions in

Europe and North America, and their persistently different roles in the childbearing process (Perelli-Harris and Bernardi 2015).

Unlike previous research, we use sequence analysis and cluster analysis to classify different patterns of events following the start of a (first) informal union. The result is an empirically based analysis that does not depend on categories previously chosen by the researcher. The existing literature assists us in the interpretation of patterns, keeping in mind that the resulting clusters of trajectories may overlap with the categories proposed in the literature, but may also highlight specific features that might have been overlooked by previous classifications. In other words, by following an empirical strategy rather than a conceptual classification, we are looking for a "taxonomy" (Bailey 1994) of patterns.

4. Data and methods

4.1 Data

We focus our analysis on cohabitation patterns in the following countries: France, Italy, Norway, Bulgaria, and the United States. We select these countries based on two criteria: (a) the selected countries should represent different institutional and cultural settings in modern developed societies and display different levels of cohabitation diffusion and different prevalence of nonmarital fertility, and (b) no specific welfare regime or national economic conditions should be over-represented.

We use mainly data from the Gender and Generation Survey (GGS), a comparative set of surveys carried out in several European countries, in the version harmonised by participants in the Nonmarital Childbearing Network[4] (Perelli-Harris, Kreyenfeld, and Kubisch 2011). In the comparative harmonised histories dataset,[5] special attention is devoted to the harmonisation of information regarding the timing of demographic events (leaving the parental home, union formation and dissolution, birth of a child)

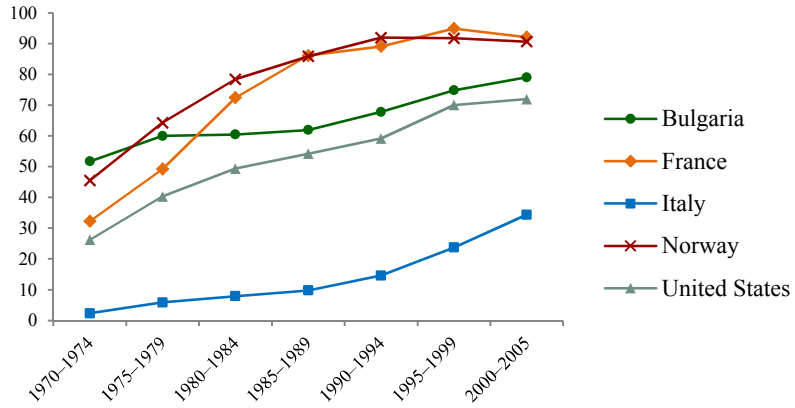
[4] Karolin Kubisch at the Max Planck Institute for Demographic Research, Rostock managed the standardization and cleaning process of the surveys.

[5] The Italian data comes from the Indagine Multiscopo Famiglia e Soggetti Sociali (FSS) conducted by Istat in 2009, which is not part of the GGS programme. The US data is obtained by merging two waves of the National Survey of Family Growth (NSFG) conducted in 1995 and 2006–2008, considering, in each wave, women aged between 25 and 45 years at interview. For the other countries we used the first wave of the GGS. However, we take advantage of the information provided in the second wave of the GGS surveys to address the fact that some of the most recent observations in France and Bulgaria are censored and that these two countries have older interview data than the other countries (2005 and 2004, respectively). For the observations that are censored in the first wave and that do not suffer from attrition in the second wave, we are able to input the dates of the events of interest from the second interview (213 Bulgarian women out of 307 who had censored information in the first wave, and 309 French women out of 447).

with the selection of other information regarding family background, socioeconomic status, values, and opinions.

The focus is on first informal unions. In this way we select a homogeneous group of cohabitants whose union and family choices depend mainly on the acceptability of cohabitation in a certain setting. Moreover, the proportion of women who start their first union by cohabiting instead of marrying increases in all countries over time (Figure 1), whereas the prevalence of cohabitation following a separation did not show a similar dynamic trend.[6] Therefore, we exclude from the analysis those cohabitations following a separation or a divorce, given that they are influenced by the level of divorce in a specific country and have less relevance for the study of the social acceptability of cohabitation. For each country we select women whose experience of a first coresidential union was a nonmarital cohabitation. We select women born between 1950 and 1984 who started their first cohabitation during the period 1970–2005, i.e., a range of observations that is available for all countries.[7] The analysis is restricted to women because not all the surveys include complete male union histories. We also exclude from the analysis women with a child at the beginning of the first union.

Figure 1: Proportion of women whose first union was a nonmarital cohabitation, selected countries, 1970–2005



Source: GGS (Bulgaria, France, Norway), FSS (Italy) and NSFG (USA).

[6] In the selected countries the proportion of women starting a second union as a cohabitation after the first marriage is dissolved remains constantly under 30%, with a slight increase from the 1970s onwards. Only Italy presents higher values, but with a very low number of second unions.

[7] In this paper we focus on unions formed in the years 1975–2005, in a period perspective. In this way we can analyse the most recent experiences of women entering a cohabitation. The alternative analysis following a cohort perspective provided similar results (data not shown).

We analyse the sequence of events happening monthly in the first five years (60 months) after the start of the informal union.[8] The decision to focus on the first five years is driven by the fact that cohabiting unions tend to be short-lived, as they either convert into marriages or break up. Only few continue for extended periods of time (Kiernan 2004; Murphy 2000). First unmarried cohabitations last for no longer than three years for the majority of women (from 50% in Norway and Italy to 76% in the United States), and no longer than five years for two out of three women (from 67% in Norway to 88% in the United States). In particular, we focus on the following events: the transformation of a nonmarital union into a marriage (if any), the birth of the first child (if any), and the separation from the first partner (if any).

4.2 Methods

We use a sequence analysis approach, originally proposed by Abbott (1995) (for a review, see Abbott and Tsay (2000) and Billari (2001)). This method can be employed to describe the quantum (what and how many transitions happened) and the timing (at what age different life transitions happened) of interrelated events together with their sequencing (in what order the transitions happened). This allows researchers to describe different patterns of life course trajectories taking into account several events simultaneously, and then to identify a cohabitation taxonomy. By focusing on the analysis of entire trajectories rather than the occurrence of single events, sequence analysis overcomes the limitations of event history analysis and takes into account the interrelation between multiple events (Barban and Sironi 2018). Specifically, by clustering trajectories we can reduce the complexity[9] while at the same time preserving information about the duration of stay within each state.

After representing a life course trajectory (or part of it) as a sequence of characters indicating the status in a specific unit of time (month, in our case), a matrix of dissimilarities between pairs of sequences is computed. One sequence can differ from another in terms of quantum, timing, and sequencing. However, a sequence may be shorter in the case of right censoring, i.e., if the interview occurs before the 60th month

[8] Focusing on the first five years of cohabitation allows us to both highlight the patterns of cohabitation and avoid comparing sequences with a very different length. However, in order to test the robustness of our results, we also developed our analyses using sequences up to 8 years (96 months), obtaining robust results (data not shown).

[9] Even though we basically consider only three events (marriage, first birth, and separation between cohabitors), the resulting state space identifies seven possible transitions between states. As opposed to event history analysis, sequence analysis permits considering all these transitions simultaneously. Nevertheless, the relative simplicity of the state space justifies the use of a simple sequence analysis over more sophisticated alternatives like multichannel sequence analysis (Gauthier et al. 2010; Pollock 2007), which require a more complex state space to correctly analyse separate careers.

after the start of cohabitation. We consider six possible states: unmarried cohabiting with no children (Cohabiting), unmarried cohabiting parent (Cohabiting Parent), separated without children (Separated), separated with children (Separated Parent), married without children (Married), and married with children (Married Parent).

The dissimilarity measure between pairs of sequences is based on the length of common subsequences between life course trajectories (or the LCS metric proposed by Elzinga 2006) that can be used with sequences of different lengths. The matrix of dissimilarities is computed with Rpackage TraMineR (Gabadinho et al. 2011), considering pooled data for all countries. Similar sequences are subsequently grouped in a limited number of patterns through a hierarchical cluster analysis using the Ward linkage (Aassve, Billari, and Piccarreta 2007). A hierarchical tree diagram illustrating the clustering process – also known as a dendrogram – suggests the number of clusters. Through cluster analysis the complexity is partially reduced while maintaining differences between clusters in timing, tempo, and ordering of events.

Additionally, we compute the Shannon entropy of the observed state distribution and the measure of turbulence [10] (Elzinga 2003; Elzinga and Liefbroer 2007) by year of union for the pooled sample and separately by country. In this way we can evaluate the evolution of the heterogeneity of patterns across time and space. After we define the clusters, our first step is to implement multinomial logistic regression models using the developed taxonomy as a dependent variable and estimate the probability of experiencing a specific pattern of cohabitation. To that end we construct a random indicator variable Y_{ij}, which we index $1, 2, \dots, J$, and which takes the value of 1 when individual i's cluster falls into the j-th cluster, and 0 otherwise. The multinomial logits are estimated in $J - 1 = 4$ equations as follows:

$$log\left(\frac{\Pr\{Y_{ij}=\mathrm{j}|X_i\}}{\Pr\{Y_{ij}=1|X_i\}}\right) = X_i\beta_j,$$

where X_i is a vector of covariates associated with the i-th individual, and β_j is a vector of regression coefficients for $j = 1, 2, \dots, J - 1$.

The vector X_i includes the country of birth, the year of union (1970–1974, 1975–1979, 1980–1984, 1985–1989, 1990–1994, 1995–1999, 2000–2005), and the interaction between the two. In this way we can study the probability of belonging to different cohabitation patterns over time and across countries and test our research hypotheses

[10] Entropy can be interpreted as the uncertainty of state prediction in a given sequence. Entropy is 0 if all states in the sequence are the same and is maximal when each of the states appears in the same proportion over the sequence. Sequence turbulence is based on the number of distinct sub-sequences in combination with the variance of duration of time spent in each distinct state. Thus, turbulence increases with the number of distinct states and with the number of transitions occurring, and decreases with variance of the time spent in the states. Unlike entropy, turbulence is sensitive to state ordering.

(i.e., whether more cohabitations are becoming an alternative to marriage and whether there is convergence across countries).

Previous research underlines the role of age at coresidence in the subsequent progress of the partnership and its marital success (Kuperberg 2014) and the relevance of education and parents' characteristics to family formation patterns (Elzinga and Liefbroer 2007; Furstenberg, Rumbaut, and Settersten 2005; Rijken and Liefbroer 2009; Wiik 2009; Sironi, Barban, and Impicciatore 2015). Therefore, the vector X_i also includes the following control factors: age at first union (–19, 20–24, 25–29, 30–34, 35+), respondent's education at interview (low, medium, high, corresponding to ISCED 0–2, ISCED 3 and ISCED 4 and above) and parents' education (low, medium, high, or ISCED 0–2, ISCED 3 and ISCED 4 and above).

A similar research strategy has been developed by Potârcă, Mills, and Lesnard (2013) for Romania, the Russian Federation, and France, by Fulda (2016) for Germany, by Kleinepier and de Valk (2016) for the Netherlands, by Hart and Lyngstad (2016) for Norway, and by Jalovaara and Fasang (2015) for Finland. However, these studies focus on broader life course trajectories where cohabitation is only one among several choices and where all the different kinds of cohabitation would collapse into one or very few clusters, making it hard to detect heterogeneity within the cohabitation experience. In other words, in a broader perspective that considers a larger number of possible trajectories that do not include cohabitation, the different clusters cannot account for the variability within cohabitation.

In our second step we take into account the level of cohabitation diffusion in a specific year and in a specific country. We follow this strategy because at an equal level of cohabitation diffusion a certain type of pattern should prevail. For instance, when the diffusion of cohabitation is at an early stage, we expect to observe events that are rapidly followed by marriage. In other words: Are the characteristics of cohabitation in the United States in the late 1970s comparable to those in Italy during the late 1990s (assuming that the diffusion of cohabitation was similar in the 1970s' United States and 1990s' Italy)? Therefore, we include in the multinomial logistic models the average level of cohabitation diffusion in a specific country during a specific year (instead of the variables 'country of residence' and 'year of start of the union'). This diffusion variable considers the percentage of first unions out of all unions that are cohabitations, expressed in quartiles (<25%, 25–50%, 50–75%, >75%) in a specific year in a specific country. This new model allows us to explore whether the pattern of cohabitation that we observed in the previous models is confirmed when taking into account cohabitation frequency, i.e., observing different countries as if they were at the same stage in the diffusion process. The control variables included in this model are: age at first union, respondent's education at interview, and parents' education. In all our regression models the standard errors are clustered by country.

This research strategy is similar to that used by Nazio and Blossfeld (2003) in their study of the diffusion of cohabitation among different cohorts, by Liefbroer and Dourleijn (2006) in their analysis of the influence of cohabitation diffusion on the risk of union dissolution, and by Perelli-Harris (2014), who referred to the percentage of first births in cohabitation to study the prevalence of second births.

5. Results: Patterns of cohabitation

5.1 Descriptive findings

The cohabitation experience is strongly heterogeneous across the countries in our sample. Three out of four women born between 1950 and 1984 started their first union as a nonmarital cohabitation in France (75.5%) and Norway (80.4%), 65.5% in Bulgaria, 52.3% in the United States, and only 16.2% in Italy (Table 1). In Bulgaria the prevalence of cohabitation was already very high before 1991 (Di Giulio and Koytcheva 2007), even though it was largely experienced as a premarital episode (93% of cohabitations begun before 1991 eventually moved into marriage). Italy persistently showed lower percentages up to the mid-1990s, when some convergence with the other countries started to emerge, helped by the fact that the diffusion of cohabitation reached a plateau in France and Norway.

Table 1: Description of the selected surveys, women born 1950–1984 who started their first cohabitation during 1975–2005, by country

Country	Year of interview	Women (born 1950–1984)	% of cohabitation (as first union)	Selected subsample (first union started 1970–2005)	Number of events within the first 5 years of cohabitation		
					Marriages	Disruptions	First births
Bulgaria	2004–2007	5,006	65.5	2,534	2,032	153	2,208
France	2005–2008	3,405	75.5	2,096	905	455	1,028
Italy	2009	10,842	16.2	1,186	596	262	580
Norway	2007–2008	4,587	80.4	2,792	988	797	1,397
United States	1995; 2006–2008	16,060	52.3	4,716	2,446	1991	2,511
Total				13,324	6,967	3,658	7,724

Note: Italian data is from the Multiscopo survey conducted by Istat in 2009 (FSS). The harmonised dataset includes France, GGS; Norway, GGS; Bulgaria, GGS; US, National Survey of Family Growth (NSFG).

5.2 Clustering data

In this section we present the main results of the sequence analysis. First, we show the typical patterns that emerged in terms of sequence of states and time spent in each state, identified by the cluster analysis. Second, we evaluate the propensity to follow a specific cohabitation pattern according to cohort and country, taking into account other control factors (level of education, parent's level of education, age at union formation). The descriptive statistics of all variables used in the regression analysis are shown in Table 2. Figure 2 shows the different cohabitation patterns.[11] Each graph is a specific cluster and represents, month by month, the distribution of the respondents according to the different stages of their life (the states used in the sequence analysis).

The first cluster (the most frequent, comprising 30.5% of the pooled sample) represents women in premarital cohabitation leading to fast marriage and childbearing: After three years almost all of them have married and eight out of ten already have a child. We name this cluster 'Prelude to fast marriage and children'. In the second cluster (17.5% of the sample) only a residual quota of cohabitations moves into marriage within five years and the vast majority of women enter motherhood within nonmarital cohabitation, suggesting that couples behave as if they were married. Recalling Heuveline and Timberlake's (2004) classification, we call this cluster 'Alternative to marriage'. The third cluster (18.1% of the sample) comprises mainly disrupted unions without children and thus is called 'Temporary union'. The fourth cluster (representing 12.8% of the sample) comprises women who cohabit and then move on to marriage, but only rarely have a child within the observation window. Given that separation is rare, women in this cluster might consider unmarried cohabitation as a testing ground, which results in a positive evaluation of the relationship. We call this cluster 'Prelude to childless marriage'. Finally, in the fifth cluster we see a prevalence of stable unions with no events, at least in the first 40 months. Moreover, almost 60% of the women in this cluster remain in this state at least until the end of their fifth year of cohabitation. This cluster (21.1% of women) is called 'Stable cohabitation'.

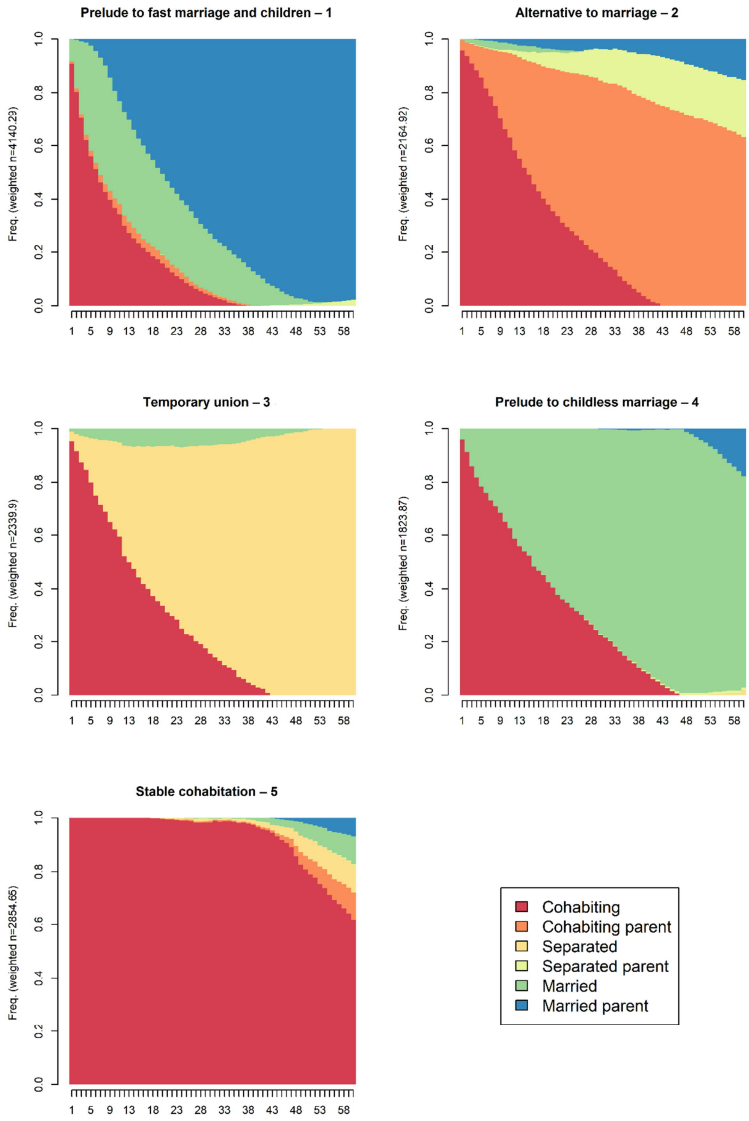
[11] The dendrogram from the cluster analysis (not shown, available on request) suggests that the best solution is to set the number of clusters at 5.

Table 2: Descriptive statistics of pooled sample used in the regression analysis

	N	&	Bulgaria	France	Italy	Norway	USA
Cluster							
Prelude to fast marriage and children	4,066	30.5	67.6	21.7	22.3	20.3	22.6
Alternative to marriage	2,337	17.5	14.8	16.8	17.5	18.6	18.7
Temporary union	2,414	18.1	3.1	14.9	15.1	19.4	27.6
Prelude to childless marriage	1,700	12.8	8.3	12.4	15.6	8.2	17.4
Stable cohabitation	2,807	21.1	6.2	34.3	29.6	33.5	13.7
Year of first union							
1970–1974	639	4.8	5.8	4.4	1.4	4.8	5.3
1975–1979	1,299	9.8	9.4	8.8	5.5	8.7	12.1
1980–1984	2,032	15.3	16.5	13.5	7.9	13.8	18.1
1985–1989	2,403	18.0	18.4	18.4	9.9	18.5	19.5
1990–1994	2,446	18.4	20.4	19.1	14.5	19.7	17.1
1995–1999	2,272	17.1	18.4	18.4	22.5	18.3	13.7
2000–2005	2,233	16.8	11.1	17.5	38.4	16.2	14.4
Level of education							
High	5,697	26.4	41.4	24.4	49.2	53.0	53.0
Medium	5,297	50.79	42.9	44.1	37.6	32.6	32.6
Low	2,330	22.81	15.7	31.5	13.2	14.4	14.4
Parent's level of education							
Low	3,359	25.2	13.6	45.2	66.8	19.7	15.4
Medium	5,950	44.7	68.8	30.7	25.0	52.5	38.2
High	3,570	26.8	12.7	14.7	8.3	26.6	44.5
Missing	445	3.3	4.9	9.4	0.0	1.3	1.9
Age at union formation							
–19	4,996	51.4	29.0	19.1	31.1	42.2	37.5
20–24	5,757	37.9	52.5	33.6	50.0	40.4	43.2
25–29	1,898	8.7	14.4	27.7	14.7	13.5	14.2
30–34	520	1.5	3.1	14.8	3.2	3.3	3.9
35+	153	0.6	1.0	4.8	1.1	0.7	1.2
Total	13,324	100	100	100	100	100	100

Source: GGS (Bulgaria, France, Norway), FSS (Italy), and NSFG (USA).

Figure 2: Distribution of states by duration for each cluster (time in months on the horizontal axis)



Source: GGS (Bulgaria, France, Norway), FSS (Italy), and NSFG (USA).

Table 2 shows the distribution of women belonging to each cluster by country, year of union, respondent's level of education, parents' level of education, and age at union formation. Most informal unions started in the 1980s, except for Italy where the diffusion of cohabitation is more recent. The resulting clusters overlap with several traits in the V–G (Villeneuve-Gokalp 1991) and H–T (Heuveline and Timberlake 2004) classifications while introducing additional relevant features to the theoretical classifications in the literature. Specifically, the resulting clusters fall somewhere in between the two theoretical schemes, borrowing features from both of them. This also means that both V–G and H–T classifications reveal some shortcomings when tested empirically. As far as the H–T typology is concerned, excluding the groups 'marginal' and 'indistinguishable from marriage', which focus on contextual settings more than individual patterns, we notice that the pattern 'stage in the marriage process' (i.e., childbirth in the consensual union and then marriage) does not emerge as a relevant trajectory in the selected countries. On the other hand, the pattern with a stable cohabitation with no marriage or childbirth, the second most common in our data, is not explicitly considered. Regarding the V–G scheme, the cluster analysis does not distinguish between trajectories with an early marriage (i.e., within the first year of cohabitation, called 'prelude to marriage') and those with a marriage occurring later (called 'trial marriage'). Moreover, our results suggest the need for a greater emphasis on the role of children in the different patterns, as proposed by Heuveline and Timberlake in their schema.

5.3 Multivariate analysis

The variables in Table 2 are those used in the multinomial logistic regressions. Key results of the multivariate models are shown in Figure 3, where the predicted probability of being in each cluster is plotted by country and starting year of the union together with the confidence interval (at the 95% level).

The probability of belonging to Cluster 1 (Prelude to fast marriage and children) decreases steadily over time, especially during the 1970s and 1980s, for all countries but Bulgaria, where the probability remains higher till the 1990s but decreases steadily thereafter, showing a convergence trend towards the other countries. Conversely, cohabitation as an 'Alternative to marriage' (Cluster 2) increases over time for the United States, France, Norway, and Bulgaria, whereas it is roughly constant for Italy. However, in France and Norway we see a reversal of this trend among unions started in the period 2000–2005. In France this pattern is linked to a strong increase in the probability of belonging to Cluster 3 (Temporary unions), whereas in Norway it is related to an increase in both 'Temporary unions' and 'Stable cohabitations'.

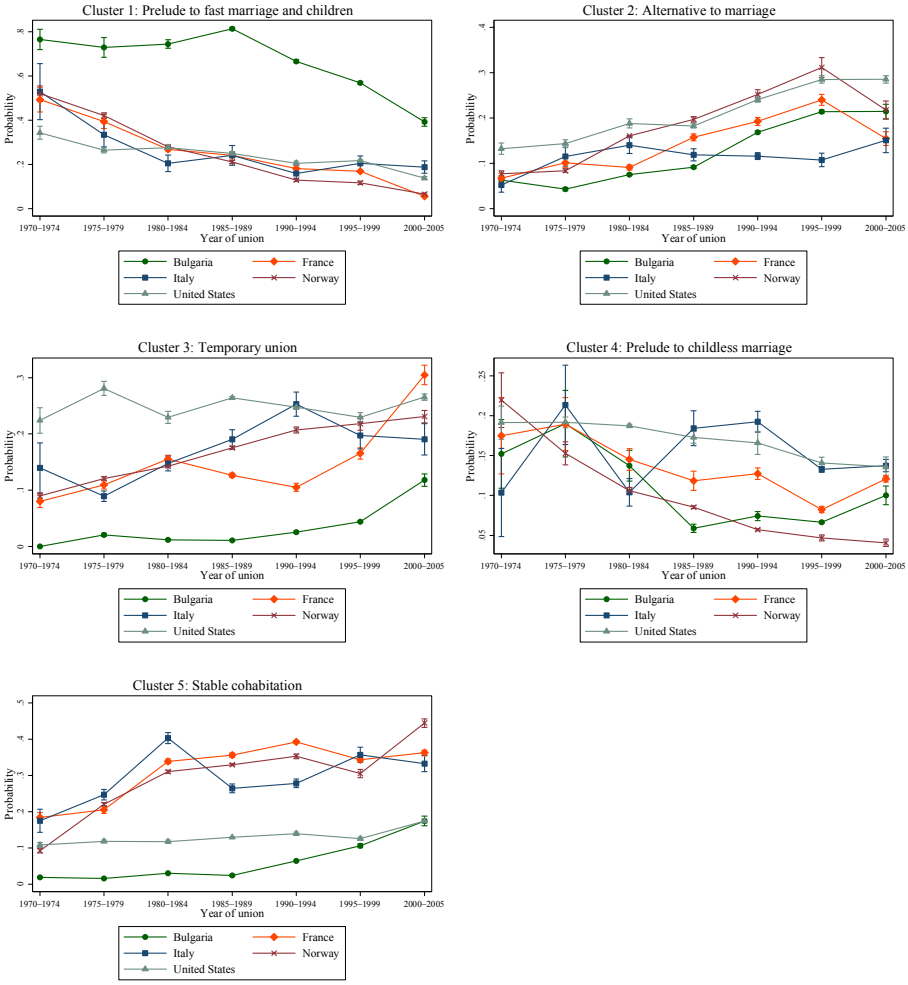
Cohabitation as a temporary union (Cluster 3) increases over the whole period considered for Norway and more recently for France and Bulgaria, suggesting higher instability of cohabitation in the more recent past. This increasing trend is less evident for Italy, whereas it is roughly stable for the United States, which shows higher levels than the rest of the countries for unions started before 1990. The probability of belonging to Cluster 4 (Prelude to childless marriage) tends to decrease slightly for all countries, except for Italy where the probability fluctuates between 10% and 20% but is relatively constant over time.

Finally, the propensity to be part of Cluster 5 (Stable cohabitation) increases during the 1970s in Norway and in France (as well as in Italy, but differences are not statistically significant) and tends to be stable in the following years. The probability is lower in the United States and Bulgaria for the whole range of time, even though the latter country shows an increasing trend after 1985.

In summary, we can see how the probability of experiencing cohabitation as a prelude to marriage, whether or not followed by childbirth, has been decreasing over time in all countries. This behaviour has been partly replaced by entry into a stable cohabitation with no children or temporary unions. However, the main increase involves cohabitation as an alternative to marriage, which suggests a growing acceptance of cohabitation as a stable union and of childbearing inside cohabitation.

Within a general common trend, some cross-national differences still persist. In particular, the United States shows a higher level of instability among cohabiting individuals. At the same time, people who enter a stable cohabitation and do not split up tend to consider this union as an alternative to marriage and therefore have children even without being married. In fact, among Americans there is a very low probability of entering a stable cohabitation without experiencing parenthood within the first five years. This result is even stronger for Bulgaria, which also shows a high proportion of individuals starting a cohabitation as a prelude to early marriage and children. However, it is noticeable that since 1990 there has been a fast convergence towards other countries' behaviours, meaning that acceptance of cohabitation is likely to be growing in Eastern Europe as well. As expected, Norway leads the change in the diffusion of cohabitation as an alternative to marriage, closely followed by France. At the opposite end we find Italy, where the incidence of this kind of pattern was low until the 1990s. However, in Italy that behaviour was not substituted by cohabitation as a prelude to fast marriage. Rather, the most common patterns are those characterized by not having a child within the first five years of union (Clusters 4 and 5), in line with the more general delay in the transition to adulthood in Southern Europe.

Figure 3: Multinomial logistic regression models: Predicted probability of being part of a specific cluster by country and year of union

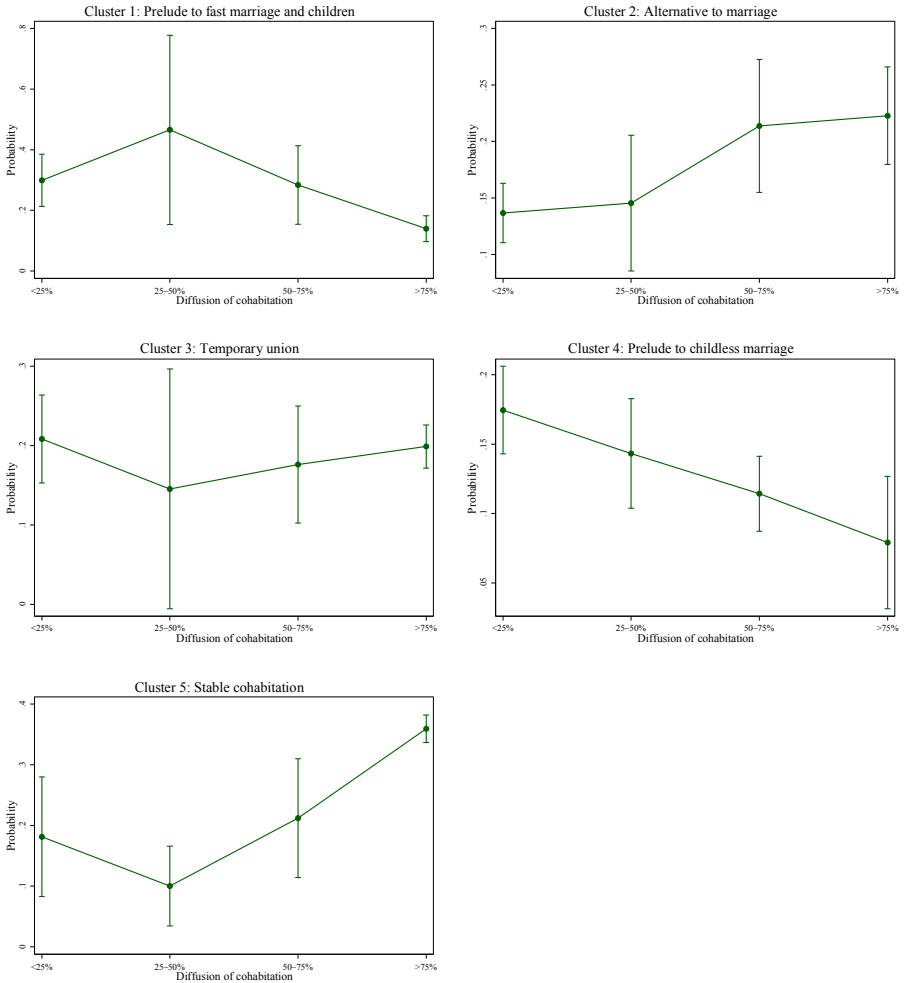


Note: See Table A-1 in Appendix for the complete set of regression estimates. Standard errors clustered by country.
Source: GGS (Bulgaria, France, Norway), FSS (Italy), and NSFG (USA).

Overall, the level of heterogeneity of cohabitation patterns, measured through entropy and turbulence, does not increase over time (Figure A-1 in the Appendix). However, sequence heterogeneity shows differences by country that tend to persist over

time, the only exception being Bulgaria, which shows a rapid increase in entropy after the fall of the Iron Curtain.

Figure 4: Multinomial logistic regression models: Predicted probability of being part of a specific cluster by diffusion of cohabitation (quartiles)



Note: See Table A-2 in Appendix for the complete set of regression estimates. Standard errors clustered by country.
Source: GGS (Bulgaria, France, Norway), FSS (Italy), and NSFG (USA).

As a further step in our analysis, we replicate the multinomial logistic models taking into account the level of diffusion of cohabitation in each country. We replace the indicators of the macro-level context (country of residence and year at the beginning of the union) with a single variable that summarises the average level of cohabitation diffusion that women faced at the beginning of their informal union. Figure 4 shows results that are consistent with those of the previous analyses. In fact, cohabitation as a prelude to marriage (Clusters 1 and 4) becomes less likely with the spread of cohabitation as a first union, although not always in a linear way. On the contrary, when cohabitation diffusion increases it becomes more likely to be cohabiting as an 'Alternative to marriage' or in a 'Stable cohabitation without children'. The only type of cohabitation that does not seem to change as cohabitation diffusion increases is cohabitation as a 'Temporary union' (Cluster 3).

Thus, observing all countries as if they were at the same stage (taking into account that they start from different levels of cohabitation diffusion and that the speed of the diffusion is different over time in different contexts), we find a consistent pattern: cohabitation as a prelude to marriage is on the wane but is increasing as an alternative to marriage or as a stable union without children.

6. Discussion

Applying sequence analysis and cluster analysis techniques to retrospective and comparative data for five countries, we obtained a data-driven classification of patterns in order to investigate convergence across countries. Our results suggest that patterns of cohabitation are evolving in a similar way in different countries in Europe and North America. We found a generalised decreasing trend of cohabitation as a pre-marital experience and an increasing trend of cohabitation as an alternative to marriage, or as a stable union but with no other commitments such as marriage or children. This result emerges even more clearly when looking at the experiences of women when characterised solely by the level of cohabitation diffusion in their country at the beginning of their first union. Our analysis shows that as the level of diffusion increases, cohabitation as a prelude to marriage becomes consistently less common, while the prevalence of both cohabitation as alternative to marriage – confirming our first hypothesis – and as a stable union increases.

Nevertheless, within these common trends, some differences across countries emerge, suggesting country-level peculiarities. Although it is difficult to claim that the heterogeneity of cohabitation patterns has increased over time, there are still considerable differences in the occurrence of nonmarital cohabitation across countries. Very low levels are observed in Italy compared to the other countries, even though they

are increasing rapidly. High levels of cohabitation are reported in Bulgaria, together with a very traditional pattern of cohabitation. Generally speaking, we found little evidence of an overall clear convergence, contrary to what we had assumed in our second hypothesis. In Norway and France, cohabitation has become a real alternative to marriage. This is not the case for Italy, where cohabitation is rather one of the possible ways to delay lifetime events, in particular marriage and childbirth. The United States is in line with France and Norway but is also characterised by cohabitation as a temporary union with high levels of instability and the high probability of a union with children being disrupted. These findings are consistent with previous results in the literature (see, among others, Cherlin 2010; Heuveline, Timberlake, and Furstenberg 2003; Kennedy and Ruggles 2014). Finally, in Bulgaria, cohabiting women tend to marry and have a child early; a fast transition that is still evident even among recently initiated unions. However, this country shows the largest change over time, with a clear sign of convergence with other countries since the 1990s. Cohabitation in Eastern European countries increased as a result of changes in the political regime, and to a certain extent this diffusion is due to the influence of the Western lifestyle (Koytcheva 2006; Thornton and Philipov 2009). These results are in line with those of Perelli-Harris and Amos (2015), which highlight that although unions are changing, "they are not changing in the same way in different countries, nor following universal trajectories of change" (Perelli-Harris and Amos 2015: 171).

Overall, evidence suggests that the selected countries are not simply at different stages of a similar trajectory. On one hand, the prevalence of some patterns consistently decreases (Prelude to marriage) or increases (Stable cohabitation and Alternative to marriage) as cohabitation spreads, while on the other hand, not all features of the existing schemas are adopted by different countries when they are at similar stages of diffusion. Italy and Bulgaria are not simply lagging behind Norway, the United States, and France, as each country is following a distinct and peculiar trajectory. In particular, the most recent behaviours reported for Italy and Bulgaria are only partially similar to those experienced by the other countries decades ago, suggesting that these countries are not at a different stage of the same trajectory. Thus, our results indicate that the diffusion of a common system of norms and values throughout industrialised countries does not shape the patterns of union formation, as predicted by the SDT, but that other cultural factors or different institutional settings are more relevant in determining cohabitation patterns.

In conclusion, we need to note that our analysis is largely descriptive and therefore explores the topic of convergence but cannot explain it causally. Moreover, it is not without shortcomings. First, the longitudinal data available for comparative purposes was collected some years ago, leaving the last ten years (or even more) of cohabitation patterns unexplored. Given the rapid changes occurring in the phenomenon of

cohabitation, this could be a significant deficiency. Second, we focused only on the first informal union and the first childbirth, leaving aside second unions and subsequent births. This choice was dictated by the need to consider a homogeneous group of cohabitants whose union and family choices depended mainly on the acceptability of cohabitation in a certain setting. A focus on first unions may not allow us to fully understand the role of cohabitation in the (marital) life course of adults when cohabitation has largely diffused. For example, the 'Prelude to marriage' trajectory may shift towards second and higher-order unions. Further research should focus on the second and subsequent unions of unmarried people.

Despite these limitations, our analysis sheds light on patterns of cohabitation over more than three decades in a comparative perspective for a geographically and culturally heterogeneous set of nations and accounts for complex union trajectories.

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Appendix

Table A-1: Multinomial logistic regression models: Predicted probability of being part of a specific cluster by country and year of union, complete set of regression estimates

Base outcome: Cluster 1 (Prelude to fast marriage and children)	Cl2: Alternative to marriage	Cl3: Temporary union	Cl4: Prelude to childless marriage	Cl5: Stable cohabitation
Age at 1st union (ref: <19)				
20–24	0.650***	0.693	1.521	0.767
	[0.043]	[0.194]	[0.400]	[0.149]
25–29	0.625***	0.474*	1.653	0.566
	[0.072]	[0.166]	[0.645]	[0.169]
30–34	0.764	0.513*	1.489	0.581*
	[0.257]	[0.156]	[0.528]	[0.146]
35+	1.111	1.064	4.221***	1.234
	[0.567]	[0.482]	[0.910]	[0.576]
Parents' education (ref: low)				
Medium	0.711**	1.177	1.044	0.956
	[0.075]	[0.152]	[0.194]	[0.137]
High	0.660***	1.657***	1.435	1.115
	[0.076]	[0.136]	[0.354]	[0.121]
Missing	1.254	1.025	1.002	1.341
	[0.169]	[0.335]	[0.277]	[0.362]
Level of education (ref: low)				
Medium	0.408*	0.811	1.018	0.773
	[0.151]	[0.238]	[0.359]	[0.220]
High	0.286**	1.21	1.448	1.136
	[0.113]	[0.406]	[0.568]	[0.351]
Country (ref: Norway)				
Bulgaria	0.556***	0.000***	0.465***	0.138***
	[0.072]	[0.000]	[0.043]	[0.009]
France	0.93	0.945	0.836	2.099***
	[0.097]	[0.079]	[0.084]	[0.159]
Italy	0.67	1.539	0.458**	1.861**
	[0.164]	[0.395]	[0.135]	[0.369]
United States	2.707***	3.843***	1.308***	1.794***
	[0.063]	[0.122]	[0.064]	[0.032]
Year of union (ref: ≤ 1974)				
1975–1979	1.382***	1.684***	0.853*	2.971***
	[0.024]	[0.078]	[0.054]	[0.152]
1980–1984	4.185***	3.009***	0.871	6.346***
	[0.177]	[0.231]	[0.103]	[0.508]
1985–1989	6.938***	4.923***	0.923	8.960***
	[0.522]	[0.453]	[0.123]	[0.760]
1990–1994	14.917***	9.508***	0.996	15.716***
	[1.382]	[1.125]	[0.170]	[1.619]
1995–1999	20.949***	11.076***	0.896	15.058***
	[2.291]	[1.625]	[0.193]	[1.911]
2000–2005	25.001***	21.040***	1.398	39.163***
	[2.374]	[3.131]	[0.320]	[5.109]
Country*year of union (ref: Norway, ≤ 1974)				
Bulgaria, 1975–1979	0.511***	5.66e+05***	1.554***	0.296***
	[0.027]	[6.54e+05]	[0.082]	[0.019]

Table A-1: (Continued)

Base outcome: Cluster 1 (Prelude to fast marriage and children)	Cl2: Alternative to marriage	Cl3: Temporary union	Cl4: Prelude to childless marriage	Cl5: Stable cohabitation
Country*year of union (ref: Norway, ≤ 1974)				
Bulgaria, 1980–1984	0.296***	1.76e+05***	1.061	0.258***
	[0.020]	[2.06e+05]	[0.079]	[0.022]
Bulgaria, 1985–1989	0.205***	92124.927***	0.385***	0.134***
	[0.010]	[1.07e+05]	[0.022]	[0.009]
Bulgaria, 1990–1994	0.223***	1.34e+05***	0.546***	0.248***
	[0.008]	[1.54e+05]	[0.028]	[0.017]
Bulgaria, 1995–1999	0.242***	2.35e+05***	0.632***	0.500***
	[0.014]	[2.71e+05]	[0.038]	[0.033]
Bulgaria, 2000–2005	0.293***	4.87e+05***	0.894	0.465***
	[0.032]	[5.68e+05]	[0.065]	[0.029]
France, 1975–1979	1.391***	1.020	1.585***	0.472***
	[0.079]	[0.039]	[0.065]	[0.018]
France, 1980–1984	0.608***	1.206***	1.737***	0.542***
	[0.042]	[0.060]	[0.120]	[0.027]
France, 1985–1989	0.738***	0.668***	1.472***	0.451***
	[0.037]	[0.026]	[0.078]	[0.022]
France, 1990–1994	0.566***	0.381***	1.934***	0.375***
	[0.037]	[0.020]	[0.129]	[0.020]
France, 1995–1999	0.556***	0.556***	1.481***	0.371***
	[0.042]	[0.030]	[0.105]	[0.026]
France, 2000–2005	0.855	1.648***	4.262***	0.455***
	[0.099]	[0.139]	[0.380]	[0.039]
Italy, 1975–1979	2.592***	0.604***	3.850***	0.757*
	[0.357]	[0.090]	[0.636]	[0.085]
Italy, 1980–1984	1.764***	0.926	2.938***	0.958
	[0.191]	[0.109]	[0.457]	[0.088]
Italy, 1985–1989	0.744***	0.618***	4.243***	0.376***
	[0.043]	[0.061]	[0.557]	[0.026]
Italy, 1990–1994	0.510***	0.649***	6.229***	0.343***
	[0.042]	[0.073]	[0.864]	[0.029]
Italy, 1995–1999	0.265***	0.338***	3.693***	0.358***
	[0.019]	[0.039]	[0.506]	[0.030]
Italy, 2000–2005	0.346***	0.186***	2.649***	0.140***
	[0.047]	[0.029]	[0.460]	[0.016]
United States, 1975–1979	1.023	0.974	1.525***	0.481***
	[0.050]	[0.030]	[0.064]	[0.014]
United States, 1980–1984	0.434***	0.423***	1.383***	0.213***
	[0.013]	[0.008]	[0.065]	[0.008]
United States, 1985–1989	0.281***	0.331***	1.332***	0.184***
	[0.008]	[0.011]	[0.046]	[0.003]
United States, 1990–1994	0.216***	0.195***	1.426***	0.138***
	[0.011]	[0.011]	[0.037]	[0.005]
United States, 1995–1999	0.176***	0.145***	1.253**	0.122***
	[0.013]	[0.011]	[0.098]	[0.009]
United States, 2000–2005	0.233***	0.141***	1.222**	0.103***
	[0.009]	[0.004]	[0.077]	[0.004]
Constant	0.486*	0.181***	0.227**	0.225***
	[0.155]	[0.068]	[0.116]	[0.064]

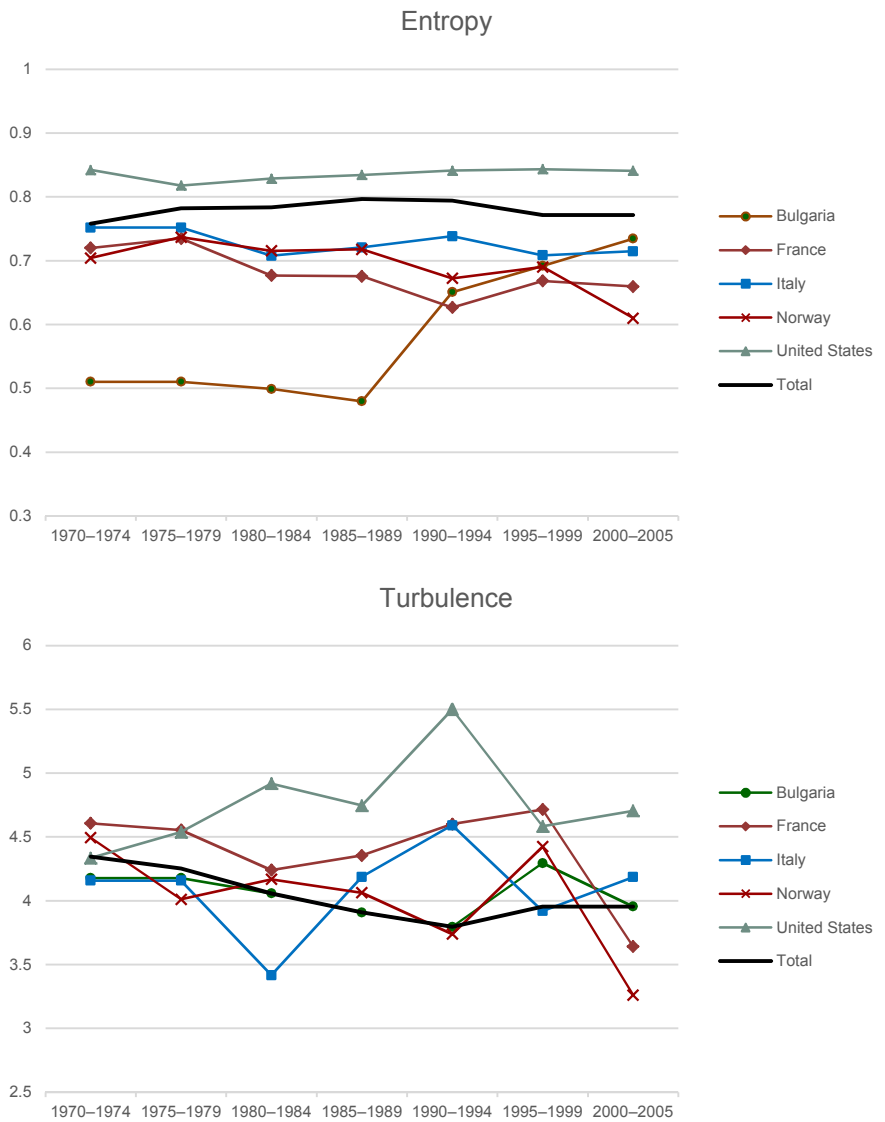
Note: Standard errors clustered by country.
Source: GGS (Bulgaria, France, Norway), FSS (Italy), and NSFG (USA).

Table A-2: Multinomial logistic regression models: Predicted probability of being part of a specific cluster by diffusion of cohabitation (quartiles), complete set of regression estimates

Base outcome: Cluster 1 (Prelude to fast marriage and children)	Cl2: Alternative to marriage	Cl3: Temporary union	Cl4: Prelude to childless marriage	Cl5: Stable cohabitation
Age at 1st union (ref: <19)				
20–24	0.735***	0.811***	1.660***	0.991
	[0.046]	[0.050]	[0.122]	[0.060]
25–29	0.891	0.705***	2.077***	0.957
	[0.079]	[0.062]	[0.194]	[0.081]
30–34	1.247	0.881	2.013***	1.205
	[0.182]	[0.132]	[0.313]	[0.170]
35+	1.839*	1.706	5.175***	2.471**
	[0.562]	[0.514]	[1.504]	[0.696]
Parents' education (ref: low)				
Medium	0.684***	1.02	0.819*	0.692***
	[0.046]	[0.076]	[0.067]	[0.046]
High	0.978	2.433***	1.630***	1.087
	[0.086]	[0.208]	[0.152]	[0.089]
Missing	0.91	0.689*	0.801	0.866
	[0.127]	[0.127]	[0.159]	[0.127]
Level of education (ref: low)				
Medium	0.426***	0.886	1.097	0.800**
	[0.030]	[0.077]	[0.113]	[0.064]
High	0.337***	1.526***	1.732***	1.249*
	[0.029]	[0.141]	[0.188]	[0.108]
Diffusion of cohabitation (ref: < 25%)				
25–50%	0.686***	0.431***	0.508***	0.348***
	[0.052]	[0.031]	[0.039]	[0.028]
50–75%	1.706***	0.873	0.671***	1.225**
	[0.132]	[0.065]	[0.056]	[0.090]
>75%	3.642***	2.037***	0.954	4.266***
	[0.312]	[0.169]	[0.092]	[0.332]
Constant	1.252**	0.543***	0.284***	0.713***
	[0.095]	[0.048]	[0.029]	[0.058]

Note: Standard errors clustered by country.
Source: GGS (Bulgaria, France, Norway), FSS (Italy), and NSFG (USA).

Figure A-1: Entropy of the observed state distribution and sequence turbulence by country and year of union



Source: GGS (Bulgaria, France, Norway), FSS (Italy), and NSFG (USA).