

## Partnership Patterns in the United States and across Europe

# Partnership Patterns in the United States and across Europe: The Role of Education and Country Context

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Patterns of partnership formation and dissolution are changing dramatically across the Western world. Some scholars have argued that women's trajectories of union formation and dissolution are diverging by education, with the higher educated postponing but eventually marrying and the lower educated more likely to cohabit or divorce if they do marry. At the same time, the variation in partnership behavior has also increased across countries, suggesting that country context plays an important role. Here, we use latent class growth models to compare the educational gradient of partnership trajectories in the United States and 14 countries in Europe and investigate the role of education and country context. Our results indicate a consistent positive educational gradient for partnership patterns showing the postponement of marriage, regardless of whether marriage was preceded by cohabitation, but a less consistent gradient for patterns reflecting long-term cohabitation and union dissolution. Although the US results show evidence of an educational divergence in marriage and union dissolution, the evidence from the other countries is weak. In addition, country context explains more of the variation in class membership than education, with context becoming more important over time. The divergence in behaviors across country contexts suggests that social, cultural, political, and economic developments are essential for understanding changes in partnership formation and dissolution.

Patterns of partnership formation and dissolution are changing dramatically across the Western world: marriage is being postponed, divorce is increasing, and cohabitation is now an alternative living arrangement for unmarried adults (Sobotka and Toulemon 2008; Kennedy and Bumpass 2008). Some scholars

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have argued that trajectories of union formation and dissolution are diverging by education, with the higher educated postponing but eventually marrying and the lower educated more likely to cohabit or divorce if they do marry (McLanahan 2004; Cherlin 2009; Isen and Stevenson 2010; Martin 2006). The evidence for these arguments is primarily from the United States, where economic inequality has been increasing (McLanahan and Percheski 2008), but also from other countries such as Australia and New Zealand (Heard 2011). While evidence from some countries in Europe indicates that the educational gradient for having a birth within cohabitation is negative (Perelli-Harris et al. 2010), the evidence for union trajectories as a whole is scant. Indeed, the association between education and analyses of individual events (e.g., divorce, marriage, and cohabitation) differs across countries and over time (Härkönen and Dronkers 2006; Kalmijn 2013; Matysiak, Styr, and Vignoli 2013; Neels and Perelli-Harris 2013). Thus, it is not clear that the association between patterns of partnership formation and education is universal or can be generalized to other industrialized countries.

In addition, levels of union formation and dissolution have not been increasing uniformly across countries and instead appear to be diverging (Billari and Liefbroer 2010). The proportion that has ever married is higher in Southern Europe than in Northern Europe, while the proportion that has ever cohabited is higher in Northern Europe compared to Southern Europe (Neels and Perelli-Harris 2013; Sobotka and Toulemon 2008). The median age at marriage varies from around 22 in parts of Eastern Europe to over 31 in Northern Europe (Billari and Liefbroer 2010). The percentage of women who ever experienced union dissolution ranges from less than 10 percent in Southern and some Eastern European countries to over 40 percent in Norway and the United States (Galezewska, Perelli-Harris, and Berrington 2013). This divergence in behaviors across countries suggests that the social, cultural, political, and economic context is essential for understanding changes in partnership formation and dissolution.

Thus, although an individual's education may be key to understanding changes in certain aspects of union formation or in certain countries, it is not clear that trajectories are diverging by education everywhere. In this paper, we examine the following main research questions: How do the educational gradients for patterns of partnership formation differ across Europe and the United States and over time? Are certain partnership patterns more likely to be consistently associated with education than others? In addition, country of residence appears to be very salient for understanding new developments in union formation. Thus, we also investigate to what extent both country context and individual-level education play a role in union formation.

To answer these questions, we study the association between women's education and holistic partnership trajectories using latent class growth models (LCGM). Most studies of union formation and education model only single events, which show the association with a particular type of union behavior, but do not show how education is associated with partnership trajectories as a

whole. Given that partnership behavior has become much more complex and de-standardized, with individuals experiencing cohabitation, union dissolution, and multiple partnerships (Perelli-Harris and Lyons-Amos 2015; Elizinga and Liefbroer 2007), studying a single event at a time does not show the total association between education and partnership behavior across the lifecourse. Thus, it is necessary to examine holistic partnership trajectories to show how education is associated with partnership formation and dissolution across the lifecourse.

This study contributes to the literature in several ways. First, by using latent class growth models, it presents an innovative way of modeling partnership formation by simultaneously examining the timing, sequencing, and quantum of events. Although previous studies in demography have used this method (e.g., Dariotis et al. 2011), they have rarely been used for comparing family formation across multiple countries and with large datasets. Second, the study examines to what extent the association between partnership patterns and education is similar across countries. These findings contrast the United States with Europe and provide insights into whether the underlying reasons for family change are universal. Third, the study assesses the relative contribution of education and country to the probability of membership in a given class. This provides evidence for the role of both individual-level education and country-specific context.

## Theoretical Framework

### *Education and Partnership Patterns*

With the decline in marriage and rise in divorce throughout the 1970s and 1980s, economic and ideational theories posited that the increase in women's education was responsible for the spread of new behaviors (Becker 1991; van de Kaa 1987; Lesthaeghe 2010). Highly educated women's economic independence allowed them to live outside marriage and divorce if they did marry (Becker 1991). Now oriented toward autonomy and career, more educated women rejected the patriarchal institution of marriage in favor of more flexible arrangements such as cohabitation. If they did marry, their opposition to traditional institutions such as the Church would lead them to be more likely to divorce and repartner in cohabiting unions (Lesthaeghe 2010).

Several recent explanations, however, have tended to stress that women's higher education is beneficial to marriage and protects against divorce (Oppenheimer 1988; Oppenheimer 1997; Goldstein and Kenney 2001; Sweeney 2002; McLanahan 2004; Cherlin 2009; Perelli-Harris et al. 2010). Higher educated women may postpone marriage, but as their economic potential becomes more similar to men's, they become more attractive to prospective spouses, which results in higher marriage rates compared to their less educated counterparts (Oppenheimer 1997; Sweeney 2002; Goldstein and Kenney 2001). In addition, the resources that highly educated women bring to the union reduce risk

and stabilize marriage, resulting in lower divorce rates (Oppenheimer 1997; Matysiak, Styr, and Vignoli 2013).

Many of these shifts have been the result of widespread social and economic developments that have altered the institution of marriage, thereby facilitating the gains to marriage for highly educated women (Cherlin 2009; Stevenson and Wolfers 2007). In many industrialized countries, marriage now appears to be shifting away from a dependent, patriarchal relationship toward a more egalitarian partnership with both partners contributing to the relationship (Heard 2011; Kalmijn 2013). Changes in lifestyles have led marriage to be advantageous for those who complement each other, rather than those who specialize in different domains (Stevenson and Wolfers 2007). In addition, new labor-market demands and middle-class aspirations have resulted in many choosing a dual-earner model, which often benefits those with greater economic potential. Having a higher shared income allows the couple to maintain a higher standard of living and protect against unemployment or illness, resulting in increased relationship stability.

In the United States, the emerging positive educational gradient of marriage (Isen and Stevenson 2010) has led some researchers to claim that marriage is becoming a status symbol reserved for the economic elite (Cherlin 2009). Increases in income inequality have made it even more difficult for low-educated couples to achieve the standard of living perceived necessary for marriage (McLanahan and Percheski 2008). Qualitative studies from the United States also indicate that low-income couples would like to marry, but often lack the financial stability to do so (Reed 2006; Gibson-Davis 2007; Smock, Manning, and Porter 2005). In addition, low-income couples who do marry face a greater risk of divorce, due to strains brought about by employment instability and job loss (Edin and Kefalas 2005).

The corollary to this argument is that in places with a high economic bar for marriage, couples who are not ready or able to marry live in cohabitation. Couples with weak economic prospects—usually the least educated—are most likely to cohabit (Oppenheimer 2003; Kalmijn 2011). Studies from the United States show that the least educated do not have the financial or emotional resources to convert their cohabiting relationships into marriage, and instead find themselves cohabiting or cycling through multiple partnerships (Kennedy and Bumpass 2008; Lichter, Turner, and Sassler 2010). Thus, even though couples of all educational levels increasingly begin their relationships with cohabitation, as relationships progress and individuals reach later adulthood, the more highly educated are most likely to marry. This results in a negative educational gradient for cohabitation, especially by the time of the first birth (Perelli-Harris et al. 2010). In addition, given that cohabiting unions are more likely to dissolve (Heuveline, Timberlake, and Furstenberg 2003; Galezewska, Perelli-Harris, and Berrington 2013), the least educated are more likely to experience the dissolution not only of their marriages, but also of their cohabiting unions.

Although a great body of literature in the United States provides evidence for a positive educational gradient for marriage and a negative educational gradient for cohabitation and divorce (see McLanahan and Percheski 2008; Carlson and

England 2011), the findings in Europe are more inconsistent and depend on type of transition, time period analyzed, and method of measurement. In most countries, higher education leads to the postponement of marriage (Goldstein and Kenney 2001; Coppola 2004; Kalmijn 2007), and the increase in the age at marriage is correlated with the expansion of education (Sobotka and Toulemon 2008). The association with ever marrying or staying married, however, is less consistent (Kalmijn 2013). The educational gradient for the percent of women who have ever cohabited is mixed (Neels and Perelli-Harris 2013) and may depend on the point in the lifecourse analyzed (Mikolai, Perelli-Harris, and Berrington 2014). Thus, it is unclear whether the educational gradient for cohabitation and the transition to marriage is consistent across the lifecourse.

Likewise, the evidence for the relationship between education and divorce is mixed. In the United States, the educational gradient of divorce has reversed from positive to negative (Martin 2006). In Europe, the educational gradient for divorce appears to switch as the prevalence of divorce increases; the gradient is positive in countries where divorce has just begun to emerge and negative in countries where divorce is more common (Härkönen and Dronkers 2006; Matysiak, Styrac, and Vignoli 2013). This reversal may be due to changes in the costs of divorce: when the social and economic costs of divorce are high, only highly educated women have the resources to divorce, but when the costs decline, the least educated may be more likely to divorce (Härkönen and Dronkers 2006). Nonetheless, it is unclear whether this reversal occurs everywhere, especially given the lack of a strong relationship between education and divorce in some countries.

### ***Country Context and Partnership Patterns***

Although social and economic change may be leading to different partnership trajectories by education, the role of country has also been found to be one of the most enduring factors shaping family formation. Numerous studies have found that countries, or states defined by national borders, have been important for defining demographic processes across space (e.g., Klüsener, Perelli-Harris, and Sánchez Gassen 2013; Coale and Watkins 1986). By developing standard policies, education, communication, and media, the modern state has organized and structured populations, resulting in greater homogenization of behaviors within countries (Watkins 1991). Country borders continue to be important for defining behaviors, such as levels of nonmarital fertility (Klüsener, Perelli-Harris, and Sánchez Gassen 2013). Countries delineate the space in which people are exposed to economic, social, political, and cultural factors, which in turn influence individual behaviors that aggregate to population-level behavior.

Social change also does not happen randomly in space, but is generally concentrated within the borders of countries. Within countries, underlying cultural propensities and historical kinship systems (Reher 1998) coupled with social and political developments led to the diffusion of new ideas and the practice of new behaviors (Lesthaeghe and Neels 2002). Some populations adopt new behaviors quickly, while others maintain traditional behaviors for decades. For

example, cohabitation and divorce have only recently started to increase in Southern Europe, due to the persistence of “strong family ties” (Reher 1998). Catholicism has slowed the diffusion of cohabitation and divorce in Italy, Poland, and Lithuania (Vignoli and Salvini 2014; Mynarska and Bernardi 2007; Katus et al. 2007). On the other hand, Protestantism may have promoted liberal values in countries such as Estonia (Katus et al. 2007) and other Nordic countries. In general, the Nordic countries experienced an earlier orientation toward gender equality and female participation in the labor force (Bernhardt, Noack, and Lyngstad 2008), which facilitated women’s independence and potentially led to the increase in cohabitation and divorce. However, much of Western Germany also has Protestant roots and cohabitation has continued to remain low, due to a persistent conservative orientation toward motherhood and the breadwinner model (Konietzka and Kreyenfeld 2002). Thus, the factors influencing family behavior and facilitating changes in family behavior cannot be decanted down to one factor, but instead are multifaceted and complex.

In addition, globalized processes of change may interact with local conditions to produce specific effects. Although the emergence of feminism and individualization may have been important for liberalizing attitudes across countries, globalization of labor markets throughout the 1980s and 1990s may have produced uncertainty that led to postponed marriage or temporary relationships (Mills and Blossfeld 2005; Perelli-Harris et al. 2010). Yet, the impact of uncertainty may have different effects on union formation in different countries. For example, youth unemployment and temporary employment have been linked to the postponement of marriage with low premarital cohabitation in Spain (Castro-Martin, Domínguez-Folgueras, and Martín-García 2008), while economic uncertainty has been associated with higher levels of cohabitation and nonmarital fertility in Eastern Germany (Konietzka and Kreyenfeld 2002). Economic insecurity also interacted with rapid social change in the post-socialist world, for example, by producing a pattern of disadvantage for childbearing in cohabitation in Russia (Perelli-Harris and Gerber 2011). Thus, ideational change coupled with changes in economic conditions has led to new patterns of union formation behavior and raised questions about whether previous theories of marriage are adequate for explaining these new developments.

Along with cultural and economic developments, policies and legal systems are also important for understanding the variation in partnership behaviors across countries. Historical and cultural developments led to variation in the rights and responsibilities provided to married and cohabiting couples, which may in turn be related to the choices couples make about whether to marry or divorce (Perelli-Harris and Sánchez Gassen 2012). For example, the enactment of divorce laws, especially those that allowed divorce without the consent of one’s spouse, led to short-term increases in divorce, although these increases may have been the result of pent-up demand rather than long-term effect (Kneip and Bauer 2009). Nonetheless, divorce laws can reflect and reinforce cross-national differentials in divorce. Likewise, laws on cohabitation and marriage differ considerably across Europe; some countries, such as the Netherlands and Norway, have equalized many laws on cohabitation and marriage, while others,

such as Germany, Switzerland, Lithuania, and Russia, continue to maintain distinctions between marriage and cohabitation, especially in tax law (Perelli-Harris and Sánchez Gassen 2012; Sánchez Gassen and Perelli-Harris 2015). Different legal regimes may shape choices about marriage and cohabitation, although the correlation is far from perfect (Sánchez Gassen and Perelli-Harris 2015).

Finally, certain factors may mediate the relationship between education and union formation. The diffusion of a behavior may result in the reversal of the educational gradient, as seen with divorce (Matysiak, Styr, and Vignoli 2013; Härkönen and Dronkers 2006). The development of new values such as gender equality in some countries may be associated with a positive educational gradient for marriage (Kalmijn 2013). Nonetheless, while gender equality may be important for influencing the educational gradient of marriage, we do not know whether an individual's education or country context matters more for determining overall trajectories of union formation. Given the persistent and dynamic effects of culture, economic conditions, and policy context, as well as the effects of individual-level education on specific partnership transitions, it is important to examine the relative contribution of one's own education and country context.

## Data

To answer our two main research questions, we analyze retrospective union and fertility histories from 15 surveys that have been standardized in a dataset called the Harmonized Histories (Perelli-Harris, Kreyenfeld, and Kubisch 2010; and see [www.nonmarital.org](http://www.nonmarital.org)). We focus on women, because the union histories for men are not available in all countries. The data for Austria, Belgium, Bulgaria, Estonia, France, Italy, Lithuania, Norway, Romania, and Russia come from the Generations and Gender Surveys (GGS), which interviewed nationally representative samples of the resident population in each country. These surveys broadly reflect vital registration indicators for marriage (Vergauwen et al. 2015). Because the GGS is not available for all countries, we also employed other data sources. The Dutch data come from the 2003 Fertility and Family Survey (FFS). The data for the UK are from the British Household Panel Survey (BHPS). The Spanish data come from the Survey of Fertility and Values conducted in 2006, and the Polish data are from the Employment, Family, and Education survey conducted in 2006. The US data are from two rounds of the National Survey of Family Growth, conducted in 1995 and between 2006 and 2008. Table 1 shows the number of women aged 15–45 in each survey by education and cohort for the analysis sample.

Despite slightly different survey designs, the union histories are relatively comparable. Our data include the month of entrance into cohabiting and marital unions as well as separation and divorce. Questions about cohabitation generally refer to co-resident relationships with an intimate partner that last more than three months. Our analysis examines the relationship states that occur between the ages of 15 and 45. However, because most of our surveys interviewed women who were older than 45 at the time of the survey, we compare women born in 1945–54, 1955–64, and 1965–74. In Austria and Poland, only

**Table 1. Distribution of Educational Attainment in Each Country by Cohort before Weighting (frequencies in parentheses)**

Country	Educational level	Birth cohort		
		1945–54	1955–64	1965–74
Austria GGS <sup>a</sup>	Low		18.8 (31)	14.3 (158)
	Medium		66.0 (109)	65.4 (737)
	High		15.1 (25)	20.3 (229)
Belgium GGS	Low	41.3 (185)	29.9 (169)	14.7 (68)
	Medium	28.1 (126)	35.1 (198)	37.3 (174)
	High	30.4 (136)	34.9 (197)	47.9 (231)
Bulgaria GGS	Low	25.6 (195)	17.3 (195)	14.1 (207)
	Medium	50.5 (384)	55.2 (623)	55.3 (810)
	High	35.6 (181)	27.4 (309)	30.5 (461)
Estonia GGS	Low	13.9 (119)	6.3 (56)	8.2 (71)
	Medium	50.4 (429)	49.7 (438)	55.1 (440)
	High	35.6 (303)	43.8 (385)	36.6 (289)
France GGS	Low	44.0 (349)	29.9 (218)	17.7 (136)
	Medium	36.9 (293)	40.5 (295)	44.3 (342)
	High	19.0 (151)	29.4 (215)	37.9 (304)
Italy GGS	Low	66.6 (2209)	49.5 (1740)	41.0 (1166)
	Medium	24.2 (804)	40.2 (1417)	47.1 (1361)
	High	9.1 (302)	10.1 (357)	11.8 (336)
Lithuania GGS	Low	11.6 (67)	3.1 (21)	4.5 (31)
	Medium	66.8 (384)	67.5 (511)	68.1 (463)
	High	21.6 (124)	29.3 (221)	27.3 (186)
Netherlands FFS	Low	51.9 (489)	39.4 (425)	25.2 (248)
	Medium	30.7 (289)	38.6 (418)	50.9 (507)
	High	17.3 (163)	21.9 (237)	23.7 (237)
Norway GGS	Low	16.2 (195)	21.8 (280)	11.8 (171)
	Medium	49.2 (590)	41.1 (528)	37.1 (541)
	High	34.5 (414)	37.0 (475)	51.0 (752)
Poland EFES <sup>a</sup>	Low			42.4 (586)
	Medium			36.5 (505)
	High			20.9 (291)
Romania GGS	Low	54.4 (630)	31.1 (288)	28.3 (310)
	Medium	37.6 (436)	57.5 (535)	61.0 (667)
	High	7.9 (92)	11.3 (106)	10.5 (116)

*(Continued)*



**Table 1. continued**

Country	Educational level	Birth cohort		
		1945–54	1955–64	1965–74
Russia GGS	Low	8.6 (99)	2.3 (33)	3.3 (35)
	Medium	68.9 (792)	75.6 (1031)	73.1 (747)
	High	22.3 (257)	22.0 (302)	23.5 (239)
Spain SFS	Low	75.8 (723)	53.7 (716)	37.2 (506)
	Medium	15.9 (152)	29.0 (390)	39.9 (551)
	High	8.1 (78)	17.2 (230)	22.8 (318)
UK BHPS	Low	26.3 (201)	12.1 (105)	6.2 (56)
	Medium	15.9 (239)	34.9 (304)	37.7 (341)
	High	42.3 (323)	52.9 (460)	56.0 (551)
US NSFG	Low	12.9 (211 <sup>b</sup> )	12.5 (496 <sup>b</sup> )	16.5 (317 <sup>c</sup> )
	Medium	37.5 (612 <sup>b</sup> )	40.8 (1596 <sup>b</sup> )	26.0 (495 <sup>c</sup> )
	High	49.5 (809 <sup>b</sup> )	46.6 (1832 <sup>b</sup> )	57.3 (1094 <sup>c</sup> )

<sup>a</sup>Histories were not collected for the 1945–54 birth cohort in the Austrian GGS and the 1945–54 and 1955–64 birth cohorts in the Poland EFES.

<sup>b</sup>Data are from 1995 National Survey of Family Growth and refer to the 1951–54 cohorts.

<sup>c</sup>Data are from the 2006–08 National Survey of Family Growth and refer to the 1955–64 and 1965–74 cohorts.

women up to age 49 were interviewed; thus, we include only one or two cohorts from these surveys. In the US NSFG, only women up to age 44 were interviewed; thus, the 1995 NSFG allows us to examine only the 1951–54 cohorts, while the 2006–08 NSFG allows us to examine the 1955–64 and 1965–74 cohorts.

Although the Harmonized Histories surveys are relatively comparable, each survey's sampling strategy and response rates differ, which can have different implications for the creation of the latent classes. Some surveys do not require weights (for example, Bulgaria, Poland, and Romania), while some surveys include sample weights at the individual level (Austria, France, US), or both the household and individual level (UK). Since our inference regards individual-level behaviors, we apply the individual-level weights where relevant. Where unavailable, we use a constant as the individual-level weight. In addition, some surveys (i.e., Italy) have very large samples, which may dominate the results in a pooled dataset. To analyze the pooled dataset, we have transformed the weighting schemes to retain their internal consistency, but also provide meaningful cross-national solutions. To create a sample with each survey equally represented, we rescale the weighted population totals so that each survey contributes the same proportion to the total sample. This approach allows the internal validity of the surveys to be maintained (all the weights are adjusted), but ensures that no one survey dominates the sample.

## Methods

We use a two-stage process to answer our two main research questions: 1) We answer the first research question by using latent classes as the dependent variable in a multinomial logit model with education and country included as explanatory variables. 2) We answer the second research question by showing the relative contribution of education compared to country context in influencing the probability of latent class membership.

### *LCGM Models*

Latent class growth curve models (LCGM), which are the dependent variable in our analyses, trace partnership patterns for each individual and then cluster the patterns into latent classes.<sup>1</sup> To create the growth curves, we first expand the data into person-years.<sup>2</sup> We then fit separate trajectories for each union status: never in union, cohabiting, directly married, married having previously cohabited, and single after being in a previous union.<sup>3</sup> We distinguish between directly marrying and marrying after cohabiting to show how entrance into marriage changes over time. This approach reveals to what extent cohabitation is emerging as a precursor to marriage or as a long-term relationship that lasts until the respondent is 45.

The response variable for the model is defined as the random variable  $y_t$ , which is defined at each year of the respondent's partnership history.

$$y_{i,age} = s \begin{cases} 0 & \text{Never in a union} \\ 1 & \text{Cohabiting} \\ 2 & \text{Married preceded by coabitation} \\ 3 & \text{Directly married} \\ 4 & \text{Single after separation} \end{cases}$$

Respondents switch between these different states as they move along the life-course from ages 15 to 45. A respondent can move between these mutually exclusive states; for example, if she marries at age 20, divorces at 25, cohabits at 28, and then remarries at 30, she would be in the states never in union, directly married, single after being in a previous union, cohabiting, and married having previously cohabited. We were unable to model higher-order partnerships directly due to small sample size that distorted the LCGM results. If two of these partnerships are present within the same year, the higher-value state is selected (for example, if cohabitation transitions to marriage in the same year, the year is classified as  $y_{ij} = 2$  rather than 1). In certain circumstances, the selection of higher states will lead to the truncation of a relationship, for instance if a relationship starts during the same year as a separation. In order to avoid missing relationships, we overwrite years classified as separation with the new relationship status, although again these relationships may be truncated. As a result, periods of separation lasting less than one year could be missed. However, sensitivity

analyses comparing multiple approaches show that the underestimation does not bias our results.

We then use Mplus (Muthén and Muthén 2011) to calculate growth equations that describe different trajectories. Trajectories are combined to form each latent class, which describe different partnership patterns across the life-course. Each woman has a probability of being in each latent class; the more closely her observed partnership history is to the class trajectories, the higher the probability of class membership. The probability of being in partnership  $s$  at a given age is defined as  $\pi_i^s = Pr(y_{i,age} = s)$  (see Equation 1).  $i$  indexes the individual woman. The probability of partnerships across the life-course is modeled as a growth equation, where  $y_{i,age}$  is a function of  $age$  and  $age^2$ .<sup>4</sup> A separate growth equation is specified for each class  $C_j$ , where  $j$  indexes the class and there are  $1 \dots J$  classes. For logit estimation, we set direct marriage as the reference category.

$$\ln \left( \frac{\pi_{i,age}^s | C_j = j}{\pi_{i,age}^{s=3} | C_j = j} \right) = \alpha_j^s + \beta_{1,j}^s age_i + \beta_{2,j}^s age_i^2$$

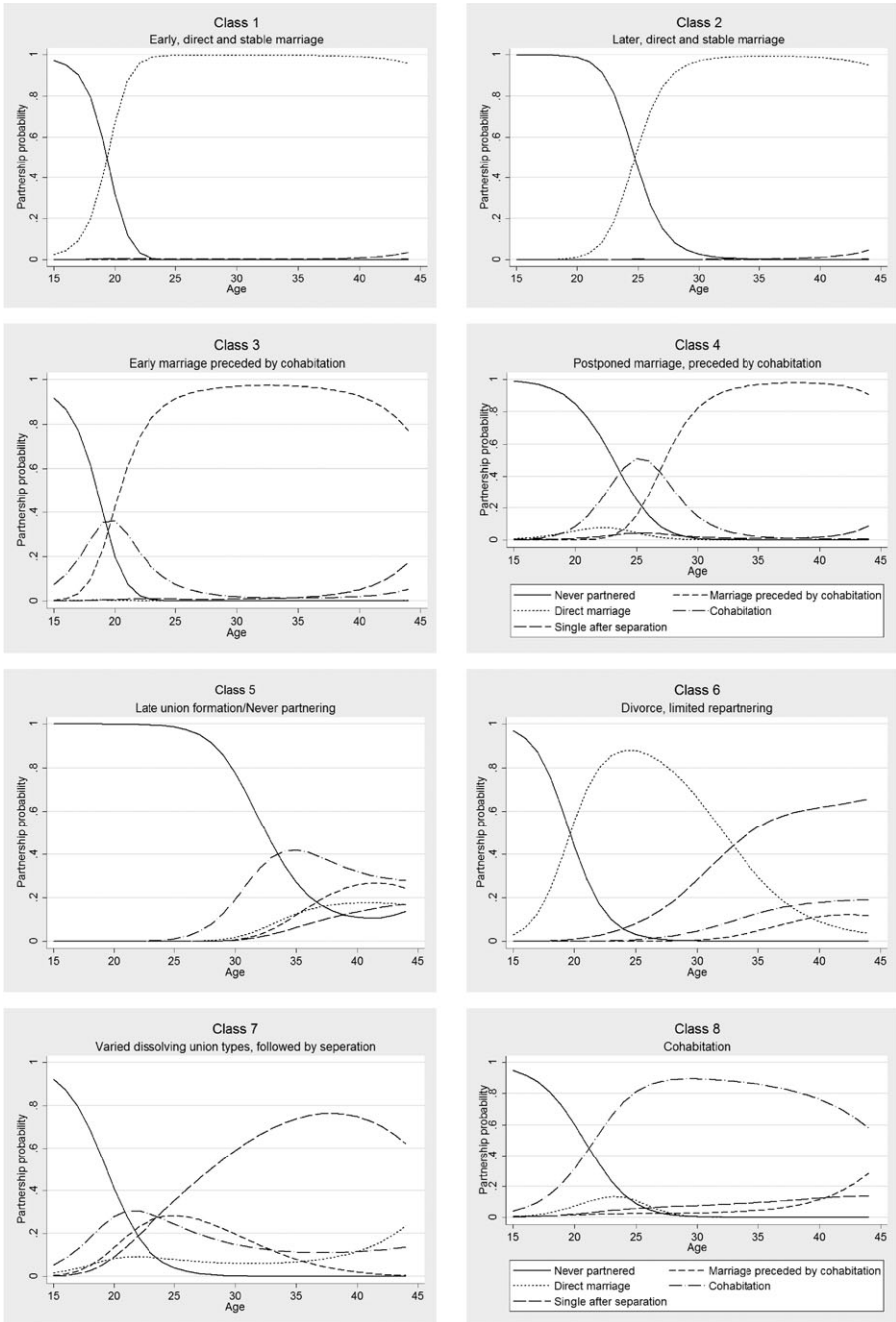
$$j = \{1 \dots J\}, s = \{0 \dots 4\} \quad (1)$$

In Equation 1, the class-specific intercept is described by  $\alpha_j^s$ , while the class-specific growth curve is described by  $\beta_{1,j}^s$  and  $\beta_{2,j}^s$ . All three of these parameters vary depending on membership in a particular class. In Equation 1, the trajectories differ only according to class membership,  $C_j$ .<sup>5</sup>

We use the Lo-Mendell-Rubin Likelihood Ratio Test (LMR-LRT; Lo, Mendell, and Rubin 2001) to determine the number of classes (Nylund, Asparouhov, and Muthén 2007). The LMR-LRT is similar to conventional likelihood ratio tests that interpret  $p$ -values below a certain threshold as indicative of an improvement in model fit, where the  $p$ -value is adjusted to reflect the fact that the likelihood does not follow a chi-square distribution.<sup>6</sup> The LMR-LRT  $p$ -values indicate that eight classes optimally fit the pooled data; the addition of an eighth class improves model fit at the 1 percent level (LMR  $p$ -value is below 0.01), but the addition of a ninth class is not significant.<sup>7</sup>

Figure 1 shows the eight latent class trajectories extracted from the model. The area under the curve represents the probability of being in a relationship state at a given age between the ages of 15 and 45. The solid line shows the probability of being never partnered; the dash-dot-dash line represents the probability of being in cohabitation that does not transition to marriage before age 45; the small dotted line represents the probability of having a direct marriage; the medium dashed line represents the probability of being in a marriage that was preceded by cohabitation; and the gray dashed line represents the probability of being single after having separated from a previous relationship. Women can transfer between states at any point; for example, a woman may be never married, then directly marry, spend some time single after marital dissolution, and then transfer back into cohabitation or marriage for higher-order

**Figure 1. Latent classes based on models of growth trajectories**



unions. Repartnering is incorporated into cohabitation, premarital cohabitation, or marriage lines.<sup>8</sup>

The classes and their sensitivity to robustness checks have been discussed in detail in [Perelli-Harris and Lyons-Amos \(2015\)](#); therefore, we only briefly describe them here. The first four classes primarily reflect marriages unlikely to end in separation by age 45: classes 1 and 2 include only direct marriage, while classes 3 and 4 reflect marriage preceded by cohabitation. Classes 1 and 3 show patterns of marriage that occur relatively early—the marriage trajectory starts to increase in the teens and peaks by age 25. Classes 2 and 4, on the other hand, reflect later marriage; in class 2, direct marriage starts shortly after age 20 and peaks in the late 20s, while in class 4, cohabitation peaks in the mid-20s, with marriage following in the late 20s. Class 5 reflects delayed partnership formation, with a strong increase in cohabitation occurring after age 30, some marriage in the late 30s, as well as those people who were unlikely to experience partnerships before age 45.

Classes 6 and 7 reflect partnership patterns dominated by separation and repartnering. Class 6 shows a strong increase in direct marriage in the 20s that peaks around age 25 and a gradual increase in being single after separation until over 60 percent of women are predicted to be single after separation. Some of the women in this class reentered cohabitation or marriage in their 30s. Class 7 starts out with cohabitation followed by marriage, but the class is dominated by a strong trend in single after separation. Although the probability of direct marriage is low, the majority of women in this class are expected to remain single after separation into their 30s and 40s. Finally, class 8 is characterized by cohabitation with a small uptick in being single after separated. Note that the cohabitation class is not identical to the marriage classes, since it shows a strong decline in cohabitation in the 30s, due to transitions into marriage or dissolution.

### ***Multinomial Regression Model***

Once we have created the latent classes, we allocate respondents to a class based on their posterior probability of class membership and estimate multinomial regression models in Stata SE 12.<sup>9</sup> It is unlikely that women would be misallocated in our analysis, as the classes extracted in our models show excellent definition based on the class mean posterior membership probability (the lowest is 0.959 for classes 6 and 7). This is expressed as a random variable,  $j_i$ , where the probability of class membership for individual  $i$  is  $\pi_i^j = \Pr(C_j=j)$ . We then apply the following multinomial regression model (Equation 2):

$$\ln\left(\frac{\pi_i^j}{\pi_i^{j=1}}\right) = \beta_j \mathbf{x}_i' \quad j = \{1 \dots J\} \quad (2)$$

In this model,  $\mathbf{x}_i$  is a vector of dummy variables of individual characteristics (education, birth cohort, and country) and  $\beta^j$  is a set of coefficients measuring their effect on class membership.

As discussed above, our main variable of interest is individual's level of education, specified as three categories standardized across countries. Each survey includes a six-category measure of highest level of education attained by interview based on the International Standardized Classification of Education (ISCED 1997). We collapsed these categories into three basic categories: low (ISCED 1 & 2—completed basic secondary), medium (ISCED 3 & 4—completed secondary school and any education beyond secondary education but less than completed college [including vocational and technical schools]), and high (ISCED 5 & 6—university degree and higher). We recognize that these educational categories are crude and have context-specific meanings, but given data limitations, they are optimal for comparisons across a large number of countries. Note that the distribution of respondents by education differs across countries, with some countries having a much higher proportion of women with higher education than others (table 1). However, because our intent is to compare the educational distribution within countries rather than across countries, these differences are less important.

The multinomial model predicts class membership based on education, birth cohort, and country. We interact educational level with country and birth cohort to produce educational gradients for each national setting and measure change in these gradients over time. The models are then used to generate predicted probabilities, associated standard errors, and prediction intervals. Because educational gradients are unlikely to be linear, we assess gradients based on a significant difference between proportions using a two-tailed *t*-test.

### ***Relative Contribution of Education and Country***

Our second research question assesses the relative contribution of individual-level education and country to the probability of falling in a given latent class. The multinomial logistic regression model can be used to predict the probability of class membership; however, because education, cohort, and country are interacted with each other, the resulting complexity of the beta coefficients makes it difficult to assess whether education or country is the largest contributor to variation in predicted probabilities. While we could incorporate a multilevel modeling strategy, with individual-level effects (education) nested within context (country), this method is unsuitable. First, the specification of country as a random effect is methodologically questionable, because the multilevel model assumes that higher-level units are exchangeable, which our countries are not (Hox, van de Schoot, and Matthijsse 2012). In addition, the number of countries in our dataset is too low for an interpretation of the random component (Hox, van de Schoot, and Matthijsse 2012; Bryan and Jenkins 2016). Second, since our analysis does not include macro-level data, there is no advantage to using a multilevel model. Third, the specification of education as a fixed coefficient and country as a random effect in a multilevel model means that it is difficult to make direct comparisons between the two.

We therefore perform a series of ANOVA tests to determine which factor better explains variability in class membership. A higher proportion of variance

(defined as partial sum of squares as a proportion of total sum of squares) explained by a factor in the ANOVA indicates a greater contribution to variation in predicted probabilities. ANOVAs are performed on the predicted probabilities of class membership for each latent class generated from the predictive model described in Equation 2. ANOVA tests make the assumption that the response variable is normally distributed; thus, we transform the predicted probabilities (which are non-normal).<sup>10</sup> We perform the analysis by birth cohort to detect whether there is a change in the contribution of an individual's education or country to the latent class, although we do not perform formal tests to determine whether the change over time is significant.

## Results

### *Education and Partnership Patterns*

As discussed above, the first aim is to determine whether the eight latent classes are significantly associated with an individual's level of education. We run multinomial models with the eight classes as the dependent variable and education, country, and cohort as predictor variables. Tables 2a and 2b show the predicted probability of falling into each latent class by education, country, and cohort. The shaded results indicate a significant difference between high and medium or low and medium education (.05 level based on a two-tailed *t*-test). Light gray indicates that the educational gradient is negative; black indicates the educational gradient is positive; and medium gray indicates the gradient is U-shaped.

*Higher education is associated with delayed marriage classes, regardless of premarital cohabitation.* Table 2a shows the probability of falling into the four stable marriage pattern classes. Immediately we can see that in most countries, the two early marriage patterns (classes 1 and 3) are dominated by light gray squares that indicate a negative educational gradient, while the two later marriage patterns (classes 2 and 4) are dominated by black squares that indicate a positive educational gradient. Note, however, that the negative educational gradient is sometimes associated with a significant difference between the higher and medium educated, and sometimes between medium and low. In addition, the results are not completely consistent across all countries; some countries show a U-shaped educational gradient, and some have a positive educational gradient for the early marriage class, due to the least educated being in the cohabitation or dissolution classes. Despite these nuances, the results show that higher education is related to the postponement of marriage.

We also find that the relationship between education and marriage timing holds regardless of whether the marriage was preceded by cohabitation; in most countries, the least educated have earlier marriage patterns than the more educated, even when they experience premarital cohabitation. The educational gradient for delayed marriage preceded by cohabitation is overwhelmingly positive, with the exception of Estonia. The prevalence of this pattern is increasing across cohorts in every country, reflecting the popularity of premarital cohabitation and the delay of marriage, but not the rejection of marriage. And while this class

**Table 2a. The Predicted Probability of Women Aged 15–45 Ending Up in Each Class by Country, Cohort, and Educational Level, Classes 1–4**

		Class 1			Class 2			Class 3			Class 4		
		Early marriage			Delayed marriage			Early marriage with premarital cohabitation			Delayed marriage with premarital cohabitation		
		1945–54	1955–64	1965–74	1945–54	1955–64	1965–74	1945–54	1955–64	1965–74	1945–54	1955–64	1965–74
Austria	High		0.16	0.05		0.12	0.09		0.08	0.11		0.36	0.38
	Medium		0.11	0.08		0.10	0.05		0.33	0.25		0.18	0.24
	Low		0.16	0.22		0.13	0.08		0.42	0.26		0.00	0.14
Belgium	High	0.29	0.19	0.09	0.33	0.30	0.18	0.13	0.12	0.08	0.10	0.11	0.26
	Medium	0.44	0.48	0.22	0.22	0.17	0.09	0.13	0.13	0.20	0.63	0.02	0.15
	Low	0.56	0.37	0.26	0.12	0.11	0.09	0.11	0.14	0.17	0.04	0.08	0.12
Bulgaria	High	0.35	0.40	0.32	0.40	0.25	0.23	0.09	0.14	0.19	0.04	0.09	0.12
	Medium	0.56	0.56	0.53	0.20	0.08	0.09	0.12	0.19	0.18	0.03	0.04	0.04
	Low	0.56	0.41	0.36	0.06	0.05	0.01	0.25	0.33	0.34	0.02	0.04	0.03
Estonia	High	0.30	0.29	0.16	0.29	0.17	0.07	0.09	0.16	0.19	0.08	0.10	0.13
	Medium	0.36	0.28	0.20	0.14	0.06	0.03	0.13	0.16	0.20	0.09	0.10	0.07
	Low	0.27	0.16	0.14	0.11	0.07	0.00	0.18	0.16	0.26	0.08	0.07	0.07
France	High	0.26	0.18	0.03	0.25	0.12	0.09	0.08	0.11	0.14	0.11	0.23	0.34
	Medium	0.51	0.31	0.09	0.17	0.07	0.05	0.04	0.15	0.23	0.05	0.13	0.22
	Low	0.59	0.32	0.18	0.14	0.10	0.05	0.03	0.17	0.17	0.03	0.09	0.10
Italy	High	0.13	0.09	0.03	0.71	0.60	0.61	0.00	0.01	0.01	0.02	0.07	0.08
	Medium	0.39	0.35	0.19	0.51	0.51	0.59	0.01	0.01	0.03	0.01	0.03	0.06
	Low	0.63	0.60	0.43	0.33	0.29	0.39	0.01	0.02	0.05	0.01	0.02	0.04
Lithuania	High	0.31	0.29	0.30	0.43	0.36	0.29	0.00	0.03	0.06	0.02	0.02	0.06
	Medium	0.43	0.38	0.44	0.29	0.22	0.17	0.02	0.05	0.05	0.02	0.03	0.03
	Low	0.45	0.42	0.32	0.24	0.17	0.03	0.06	0.04	0.06	0.00	0.00	0.00



NL	High	0.33	0.13	0.04	0.25	0.18	0.12	0.09	0.08	0.06	0.14	0.31	0.39
	Medium	0.47	0.33	0.11	0.24	0.14	0.09	0.04	0.18	0.16	0.09	0.17	0.32
	Low	0.57	0.45	0.18	0.22	0.10	0.11	0.03	0.15	0.20	0.04	0.11	0.18
Norway	High	0.28	0.14	0.05	0.24	0.12	0.08	0.10	0.15	0.12	0.14	0.28	0.33
	Medium	0.41	0.16	0.08	0.17	0.08	0.02	0.13	0.20	0.21	0.10	0.20	0.21
	Low	0.41	0.16	0.03	0.11	0.06	0.05	0.15	0.28	0.19	0.08	0.11	0.20
Poland	High			0.30			0.46			0.05			0.05
	Medium			0.50			0.27			0.03			0.04
	Low			0.61			0.18			0.04			0.02
Romania	High	0.22	0.28	0.28	0.57	0.54	0.41	0.02	0.03	0.04	0.07	0.01	0.09
	Medium	0.53	0.55	0.57	0.28	0.21	0.18	0.04	0.05	0.09	0.03	0.04	0.03
	Low	0.68	0.57	0.61	0.12	0.13	0.05	0.07	0.13	0.14	0.02	0.03	0.03
Russia	High	0.32	0.33	0.31	0.27	0.23	0.14	0.04	0.05	0.10	0.06	0.07	0.07
	Medium	0.42	0.42	0.40	0.14	0.13	0.06	0.08	0.08	0.11	0.06	0.04	0.05
	Low	0.43	0.30	0.36	0.10	0.15	0.03	0.17	0.03	0.22	0.06	0.03	0.00
Spain	High	0.24	0.14	0.05	0.56	0.52	0.47	0.03	0.03	0.03	0.08	0.09	0.12
	Medium	0.36	0.37	0.21	0.42	0.40	0.47	0.05	0.03	0.05	0.03	0.05	0.07
	Low	0.45	0.52	0.32	0.43	0.31	0.35	0.03	0.04	0.05	0.02	0.03	0.05
UK	High	0.43	0.23	0.07	0.22	0.16	0.13	0.04	0.09	0.10	0.06	0.15	0.25
	Medium	0.53	0.34	0.11	0.19	0.11	0.08	0.02	0.07	0.12	0.05	0.11	0.21
	Low	0.51	0.31	0.07	0.12	0.07	0.05	0.03	0.08	0.11	0.08	0.11	0.07
USA	High	0.31	0.23	0.12	0.19	0.25	0.23	0.06	0.07	0.08	0.10	0.13	0.19
	Medium	0.41	0.33	0.14	0.10	0.09	0.09	0.05	0.10	0.11	0.09	0.10	0.14
	Low	0.34	0.25	0.17	0.06	0.05	0.05	0.08	0.11	0.12	0.04	0.07	0.08

**Note:** Bold figures indicate differences between educational levels that are significant at the .05 level (two-tailed *t*-test). Black indicates a positive educational gradient; light gray indicates a negative educational gradient; dark gray indicates a U-shaped educational gradient; and white indicates no gradient.

**Table 2b. The Predicted Probability of Women Aged 15–45 Being in Each Class by Country, Cohort, and Educational Level, Classes 5–8**

		Class 5			Class 6			Class 7			Class 8		
		Delayed or no union formation			Marital dissolution, limited repartnering			Union dissolution, some repartnering			Cohabitation		
		1945–54	1955–64	1965–74	1945–54	1955–64	1965–74	1945–54	1955–64	1965–74	1945–54	1955–64	1965–74
Austria	High		0.16	0.12		0.00	0.01		0.04	0.07		0.08	0.17
	Medium		0.09	<b>0.09</b>		0.06	0.04		0.06	0.10		0.06	<b>0.15</b>
	Low		0.06	<b>0.04</b>		0.06	0.06		0.10	0.11		0.06	<b>0.10</b>
Belgium	High	0.09	0.14	0.14	<b>0.02</b>	0.01	0.01	0.02	0.08	0.09	<b>0.02</b>	0.05	0.15
	Medium	0.08	0.09	0.13	<b>0.24</b>	0.01	0.01	0.03	0.07	0.11	<b>0.00</b>	0.04	0.10
	Low	0.11	<b>0.19</b>	0.17	<b>0.02</b>	0.01	0.01	0.01	0.07	0.07	0.02	0.04	0.10
Bulgaria	High	0.07	<b>0.03</b>	0.04	<b>0.02</b>	0.05	0.05	0.02	0.03	0.02	0.01	0.01	0.03
	Medium	0.03	0.24	0.02	0.05	0.06	0.05	0.01	0.02	0.03	0.01	0.01	0.05
	Low	0.01	<b>0.02</b>	0.01	0.06	0.04	0.03	0.01	0.03	<b>0.06</b>	0.02	<b>0.07</b>	<b>0.15</b>
Estonia	High	0.05	0.05	0.07	0.12	0.13	0.06	0.05	0.06	0.10	0.02	0.05	0.22
	Medium	<b>0.03</b>	0.03	0.03	0.15	0.15	<b>0.09</b>	0.07	0.12	0.12	0.03	0.11	0.26
	Low	<b>0.01</b>	0.02	0.01	0.17	0.16	<b>0.01</b>	0.08	<b>0.18</b>	<b>0.19</b>	<b>0.11</b>	<b>0.18</b>	0.31
France	High	0.12	0.14	0.09	0.08	<b>0.03</b>	0.00	0.03	0.06	0.06	<b>0.07</b>	0.13	0.25
	Medium	0.08	0.09	0.08	0.09	0.08	0.01	0.03	0.05	0.08	<b>0.03</b>	0.11	0.23
	Low	0.08	0.09	0.13	0.09	0.10	<b>0.05</b>	0.03	0.05	0.08	0.02	0.08	0.24
Italy	High	<b>0.09</b>	<b>0.20</b>	<b>0.22</b>	0.01	0.00	0.00	<b>0.02</b>	<b>0.02</b>	<b>0.03</b>	<b>0.01</b>	0.01	<b>0.03</b>
	Medium	<b>0.06</b>	<b>0.07</b>	<b>0.10</b>	0.01	0.01	0.00	<b>0.00</b>	<b>0.01</b>	<b>0.01</b>	<b>0.00</b>	0.01	0.26
	Low	<b>0.02</b>	<b>0.04</b>	<b>0.06</b>	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.01	<b>0.02</b>
Lithuania	High	0.07	0.10	0.03	0.14	0.20	0.16	0.02	0.01	0.07	0.02	<b>0.00</b>	0.03
	Medium	0.05	0.04	<b>0.03</b>	0.14	<b>0.23</b>	0.18	0.04	0.04	0.06	0.01	0.01	0.03
	Low	0.04	0.04	<b>0.00</b>	0.16	<b>0.17</b>	<b>0.29</b>	0.01	<b>0.17</b>	<b>0.19</b>	0.03	<b>0.00</b>	<b>0.10</b>

NL	High	0.04	<b>0.11</b>	<b>0.10</b>	0.05	0.03	0.02	<b>0.06</b>	0.06	0.04	<b>0.04</b>	<b>0.10</b>	0.23
	Medium	<b>0.04</b>	<b>0.04</b>	<b>0.05</b>	0.07	0.05	0.02	<b>0.03</b>	0.05	0.05	<b>0.01</b>	<b>0.04</b>	0.20
	Low	<b>0.01</b>	0.02	0.04	0.09	0.06	0.02	0.03	0.06	<b>0.10</b>	0.01	0.05	0.16
Norway	High	0.10	0.08	0.11	0.05	0.05	0.02	0.06	0.08	0.09	0.03	0.10	0.19
	Medium	0.08	0.11	0.09	0.06	0.05	0.01	0.04	0.08	0.14	<b>0.01</b>	0.12	0.25
	Low	0.08	0.10	0.11	0.09	0.06	0.02	0.05	0.11	0.12	<b>0.03</b>	0.12	0.28
Poland	High			<b>0.06</b>				<b>0.04</b>		0.01			0.02
	Medium			<b>0.02</b>				0.08		0.03			0.03
	Low			0.02				0.06		0.04			0.03
Romania	High	<b>0.05</b>	0.04	<b>0.07</b>	0.08	0.09	0.06	0.00	<b>0.01</b>	0.03	0.00	<b>0.00</b>	0.01
	Medium	<b>0.01</b>	0.02	<b>0.03</b>	0.09	0.08	0.06	0.01	0.03	0.02	0.01	0.01	0.02
	Low	0.01	0.01	0.01	0.05	0.07	0.03	0.01	0.01	0.04	0.03	0.05	<b>0.08</b>
Russia	High	0.09	0.04	0.04	0.13	0.19	0.11	0.08	0.07	0.13	0.02	0.03	0.10
	Medium	0.04	<b>0.04</b>	<b>0.03</b>	<b>0.15</b>	0.17	0.14	0.07	0.06	0.12	<b>0.04</b>	0.04	0.08
	Low	0.06	<b>0.00</b>	<b>0.00</b>	<b>0.08</b>	<b>0.24</b>	0.11	0.06	<b>0.12</b>	0.17	<b>0.00</b>	<b>0.12</b>	0.11
Spain	High	0.05	<b>0.13</b>	<b>0.22</b>	0.03	0.04	0.02	0.01	0.02	0.01	0.01	0.02	0.07
	Medium	0.09	<b>0.07</b>	<b>0.10</b>	0.05	0.05	0.04	0.01	0.02	0.02	0.01	0.03	0.06
	Low	0.03	0.04	0.07	0.02	0.05	0.05	0.00	0.01	0.02	0.01	0.01	0.08
UK	High	0.09	0.12	0.14	0.11	0.13	0.06	0.04	0.08	0.10	0.01	0.03	0.16
	Medium	0.05	0.14	0.12	0.14	0.17	0.07	0.02	0.03	0.11	0.00	0.04	0.17
	Low	0.07	0.12	<b>0.27</b>	0.16	0.19	0.05	0.01	<b>0.08</b>	<b>0.18</b>	0.01	0.04	0.20
USA	High	<b>0.07</b>	<b>0.05</b>	0.09	0.14	<b>0.11</b>	0.09	0.12	<b>0.12</b>	<b>0.16</b>	0.02	<b>0.03</b>	<b>0.05</b>
	Medium	<b>0.03</b>	0.03	0.08	0.19	<b>0.19</b>	0.11	0.09	0.17	0.24	0.04	0.06	0.11
	Low	0.05	<b>0.05</b>	0.06	0.18	<b>0.13</b>	0.11	<b>0.16</b>	<b>0.23</b>	0.23	<b>0.08</b>	<b>0.11</b>	<b>0.18</b>

**Note:** Bold figures indicate differences between educational levels that are significant at the .05 level (two-tailed *t*-test). Black indicates a positive educational gradient; light gray indicates a negative educational gradient; dark gray indicates a U-shaped educational gradient; and white indicates no gradient.

is becoming increasingly popular for all groups, it is becoming even more so for the highly educated. Thus, education consistently shapes the educational gradient of the timing of marriage, regardless of whether it was preceded by cohabitation.

*The separation and cohabitation classes show an inconsistent educational gradient across countries.* Table 2b presents the association between education and partnership patterns that are not centered on long-term stable marriage (classes 5–8). The results for these classes are much more mixed, with inconsistent relationships and very few common patterns across countries. Class 5, which represents delayed partnership formation and remaining never partnered until age 45, has a mix of positive and negative gradients. Italy and Spain stand out as having a high probability of falling into class 5 and strong positive educational gradients, due to general delayed union formation and marriage (Castro-Martin, Domínguez-Folgueras, and Martín-García 2008). The positive educational gradient has emerged more recently in Austria, Lithuania, the Netherlands, Poland, Romania, Russia, and Spain. Cohorts in some countries, however, have no educational gradient or a U-shaped gradient, as in Bulgaria and the United States. In the UK, the least educated in the youngest cohort have a particularly high probability of falling into class 5, perhaps because of the low rates of forming co-residential unions.

Results for the separation classes (classes 6 and 7) are also mixed. In most countries, if the gradient is significant it is usually negative, with the exception of Estonia. Lithuania and Russia have positive gradients for earlier cohorts, but they too have negative gradients for later cohorts. Italy has a consistently positive educational gradient for class 7, which corroborates previous evidence that the emergence of divorce in Italy has been associated with higher education, although note that the predicted probability for this class is very small. The class representing cohabitation (class 8) also has inconsistent educational gradients. Belgium, France, Italy, the Netherlands, and Russia had positive gradients in the earliest birth cohorts, supporting studies that long-term cohabitation emerged among the most highly educated, especially in the Low Countries and France. However, only Austria has a positive educational gradient for the youngest cohort. In Bulgaria, Lithuania, Romania, and the United States, the educational gradient for the most recent cohort is negative. Note that the educational gradient for long-term cohabitation is consistently negative in the United States, supporting other findings (Kennedy and Bumpass 2008).

### ***Divergence by Education for Marriage and Separation?***

Taken as a whole, table 2a indicates that women with lower education have a significantly higher probability of falling in the earlier marriage classes (classes 1 and 3), while highly educated women are more likely to be in later marriage classes (2 and 4). However, it is difficult to know from table 2a whether more or less educated women are more likely to enter and stay in stable marriages throughout the reproductive ages, as discussed in the theoretical framework. In addition, it is difficult to know from 2b whether women with higher education are

diverging from women with lower education with respect to separation after either cohabitation or marriage. In order to answer these questions, we also show table 3, which combines the results from classes 1–4 and classes 6–7 and specifically looks for differences between high and low education.

Table 3 shows that throughout much of Western and Northern Europe and the United States, the educational gradient for staying in marriage throughout the reproductive period is significantly positive, supporting the recent findings that marriage is now more likely for the highly educated. This is the case in the latest cohorts in France, Lithuania, Norway, the UK, and the United States. Nonetheless, there is no significant relationship between education and staying in marriage in Central and Eastern European countries. In some countries, such as Poland and Romania, the lack of relationship is probably due to a high probability of all women entering and staying in marriage, while in Russia, women are more likely to be in classes with union dissolution, and in Estonia, women are more likely to be in long-term cohabitation. On the other hand, in Southern Europe, the gradient for the marriage class tends to be negative, primarily because the most highly educated delay union formation until their late 30s and early 40s, as represented by class 5.

However, for the separation classes, when the educational gradient is significant, it is consistently negative: in the most recent cohorts in Austria, France, Lithuania, the Netherlands, Poland, Spain, and the United States, the lower educated have a significantly higher probability of falling into a marital dissolution or separation class than the higher educated. These results might suggest that the higher and lower educated have significantly different partnership trajectories. However, only France, Lithuania, and the United States show a positive gradient for the marriage classes and a negative gradient for the separation classes, indicating that the relationship is not uniform within countries. Hence, while the results for the United States, France, and Lithuania indicate that patterns of union formation and dissolution appear to be diverging by education, this trend does not seem to be occurring to the same degree in the other countries.

### ***Country Context and Individual's Education***

We then turn to our second research question, which uses ANOVA to assess the relative importance of micro-level education and macro-level country context for each latent class by cohort (table 4). Each analysis presents the relative share of the variation in the predicted probabilities for that class explained by education and country, as well as the proportion remaining unexplained.

In the latent class for early, direct marriage (class 1), education was initially very important—it explained almost half of the variation in predicted probabilities for the 1945–54 cohort. In later cohorts, however, the relative importance of education declined to explain only about 10 percent of the variation in predicted probabilities. In contrast, cross-national variation increased in importance from explaining just under a quarter of the variation in the 1945–54 cohorts to nearly 80 percent in the 1965–74 cohorts. The percent of unexplained variance also declined across the cohorts, indicating that education and country context

**Table 3. The Combined Predicted Probability of Women Aged 15–45 Being in Classes 1–4 and 6–7, by Country, Cohort, and High versus Low Education**

		Classes 1–4			Classes 6 and 7		
		Marriage, with and without premarital cohabitation and infrequent separation before 45			Union dissolution followed by some repartnering into cohabitation or marriage		
		1945–54	1955–64	1965–74	1945–54	1955–64	1965–74
Austria	High		0.72	0.63		<b>0.04</b>	<b>0.09</b>
	Low		0.71	0.70		<b>0.16</b>	<b>0.17</b>
Belgium	High	0.85	0.72	0.61	0.04	0.09	0.10
	Low	0.83	0.69	0.64	0.03	0.08	0.09
Bulgaria	High	0.90	<b>0.88</b>	<b>0.86</b>	<b>0.03</b>	0.08	0.06
	Low	0.89	<b>0.83</b>	<b>0.75</b>	<b>0.08</b>	0.07	0.09
Estonia	High	<b>0.76</b>	<b>0.72</b>	0.55	<b>0.17</b>	<b>0.19</b>	0.16
	Low	<b>0.64</b>	<b>0.46</b>	0.47	<b>0.24</b>	<b>0.34</b>	0.21
France	High	<b>0.70</b>	0.63	<b>0.60</b>	0.11	<b>0.10</b>	<b>0.06</b>
	Low	<b>0.79</b>	0.68	<b>0.50</b>	0.11	<b>0.15</b>	<b>0.13</b>
Lithuania	High	0.76	<b>0.69</b>	<b>0.71</b>	<b>0.15</b>	<b>0.22</b>	<b>0.23</b>
	Low	0.75	<b>0.63</b>	<b>0.42</b>	<b>0.18</b>	<b>0.33</b>	<b>0.48</b>
Italy	High	<b>0.87</b>	0.77	<b>0.73</b>	0.03	0.02	0.03
	Low	<b>0.97</b>	0.94	<b>0.91</b>	0.00	0.01	0.02
NL	High	<b>0.81</b>	<b>0.70</b>	0.62	0.11	0.10	<b>0.06</b>
	Low	<b>0.86</b>	<b>0.81</b>	0.68	0.12	0.12	<b>0.12</b>
Norway	High	0.76	<b>0.69</b>	<b>0.59</b>	0.11	<b>0.13</b>	0.11
	Low	0.75	<b>0.61</b>	<b>0.48</b>	0.14	<b>0.17</b>	0.13
Poland	High			0.86			<b>0.05</b>
	Low			0.84			<b>0.10</b>
Romania	High	0.87	0.86	0.83	0.08	0.10	0.09
	Low	0.89	0.86	0.83	0.07	0.08	0.07
Russia	High	0.69	<b>0.68</b>	0.62	0.21	0.25	0.23
	Low	0.76	<b>0.52</b>	0.61	0.14	0.36	0.28
Spain	High	<b>0.90</b>	<b>0.78</b>	<b>0.68</b>	0.04	0.06	<b>0.03</b>
	Low	<b>0.94</b>	<b>0.89</b>	<b>0.77</b>	0.03	0.06	<b>0.08</b>
UK	High	0.74	0.63	<b>0.54</b>	0.15	0.21	0.16
	Low	0.75	0.57	<b>0.30</b>	0.18	0.27	0.23
USA	High	<b>0.65</b>	<b>0.68</b>	<b>0.61</b>	<b>0.26</b>	<b>0.23</b>	<b>0.25</b>
	Low	<b>0.53</b>	<b>0.48</b>	<b>0.42</b>	<b>0.34</b>	<b>0.36</b>	<b>0.34</b>

**Note:** Bold figures indicate differences between educational levels that are significant at the .05 level (two-tailed *t*-test). Black indicates a positive educational gradient; gray indicates a negative educational gradient; and white indicates no significant gradient.

**Table 4. Results from ANOVA of Education, Country, and Unexplained Variance, by Cohort (logit link)**

		Education	Country	Residual
Class 1: Early, direct, and stable marriage	1945–54	0.48	0.25	0.27
	1955–64	0.29	0.47	0.23
	1965–74	0.11	0.78	0.11
Class 2: Later, direct, and stable marriage	1945–54	0.28	0.64	0.08
	1955–64	0.19	0.74	0.07
	1965–74	0.08	0.88	0.05
Class 3: Early marriage preceded by cohabitation	1945–54	0.06	0.83	0.11
	1955–64	0.05	0.88	0.07
	1965–74	0.09	0.82	0.09
Class 4: Postponed marriage, preceded by cohabitation	1945–54	0.20	0.69	0.11
	1955–64	0.17	0.73	0.10
	1965–74	0.12	0.83	0.05
Class 5: Late union formation/Never partnering	1945–54	0.22	0.57	0.21
	1955–64	0.17	0.63	0.20
	1965–74	0.16	0.66	0.18
Class 6: Marital dissolution, limited repartnering	1945–54	0.02	0.96	0.03
	1955–64	0.02	0.96	0.02
	1965–74	0.02	0.95	0.03
Class 7: Varied dissolving union types	1945–54	0.01	0.93	0.06
	1955–64	0.02	0.93	0.06
	1965–74	0.02	0.94	0.04
Class 8: Cohabitation	1945–54	0.05	0.64	0.31
	1955–64	0.04	0.79	0.18
	1965–74	0.02	0.89	0.09

began to explain a greater proportion of the variance over time. Although our tests cannot show whether the change across cohorts is significant, the magnitude of the difference suggests that in the earliest birth cohorts, education was a more dominant factor than country context. Then, as countries started to experience increases in educational attainment and delays in marriage at different rates, country setting became more important.

The pattern is similar in the later direct marriage class (class 2), except that the role of education was less pronounced over the three cohorts and cross-national variation was always dominant. In class 3, the class representing early marriage preceded by cohabitation, country was the dominant factor for all cohorts. However, in this class, the role of education was minimal: education explained less than 8 percent of the variation in all cohorts and between 9 and

11 percent of the variance was left unexplained. In contrast, educational attainment explained a greater proportion of the variance in class 4, which represents postponed marriage preceded by cohabitation. However, the proportion explained by education declined, and as in the other classes, country became increasingly important. Again, education and country explained nearly all of the variation, with only 5 percent left unexplained for the latest cohort.

In class 5, representing late union formation and never partnering, education initially accounted for roughly one-quarter of the total variation in predicted probabilities. Thereafter, the relative importance of education declined, while the proportion of variance explained by country increased. Note that the proportion of variance explained by education in the 1965–74 birth cohorts was higher in class 5 than in any other class. Therefore, although the relative importance of education compared to national setting declined (as for classes 1, 2, and 4), education was still relatively important for delayed union formation. Also, this class had a high proportion of unexplained variance, suggesting that factors other than country and education were important.

For classes 6 and 7, which characterize union dissolution patterns, education is of limited importance in all cohorts, accounting for less than 2 percent of variance. This supports the above finding that marital dissolution and separation patterns are less likely to be associated with educational attainment, and that country context is far more important for explaining separation. Note as well that country context is so important for predicting marital dissolution or separation patterns that the proportion of unexplained variance is strikingly low—less than 6 percent for both classes. In class 8 (long-term cohabitation), education is only marginally important, accounting for less than 5 percent of variation in the predicted probability. In contrast, the proportion of variance explained by country increased by roughly 20 percentage points over the cohorts. While unexplained variance was relatively high in the earlier cohorts, less than 10 percent of variation was unexplained for the 1965–74 cohort. These results indicate that educational level is only marginally influential in explaining long-term cohabiting behavior, but country setting is becoming increasingly important.

## Discussion

Recent studies in the United States and Europe have argued that the more highly educated are increasingly following a trajectory characterized by delayed but stable marriage, while the least educated are following a trajectory including cohabitation and union instability (Isen and Stevenson 2010; Cherlin 2009; Martin 2006; Perelli-Harris et al. 2010; McLanahan 2004). No study, however, has examined this argument with holistic partnership trajectories between ages 15 and 45 using cohabitation and marriage histories. Our approach allows us to examine the complexity of relationship transitions across the lifecourse by simultaneously investigating the timing and type of partnership formation, as well as union dissolution and repartnering (see Perelli-Harris and Lyons-Amos 2015). Given that partnership transitions are often interdependent, tracing partnership status throughout adulthood allows us to better understand how education is



related to a range of processes rather than just a single event. The results from our first analyses provide some support for the diverging trajectories argument: higher education is important for understanding the timing and prevalence of stable marriage patterns in the majority of our studied countries, and in some countries partnership patterns with union dissolution were associated with lower education. However, the results from the second analysis reveal that a woman's education is less relevant for predicting partnership patterns than the country in which she is living, which suggests that context may be more important than individual-level characteristics.

Previous studies have indicated that union formation behaviors have been diverging across Europe and the United States (Billari and Liefbroer 2010), suggesting that social and cultural change has been occurring at different rates and producing diverse patterns of union formation. Here, we find that macro-level country context explains more of the variance in predicted probabilities than individual-level education and is an excellent predictor of partnership patterns as a whole. While education may be important for understanding the timing of marriage or the delay of union formation at the individual level, it is not the main predictor of partnership patterns in any latent class except the early marriage class. In fact, the importance of country context appears to be increasing over time, suggesting a growing influence of social, cultural, and economic factors on women's partnership behavior. This increasing divergence is occurring despite the expansion of educational attainment in all countries, an expansion that produces greater within-country heterogeneity and should provide a greater opportunity for education to become more influential as lower education becomes more selective of certain groups. Thus, our findings show that even though women's education has increased everywhere and should be producing greater differentials in partnership behavior, country of residence has become more important for characterizing partnership behavior.

Note, however, that it is impossible to completely disentangle the effect of education on the individual level from macro-level country context; country context does reflect the aggregate level of education in a country. The increase in education at the macro level may be driving social and cultural change and producing differences in partnership formation across countries. For example, the greater percent of women who attained higher education in the Scandinavian countries may be leading to a faster pace of delayed marriage and increased cohabitation than in Eastern European countries, where higher education has not expanded as quickly. Nonetheless, our results indicate that the within-country variation in education is less important for partnership patterns than the between-country variation of country context as a whole. For example, the findings suggest that the partnership pattern of a highly educated Norwegian is more similar to that of a less educated Norwegian than a highly educated Romanian.

This is not say, however, that an individual's level of education is not important for understanding union formation, particularly the timing of marriage. Overall, the two early marriage classes were dominated by negative educational gradients, while the two later marriage classes were dominated by positive gradients, suggesting that highly educated women are more likely to delay

marriage in pursuit of other opportunities, such as a career, or may be able to prolong the spousal search process due to their higher economic potential (Oppenheimer 1997). In addition, as higher education has expanded, the proportion of women in the early marriage classes has declined, with a greater proportion shifting to the later marriage classes, demonstrating how education has been important for delaying marriage. Cohabiting before marriage did not seem to change this relationship: latent classes with premarital cohabitation and early marriage usually had negative gradients, while those with premarital cohabitation and later marriage had positive gradients. Thus, premarital cohabitation is relatively inconsequential for understanding the educational gradient of partnership formation compared to the stronger and more consistent association between education and the timing of marriage.

In addition, education does seem to be associated with patterns of marital stability and union dissolution in some countries, particularly for more recent cohorts. The United States stands out as having a clear long-term divergence in union formation patterns by education; the stable marriage classes have positive educational gradients for all cohorts, while the union dissolution classes have negative educational gradients for all cohorts. The long-term cohabitation class is also characterized by a persistent negative educational gradient. However, the evidence for a divergence in partnership trajectories in Europe is comparatively weak. While in most of Northern and Western Europe, women with higher education have a higher probability of experiencing stable marriage, this association has only recently emerged and is not always consistent. Countries in Central and Eastern Europe tend to have no significant relationship between education and stable marriage classes, most likely because marriage is relatively young and universal, especially in Russia, Poland, and Romania (Hoem et al. 2010). In Italy and Spain, however, the stable marriage classes have a negative educational gradient, due to highly educated women having a higher probability of falling into the delayed partnership class. The educational gradient for the union dissolution classes is either negative or insignificant and has been for all cohorts. These results suggest that when looking at union trajectories as a whole, the educational gradient of union dissolution has not reversed over time, contradicting studies that examine only the transition to divorce (Härkönen and Dronkers 2006; Matysiak, Styrac, and Vignoli 2013).

Note that this study has several limitations. The reporting of cohabiting relationships may be subject to recall error, and each survey is subject to limitations that may bias results (see Perelli-Harris, Kreyenfeld, and Kubisch 2010). The number and form of the latent classes are sensitive to the specific countries and cohorts included, and the US 1951–54 cohort is not directly comparable to the 1945–54 cohorts in other countries. Due to truncation, the 1965–74 cohort would not have reached age 45, depending on the year of the survey in each country. This will have reduced the exposure time for these women, possibly underestimating their prevalence in the union dissolution classes, or even delayed marriage classes, and it could also have implications for the educational gradient. These issues were discussed extensively and tested with sensitivity analyses in Perelli-Harris and Lyons-Amos (2015). Finally, the analyses are only

descriptive and cannot establish a causal relationship between education and partnership trajectories. Despite these shortcomings, however, we feel that the benefits of comparing latent classes across countries and examining the youngest cohort with the available data outweigh these limitations.

Indeed, by including the youngest cohorts, we can see how country context is becoming more relevant across cohorts, as shown in the second analysis. Relative to individual-level education, country increasingly explains more of the variance in partnership classes over time, or at least does not change substantially. Thus, the increasing variation between countries has become more important for understanding holistic patterns of union formation and dissolution. However, the reason for the divergence in partnership behavior may be because some countries are at the forefront of new developments, while others are lagging behind (Billari and Liefbroer 2010; Lesthaeghe 2010). As cohabitation and union dissolution increase in all countries, Europe and the United States may eventually experience greater convergence. On the other hand, with the increasing de-standardization of the lifecourse, convergence may become less likely, as each country takes its own unique path. Indeed, qualitative research has suggested that participants in countries across Europe interpret the meaning of cohabitation in different ways (Perelli-Harris et al. 2014). Thus, in order to better understand these developments, it is important not only to search for common explanations for changes in partnership, but also to examine context-specific factors. Only in-depth investigation into historical, cultural, economic, and policy developments will lead to a better understanding of how and why partnership patterns are changing.

## Notes

1. Sequence analysis extracts partnership histories in a similar way but requires assumptions about missing data and may produce clusters not supported by the data.
2. Although person-months may be more accurate, computational limitations require the use of yearly intervals. However, robustness tests in individual countries produced similar results.
3. Women are considered single at time of separation, not divorce. Widows were coded as single after being in a previous union.
4. Other specifications of the underlying distribution did not substantially alter the results.
5. Growth mixture models with random coefficients did not converge with our data.
6. Although the bootstrap likelihood ratio test is better for testing the number of classes due to a lower false positive rate (Nylund, Asparouhov, and Muthén 1997), the test is too computationally intense.
7. The number of classes is sensitive to model specification; for example, the number of countries can change the number of classes. Hence, the eight latent classes are specific to this model specification, and we urge caution in interpreting this exact number (Warren et al. 2014).
8. We tried adding a trajectory for second- and higher-order unions, but only three classes emerged, indicating a loss of diversity. Therefore, we specified that respondents reenter cohabitation or marriage after separation.

9. We would prefer to estimate the model based on the pseudo-class method using Mplus (Wang, Brown, and Bandeen-Roche 2005; Nylund, Asparouhov, and Muthén 2007), but this approach was too computationally intensive.
10. We tested ANOVA results with both logit and square-root arcsine links, but due to similar results, we only present logit links.

## About the Authors

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