Educational Homogamy in Ireland and the UK: Trends and Patterns*

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Abstract

This paper examines the pattern of educational homogamy in Ireland and the UK. Using contemporary data on recent marriages from the early 1970s through to the mid 1990s, we show that these two countries share a broadly similar pattern of educational homogamy, which is quasi-symmetric in character, with no hypergamy over and above that which can be attributed to the marginals. In the 1970s, the strength of homogamy is much weaker in Ireland than in the UK. And we discern a clear inter-country difference in how the net strength of homogamy has changed over time. While it has declined in the UK since the 1970s, in Ireland the strength of homogamy has first increased and then levelled off. Our findings are inconsistent with the inverted U-shaped relationship between economic development and homogamy reported by Smits, Ultee and Lammers (1998) — an argument premised on secular change in the criteria of spouse selection. Instead, our results are better understood in terms of Mare's (1991) life course argument that homogamy is inversely related to the time-gap between school departure and first marriage.

1 Educational homogamy and social stratification

Educational qualifications are a key determinant of life chances in industrial societies. They are also a strong correlate of lifestyle and cultural tastes. Furthermore, schools and universities provide a context in which young people meet each other. For these reasons, education has always been important in mate choice. Specifically, there is a strong tendency for educational homogamy, *i.e.* for people with the same or similar educational qualifications to marry each other.[1]

But the pattern and the degree of educational homogamy might be changing. First, there has been substantial educational expansion in western societies over the twentieth century, and in particular over the last twenty five years. Secondly, the gender gap in educational attainment has drastically narrowed or, in some cases, even disappeared. This changes the opportunity structure of the marriage market. For example, while women tended to marry better qualified men in the past, the narrowing of the gender gap would limit the opportunity for women to marry up.

Thirdly, recent changes in women's role in the labour market and the family might also affect mate choice. If married women now expect, and are expected, to work in the labour market and contribute to the family income, other things being equal, women with high earning potential (for which education is a good predictor) would become more desirable as marriage partners. Highly qualified men would be in a stronger position to attract highly qualified women. While men with less qualifications might also want to attract highly qualified women, they would have to settle for a less qualified match. Such processes might lead to a greater degree of educational homogamy.

Fourthly, as Mare (1991) demonstrates, life course pattern, especially the time-gap between leaving school and getting married, affects educational homogamy. Those who get married shortly after leaving school are more likely to marry a classmate, and

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[1]In this paper, we also use the term educational homogamy in a more general sense to refer to the pattern of association between husbands' and wives' qualifications. We trust readers would be able to tell from the context which sense of the term we are using.

classmates tend to have the same qualifications.[2] In most industrial societies, the mean school leaving age has been rising over the post-war period, while the mean age of first marriage has first fallen and then risen sharply (see Figure 2 below). This means that the time-gap between school and marriage has been narrowing up to the early to mid 1970s, and then the time-gap has stabilised or perhaps widened slightly. The corresponding effect of this would be a rise and then a fall in educational homogamy.

This paper takes two countries, Ireland and the UK,[3] which display both considerable cultural commonality and quite dramatic differences in their social structures, and examines the educational patterning of marriage from the early 1970s to the mid 1990s, using contemporary data on recent marriages.

2   Recent research and national contexts

A comparison of Ireland and the UK is useful because it allows us to compare and contrast two sets of arguments on educational homogamy. The first is the life course argument of Mare (1991), which we summarise above. Note that this argument is premised on the timing of two life course transitions (leaving school and getting married), and their trends over historical time. No matter what social, demographic, or technical factors, or public policies are behind these trends, the argument here is that these trends lead to variation in the time-gap between school departure and marriage, and the changing time-gap explains the trend in the strength of homogamy over time. We do not think that Mare's argument is incompatible with individual's preferences as explanation of educational homogamy. However, it should be clear that what does the explanatory work in his argument are demographic trends, and the opportunity structure of meeting potential spouses with various educational qualifications that the trends create.

In contrast, the second set of arguments put changing preferences or criteria in

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[2]This is especially true for spouses who met at the latter stages of their educational career, as the probability of them eventually getting different qualifications would be smaller.

[3]More precisely, the Republic of Ireland and Great Britain.

spouse selection in the foreground of its explanation. This comes from recent cross-national research on educational homogamy. Analyzing data from 65 countries, Smits et al. (1998) report an inverted U-shaped relationship between level of economic development and educational homogamy: as a country becomes economically more developed, educational homogamy first increases, then peaks and eventually declines. They believe this inverted U-curve is the composite result of two social forces which dominate at different phases of economic development. On the one hand, as the effect of education on future socioeconomic status increases, qualifications becomes progressively more important in mate choice. This means a positive relationship between economic development and educational homogamy. Smits *et al.* call this the *status attainment hypothesis*. However, after a certain level of economic development has been reached, Smits *et al.* argue, people would be able to afford the luxury of "romantic love", and the cold efficiency of life chance calculation that is associated with educational homogamy would become less important. They call this the *romantic love hypothesis*.

Smits *et al.* also report religious-cultural variation in educational homogamy, claiming that Catholic, Muslim and Confucian countries have higher levels of educational homogamy than Protestant countries. They attribute the higher level of educational homgamy among catholics to their cultural conservatism: because catholics tend to hold more traditional values over marriage and family issues, status consideration would be more important in mate choice.

Raymo and Xie (2000) point out that although Smits *et al.* are really interested in over time trend within country, because trend data is not available to them, Smits *et al.* have used cross-sectional data from countries at different levels of economic development. The implicit assumption is that the time path followed by today's industrializing countries is essentially the same as that taken by the industrialised countries in the past. Since this might not be a reasonable assumption, Raymo and Xie argue that the findings of Smits *et al.* need to be tested with true trend data. Having examined data from four countries (China, Japan, Taiwan and the United States) and two periods

(roughly the early 1970s and the mid 1980s), Raymo and Xie partially confirm the findings of Smits *et al.* : a clear trend towards less homogamy in all four countries,[4] but no evidence that the Confucian countries in their sample having a higher level of homogamy than their Protestant country (*i.e.* the United States).

We wish to test the claims of Smits *et al.* further in the same spirit as Raymo and Xie. We also wish to constrast the argument of Smits *et al.* with those of Mare (1991). As we shall show in section 2.5, these two perspectives lead to quite different predictions of the level of educational homogamy in the two countries and how they change over time. Let us first describe a few background features of Ireland and the UK that are relevant to the issue under consideration.

2.1 Religion and cultural values

Ireland and the UK have a shared history and a shared language, and are the only completely insular EU states. Many of the institutions of state, and to some extent the view of the rest of the world, are consequently similar. However, there are deep cultural differences, and the best part of a century of separate development has meant that institutions such as the education system bear incomplete resemblances.

To focus on the similarities and differences, we can characterise Britain as a relatively secular/protestant society with a very long history of urbanised industrialism. The Republic of Ireland, in contrast, is a late-industrialising society with a substantial rural sector, and has a high (though declining) level of religious participation which is very predominantly Catholic.[5] Britain, though formally a theocracy, has a strong tradition of liberal–secular politics and very low levels of active religiosity in the general

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[4]All but China can be considered as falling well over to the righthand side of inverted-U curve.

[5]Census figures for Ireland show the proportion Catholic at 93.9% in 1971, falling to 91.6% in 1991, with modest growth in the no-religion/no-religion-stated category (1.8% in 1971 and 4.2% in 1991). The bulk of non-Catholics are Protestant, predominantly Anglican. Corresponding figures on "estimated active faith membership" among adults in the UK show approximately 10 million in 1970, falling to 8.2 million in 1990, a fall from about 23% to 17% (UK Office of National Statistics, 2002, table 15.1). Similarly, Greeley (1999) quotes International Social Survey Program data that suggests a "weekly attendance" rate of 17% in Great Britain, compared with 71% among Catholics in the Republic of Ireland.

population, while Ireland, with formal separation of church and state, has a tradition of religious conservatism informing both politics and people such that the law has tended to embody a great deal of Catholic conservative values. Tellingly, for instance, the divorce rate in Britain is among the highest in Europe (Haskey, 1996), while in Ireland divorce became legal only in 1997.

2.2 The educational system

The overall structure of the educational system in both countries have not been dramatically different. One respect in which the common institutional history does make for similarities is in the university systems. The Irish system was established before independence and is modelled on the English system, and thus we can treat university education as meaning "the same thing" in both countries. The primary systems also have common roots in the nineteenth century, but Ireland's system has been from the beginning more clearly denominational and under effective church control.

There is a greater difference at the second level. In the UK, secondary education became free and universal with the 1944 Education Act. Under the provision of this Act, pupils were assigned to one of three types of secondary schools (grammar, technical, and secondary modern) according to the results of an exam which they took at the age of eleven. The "11-plus" exam was abolished in 1965, and the tripartite system was replaced by a single type, the comprehensive school. Along with these reforms, the minimum school-leaving age was raised to 15 in 1947, and then to 16 in 1973/4. In Ireland, free secondary education was not introduced until 1967. Thus before the 1960s the great majority of people in Ireland would have primary education only. Second level education in Ireland consists of two cycles. Pupils typically enter the junior cycle at the age of 12, and they take the Intermediate or Junior Certificate examinations at the age of 15 or 16. Some students would leave the educational system at this point, but those who go on to the senior cycle, which lasts two years, will take the Leaving Certificate examinations at the age 17 or 18. In short, the structure of the educational

system as well as the timing of the various transition points are broadly similar in the two countries.

Table 1: Trends of educational participation, UK and Ireland

(a) Educational participation rates by year of age, UK and Ireland, 1992

Country	17	18	19	20	21	22	23	24
Ireland	76.5	57.5	39.1	29.6	19.4	11.1	6.1	4.0
United Kingdom	56.7	33.6	23.9	19.5	13.7	8.1	5.2	3.7

Source: US National Center for Educational Statistics (1996), Table 6.

(b) Participation in education as a percentage of the population aged 5–29, OECD estimates

	All education except early years			
	1975	1985	1990	1994
Ireland	51.1	52.4	55.9	57.0
United Kingdom	n/a	52.2	49.8	50.5
	Tertiary education			
	1975	1985	1990	1994
Ireland	2.4	3.3	4.4	6.2
United Kingdom	2.5	2.9	3.4	5.3

Source: Centre for Educational Research and Innovation (1996), Table P1t.

Educational attainment has progressed rapidly in both countries. Using Irish census data we calculate that the proportion of the population having left school at age 17 or older has gone from, for males, 20.4% in 1971 to 38.9% in 1991, and for females from 26.6% to 45.9%. Using OECD data for 1992 (US National Center for Educational Statistics, 1996, Table 6), we see that Irish participation rates for 17 to 21 year-olds exceed UK rates substantially (see Table 1, panel A). Panel B of the same table looks at change in participation over time, and though it is very difficult to get long series of comparable data, it suggests that participation, both overall and in the tertiary sector, has grown more strongly in Ireland than in the UK.

2.3 Female labour force participation

Female labour force participation has grown substantially in both countries over the period considered, but from a far higher base in the UK. As readers can see from Figure 1, activity rates have been particularly low among married Irish women until relatively recently. Coleman (1992) quotes labour force participation rates for married

women in Ireland as 7.5% in 1971, rising to 23.1% in 1988. He quotes much higher rates in the UK, with for instance 63% of working-age women with dependent children in the labour market in 1989. Though this participation will in many cases be on a part-time basis, it is clear that the economic contribution of the wife is becoming much more important.
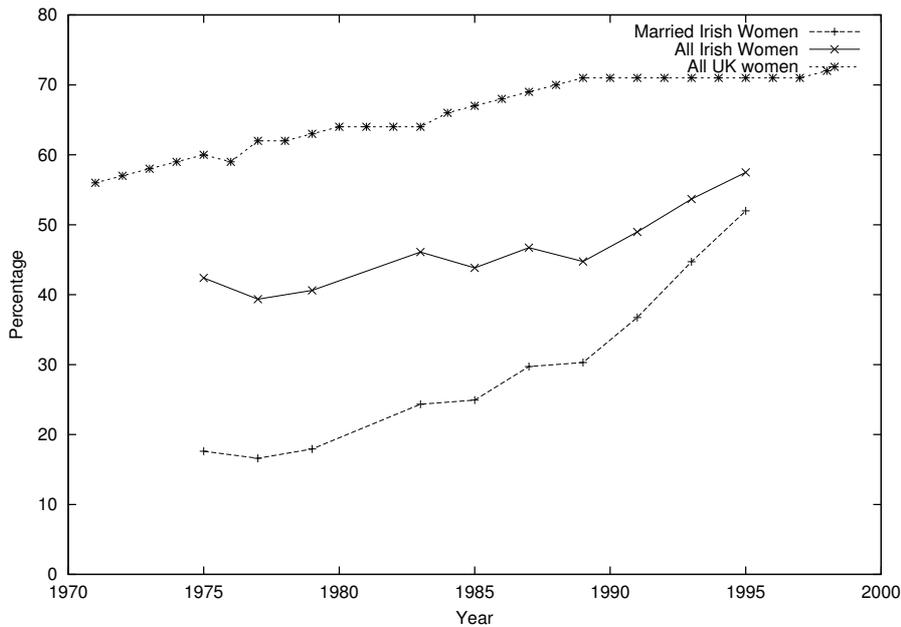

Figure 1: Female labour force participation rate, Ireland and UK. Source: Ireland—Labour Force Survey Reports, Central Statistics Office, UK—Labour Force Survey, Office for National Statistics.

2.4   Age of marriage

Similar to other industrial countries, we see in both countries a sharp decline in the age of first marriage after the second world war, which is followed by an equally sharp rise. But compared with the British, the Irish have always married late. In 1960, the mean age of marriage of Irish bachelors was almost 31, while that of UK bachelors was under 26 (see Figure 2). The corresponding figures for Irish and UK women were 27 and 23 respectively. Because, as noted above, free and universal secondary education was introduced to Ireland some two decades later than in the UK, the Irish had traditionally left school earlier. This means that the time-gap between leaving school and getting

married was traditionally much longer in Ireland. Another notable feature of Figure 2 is that the turn around in the trend occurred much earlier in the UK (late 1960s to early 1970s) compared with Ireland (late 1970s). This implies that the time gap between school departure and marriage had continued to narrow for almost a decade longer in Ireland.
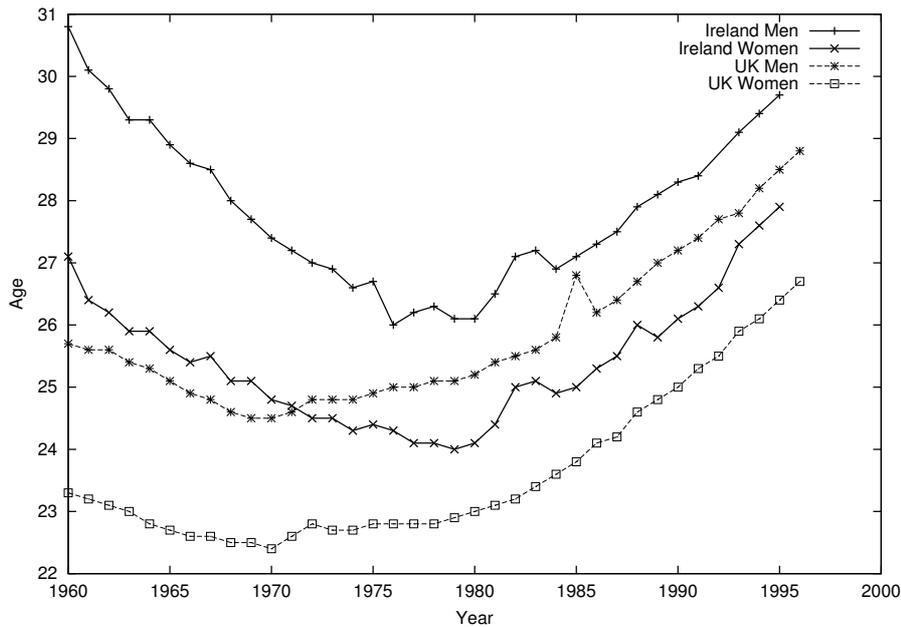

Figure 2: Mean age of first marriage by sex, Ireland and UK.
Source: Statistical Office of the European Union (1989), (1999)

2.5 Summary and expectation

How might Ireland and the UK differ in educational homogamy? Smits *et al.* and Mare give us contrasting predictions on both the initial difference in the level of educational homogamy in the 1970s (the first time point of our analysis), and the time path of change in the two countries.

The religious-cultural argument of Smits *et al.* suggests that Ireland should have a higher level of educational homogamy, because of the considerable influence still exerted by the Catholic church in Ireland. In terms of changes over time, the posited inverted U-curve implies that educational homogamy should decline for both Ireland

and the UK. This is because although Ireland is a late developer amongst industrial countries, it was already on the right-hand side of the inverted U-curve in the 1970s.[6] These predictions are captured schematically on the left-hand panel of Figure 3. Our reading of the theory is that it is agnostic on whether the two countries are converging or diverging over time in educational homogamy, at least in the limited time frame considered in this paper.

In contrast, Mare's argument leads us to expect Ireland to have a *lower* level of educational homogamy initially, because in the 1970s the time-gap between leaving school and first marriage was much wider in Ireland than in the UK. His argument also suggests quite different time paths of how educational homogamy would evolve in the two countries. Over the 1970s, the time-gap in Ireland was still narrowing, but it has already begun to widen in the UK, due to the rapid rise in age of first marriage. This implies that the level of educational homogamy in the UK has been declining since the 1970s. But in Ireland we should see an increase in educational homogamy during the 1970s, and then a decline afterwards. In other words, the decline in educational homogamy in Ireland should happen about a decade later than the UK. These predictions are depicted on the right-hand panel of Figure 3. Note that the key predictions here are the initial difference and the different shape of the time paths. These should lead to a narrowing in the difference in the level of educational homogamy between the two countries over time. But strictly speaking we are agnostic as to whether, and if so, when the two paths would cross each other.

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[6]Smits *et al.* use two indicators of economic development—(1) percentage of the labour force employed outside agriculture and (2) per capita energy consumption (in kilograms of coal equivalents). The figures they reported (1998:275) for Ireland as of 1979 are 69% and 2,164 kg respectively. These figures are quite different from those reported in one of the sources cited by Smits *et al.* Taylor and Jodice (1983) that in 1977, 79% of the Irish labour force was non-agricultural, and that per capita energy consumption reached 3,044 kg in 1975 (Taylor and Jodice 1983:115). Still, either set of figures would place Ireland quite comfortably on the right-hand side of the inverted U-curve (cf. Smits *et al.* 1998:281, Figure 3).
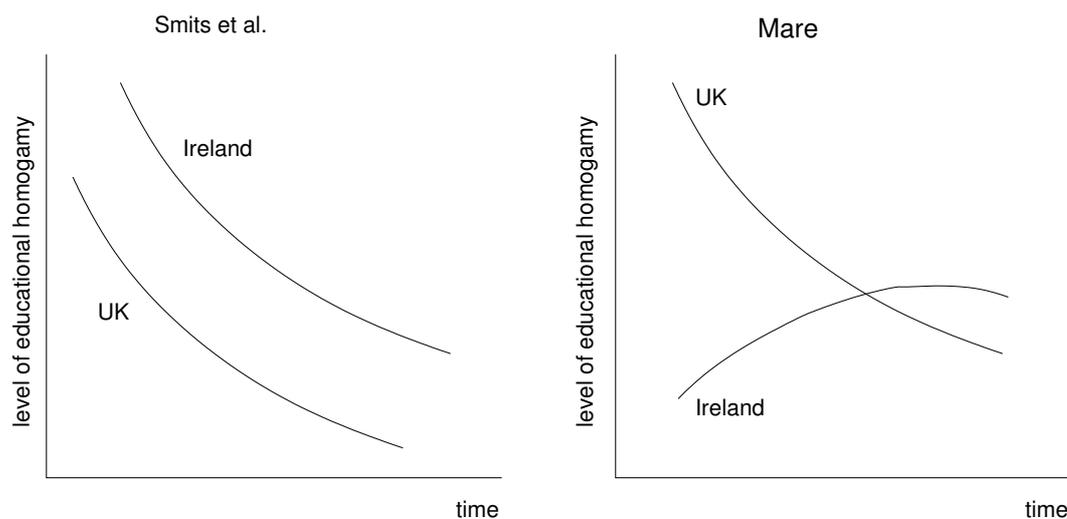
Figure 3: Two sets of predictions on how the level of educational homogamy in Ireland and the UK should change over time.

3 Data and method

In this paper we use loglinear models to analyze cross-classifications of husbands' and wives' education. Because we take our data from prevailing marriages, this approach is susceptible to a potential bias: that heterogamous and homogamous marriages are likely to have different breakup rates. To minimize the bias, we follow Mare (1991) in using contemporary data and restricting ourselves to recent marriages, defined as those formed within five years of the survey date.[7]

Opting to work on tables of recent marriages has important consequences for the analysis. On the one hand we ignore cohabitation, which has become particularly important in the UK. On the other, we ignore time, *i.e.* issues of timing or age of marriage, rates of partnering and the proportion remaining single, *etc*.

We choose to ignore cohabitation partly for data reasons: not all of the sources we use have sufficient data on the cohabitant partner or on cohabitation duration. However, we would not be happy to treat cohabitant partnerships simply as marriage by another

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[7]Mare has carried out two sets of analyses, using data on marriages formed within one year and five years of the survey date. Because our data sets are much smaller, we are restricted to using a five-year window only.

name, even if we had the data; there may well be different mechanisms in partner selection, and cohabitation certainly has different dissolution characteristics.

Given the importance of the growth of cohabitation, primarily in the UK but also more recently in Ireland, this is a restriction on the generality of this research, and the findings must be interpreted as relating to marriage in a period where the meaning of marriage is changing. To a certain degree it can be argued that marriage is more important and a more absorbing state than is cohabitation, and that cohabitation tends to be of short duration with high rates of dissolution and transition into marriage (Ermisch and Francesconi, 2000), and thus to exclude cohabitation may be no worse than to conflate the two states. However, as we argue in Chan and Halpin (2000), the fact of cohabitation, especially as a prelude to marriage, changes the characteristics of marriage. In particular, the event of marriage will happen later in the history of a partnership, so perhaps the time-gap is effectively biased down.[8]

To the extent that there are substantial shifts in the timing of partnership, there is an imperfect relationship between cohort and calendar time. Other approaches could take this into account, for instance by controlling for age group, and/or including non-married as a category in the table. We have opted not to do this for reasons of sample size, and to keep the modelling conceptually simpler.[9]

For the UK we use data from the General Household Survey (GHS) which has been running approximately annually since 1971. For Ireland we have to combine information from three separate surveys: the Irish Mobility Survey of 1973 (IMS), the Survey of Poverty, Income Distribution and Usage of State Services (SPIDUSS) of 1987, and the Irish section of the European Community Household Panel (ECHP) from which we use data from 1994 and 1995. All but the IMS, whose sample is adult

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[8]We plan to address the question of whether the levels of 'educational homogamy' differ between cohabiting and married couples in the UK in another paper.

[9]An alternative approach which puts more emphasis on time, and uses covariates more efficiently, is to model the hazard of marriage, with spouse education as a set of competing-risk destinations, and own education as a covariate (*e.g.,* Chan and Halpin, 2000). Though useful, this approach has difficulties separating net tendencies towards homogamy from structural effects of educational distributions. The loglinear approach makes this distinction automatically, allowing more reliable comparison over time and across countries, though without individual-level covariates. No one approach is universal.

males, are household samples, and the IMS has detailed information on spouse. We choose the years 1973, 1986 and 1995 from the GHS to match the years available for Ireland.

3.1 Absolute or relative rates?

As noted above, we use loglinear models in our empirical analysis. As with loglinear analysis of occupational mobility tables, our main focus is on what could be called the relative rates of homogamy, as expressed in odds ratios. To put it differently, we shall focus on the association between husbands' and wives' qualifications, net of the confounding effects of the marginal distributions.

But why should the ideas of Mare or Smits *et al.* be tested at the relative rather than the absolute level? The time-gap argument suggests greater homogamy at shorter durations after leaving school, because the qualification homogeneity of one's social group will be higher. In one sense this is an argument about opportunity, *i.e.* you are more likely to marry homogamously because there are more potential spouses with similar levels of education. Is this therefore an argument for testing Mare's hypothesis at the absolute level? We think not: the time-gap has a relative effect, such that the homogeneity of one's social group is higher than an "average" given by the population distributions, and will decline over time towards that average. That is, at short durations you have an extra chance of marrying homogamously, *over and above* that given by the population distribution of available spouses, and thus modelling relative rates of homogamy is the appropriate method.

In contrast to the time-gap argument, which is really a structural argument, marriage market or cultural theories of homogamy implicitly involve preferences and competition. One is competing with one's cohort for the "best" spouse from the pool of available partners, and this process is inherently relative: your outcome depends on the distribution of your cohort, and your position in it, and that of the partner cohort. For a given configuration of social forces, different patterns of absolute homogamy

will emerge from different distributions, but for any set of distributions, stronger social forces will lead to more association between husbands' and wives' qualifications. Again, the focus on relative rates is appropriate to assess the strength of these preference/competition social forces.[10]

4 Modelling and results

We address four questions in the following analysis. (1) How do the educational distributions of recent spouses change in the two nations? (2) What is the general form of the association between wives' and husbands' qualifications? (3) Are there differences between countries in this association? (4) Are there changes over time, within countries, in this association? If so, what are the differences between countries in the evolution of the association over time?

Table 2: Educational distributions of "recent" spouses, by country, sex and survey years, column percentages

		Men			Women		
		1973	1986/7	1994/5	1973	1986/7	1994/5
Ireland	university	6.9	28.2	25.1	0.8	25.5	21.8
	2nd level	5.7	30.9	29.4	4.5	26.2	48.3
	part 2nd	41.6	32.2	31.8	33.1	40.3	16.6
	primary	45.7	8.7	13.7	61.6	8.1	13.3
	N	245	149	211	245	149	211
UK	university	11.2	25.9	19.4	8.4	12.0	23.0
	2nd level	15.8	15.2	40.3	5.3	15.7	18.0
	part 2nd	17.3	29.9	31.2	25.2	34.7	38.2
	primary	55.8	29.0	9.1	61.1	37.6	20.8
	N	678	683	427	678	683	427

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[10]For an useful review of the methodological and theoretical issues in the homogamy research, including the use of loglinear models and odds ratios, see Kalmijn (1998).

4.1 Changing educational distributions

We use a four-fold educational classification. The highest category is the third-level, consisting of university degrees and some sub-degree qualifications such as non-graduate teaching diplomas. The next category is complete second level education, that is, A-levels in the UK and Leaving Certificate in Ireland. Grouped with these are some post-secondary qualifications that are not third level such as nursing qualifications. Incomplete second level is the third category, with UK O-levels/GCSEs and Irish Group, Junior or Intermediate Certificate examinations being the typical example. Where possible, apprenticeships are included in this category. The residual category consists of lesser qualifications, second level experience without achieving any qualifications, and for older sample members in earlier years, primary education only.

Table 2 presents the educational distributions of men and women by survey year and show that both countries have experienced a large increase in qualification level over time. In 1973, only one in eight of recent husbands in Ireland had complete secondary education or above, compared with about one in four in the UK. By 1995, 55% of Irish husbands had this level, compared with 60% of UK husbands.[11] At the other extreme, proportions with primary qualifications go from 46% and 66%, for Ireland and the UK respectively, to 14% and 9%.

The changes for women are more dramatic. In the Irish sample for 1973, only one in twenty wives had complete second level or greater, rising to 70% in 1995. In the UK the corresponding rates are 14% and 41%. Both countries show rates around 61% for primary qualifications in 1973, falling to 13% (Ireland) and 21% (UK) by 1995. This last difference may well be due to the availability of sub-GCSE vocational qualifications in the UK rather than a widespread failure to achieve any.

To summarise, in both countries there is a dramatic shift, particularly between 1973 and 1986/7. To some degree it is more dramatic in Ireland, where free secondary

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[11]Changes in proportions may reflect different marriage patterns as much as different age-related qualification distributions — thus the non-monotonic pattern in graduate husbands is likely due to a growing tendency to cohabit or postpone partnership.

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education was introduced in the late 1960s, two decades later than the UK. The transformation is especially dramatic for Irish women, reflecting a transition from a very traditional society to a rather more westernised one in the last thirty or forty years.

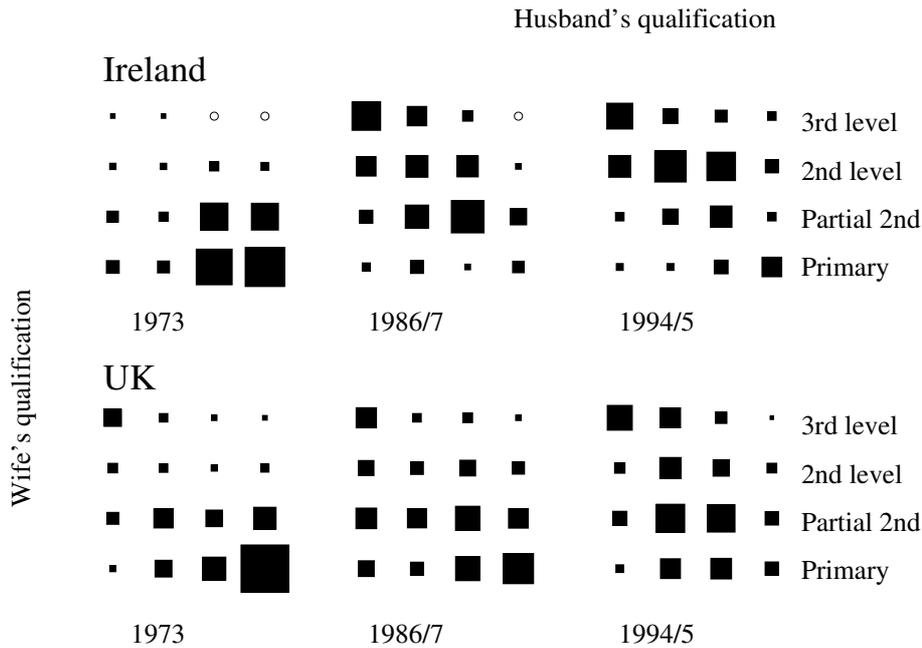## 4.2   The general pattern of association

Figure 4: Cross-classification visualised, Ireland and UK

We present the cross-classifications of husbands' and wives' education graphically in Figure 4. Within each country and year specific sub-panel the size of the squares is proportional to the observed cell counts.[12] By this means we immediately see that for both countries in 1973 the vast majority of couples both have partial second-level education or less. We can also see the dramatic changes by 1986/7, but also how 1994/5 is different. Comparing countries we can see that Ireland tends to have a more lumpy bivariate distribution, particularly in 1973, while Britain has a more even one. On the whole, Figure 4 suggests that the biggest differences are temporal, rather than cross-

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[12]More precisely, the area of each square is proportional to n_{ij}/N, where n_{ij} is the cell count, and $N = \sum_i \sum_j n_{ij}$ is the total number of observations for that sub-panel. Exact cell counts are available from the authors on request.

national. This is certainly true of the margins, but there may be systematic differences in the association between the two countries.

As a crude measure of educational homogamy, we note that 46.1% of the couples in the 1973 Irish sample were on the main diagonal of the table, compared with 49.0% and 49.3% for 1986/7 and 1994/5 respectively. The corresponding figures for the UK were 57.1%, 40.7% and 39.6%. Thus, measured in *absolute* terms, the level of educational homogamy has been remarkably stable in Ireland, while in the UK, it has declined quite sharply, such that although the UK level was 11% higher than the Irish level in 1973, it is now 10% below.[13]

As is well known, this absolute measure confounds the effects of the marginals with the underlying *relative* association between husbands' qualifications (H) and wives' qualifications (W). To study the *relative* association, we fit a set of loglinear models that explore the two-way $[WH]$ association, ignoring temporal change (Y), and initially ignoring inter-country difference (C) in this association. We begin with a baseline model of the pooled data, fitting all the three-way terms except those relating to the $[WH]$ association:

$$\text{conditional independence:} \quad [WYC][HYC] \tag{1}$$

There are various ways to model the $[WH]$ association, the least parsimonious of which is to add the $[WHYC]$ term, to give the saturated model. If we ignore year and country for the moment, we can fit the $[WH]$ term:

$$\text{common association:} \quad [WYC][HYC][WH] \tag{2}$$

Model 2 restricts the $[WH]$ association to be exactly the same for both countries and for all years. There are a variety of more parsimonious, and thus informative, ways

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[13]We see a similar picture if we use a more liberal definition of absolute educational homogamy: that of marrying someone not more than one educational level away. The figures for Ireland are: 90.2% (1973), 89.3% (1986/7) and 89.1% (1994/5), while those for the UK are: 88.5%, 77.9% and 82.4%.

of describing the $[WH]$ association, in the range between conditional independence (model 1) and common association (model 2). We consider three here, namely the distance model, the crossings model, and the quasi-symmetry model.

To elaborate, the distance model postulates that the difficulty of matching two persons n "steps" apart is the same, regardless of their *absolute* positions; it is the *relative* distance which counts. So, for example, under the distance model, net of the effect of the margins, the difficulty of marriage between categories 1 and 2 is the same as that between categories 2 and 3 (both being 1 "step" apart). Similarly, the difficulty of marriage between categories 1 and 3 is the same as that between categories 2 and 4 (both being 2 "steps" apart). However, the difficulty of marriage between categories 1 and 3 is not necessarily twice that between categories 1 and 2. Effectively, the association pattern is assumed to be banded along the minor diagonals and symmetric.[14] Panel (a) of Figure 5 shows the arrangement of the parameters, where a distinct parameter applies to cells of each colour.

The crossings model is parameterised in terms of barriers rather than distance. For n categories, there are $n-1$ barriers. For a distant match there are more barriers to cross than for a near one, but the barriers you have to cross now depend on your own category. That is, if W is at category 4 and H is at category 2, the two barriers crossed are $b_{4\to3}$ and $b_{3\to2}$, while a match between W_3 and H_1 crosses $b_{3\to2}$ and $b_{2\to1}$. The crossings model is fitted using a dummy variable for each barrier or crossing, which partitions the table into cells which involve crossing that barrier and cells which don't. Panel (b) of Figure 5 demonstrates this in the 4-category case.

The quasi-symmetry model postulates that, controlling for marginal distributions, the tendency for matches between W_i and H_j is equal to that for matches between W_j and H_i. That is, the association has a symmetrical pattern insofar as the margins allow (see panel (c) of Figure 5). The quasi-symmetry model is less restrictive (thus less parsimonious) than either of the foregoing, and they can be considered as constrained
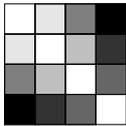
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[14]There is an additional assumption that difficulty rises with n, though this constraint is not imposed by the model.
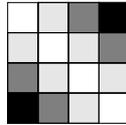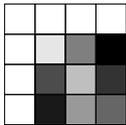
(a) the distance model
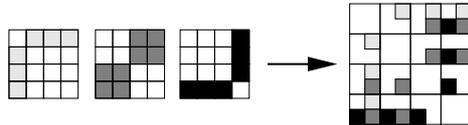
(b) the crossings model

(c) the quasi−symmetry model

(d) unconstrained association

Figure 5: Different ways of modelling association.

forms of it. We represent the three models as follows:

$$\text{distance:} \qquad [WYC][HYC][\delta] \qquad\qquad (3)$$

$$\text{crossings:} \qquad [WYC][HYC][\lambda] \qquad\qquad (4)$$

$$\text{quasi-symmetry:} \qquad [WYC][HYC][\sigma] \qquad\qquad (5)$$

where $\delta = |i - j|$ is a variable marking the absolute difference between W_i and H_j, λ represents the crossings parameters, and σ represents the symmetry parameters.

By way of comparison, panel (d) of Figure 5 shows the model of unconstrained association (*i.e.* model 2) in a typical parameterisation (with row 1 and column 1 being the reference categories). This can be considered as equivalent to the quasi-symmetry pattern with the parameters for the lower triangle no longer equal to those for the upper triangle.

Table 3: Modelling the general pattern of association

Model	G^2	df	model comparison	ΔG^2	Δdf	p
1 $[WCY][HCY]$	663.219	54				
2 $[WCY][HCY][WH]$	83.541	45				
3 $[WCY][HCY][\delta]$	116.101	51	3–1	547.119	3	0.00
4 $[WCY][HCY][\lambda]$	110.947	51	4–1	552.272	3	0.00
5 $[WCY][HCY][\sigma]$	85.980	48	5–3	30.121	3	0.00
			5–4	24.967	3	0.00
			5–2	2.439	3	0.49
5a $[WCY][HCY][\sigma][\pi]$	85.952	47	5a–5	0.028	1	0.87
6 $[WCY][HCY][\phi^c\,\sigma]$	85.915	47	6–5	0.066	1	0.80
7 $[WCY][HCY][\sigma\,C]$	74.181	42	7–5	11.799	6	0.07

δ indicates the distance parameters, λ the crossings parameters, σ the quasi-symmetry parameters, π is the hypergamy parameter, and ϕ^c the uniform difference parameter.

From Table 3, we see that the distance and the crossings models account for a large part of the overall $[WH]$ association. They are not nested, but have the same degrees of freedom. The quasi-symmetry model fits the data significantly better than both the

distance and the crossings models. Indeed, it fits better than the model with the full

$[WH]$ term. (For 3 degrees of freedom, model 2 reduces the deviance of model 5 by

2.4, which is not significant.) That quasi-symmetry fits better than the full association

model makes one wonder whether there is no tendency to women's hypergamy over

and above that arising from the different marginal distributions of education. We test

this in model 5a. As readers can see, the addition of the hypergamy parameter hardly

affects the G^2, suggesting that quasi-symmetry is a good description of the overall as-

sociation and that any absolute hypergamy is explained by differences in the marginal

distributions of education.

Table 4: Net association parameters—quasi-symmetry model

(a) Ireland & UK	university	2nd level	part 2nd	primary
university		-0.786**	-1.318**	-2.369**
2nd level			-0.194*	-1.022**
part 2nd				-0.431**
primary				
(b) Ireland	university	2nd level	part 2nd	primary
university		-0.751**	-1.754**	-2.010**
2nd level			-0.438**	-1.213**
part 2nd				-0.355**
primary				
(c) UK	university	2nd level	part 2nd	primary
university		-0.790**	-1.204**	-2.444**
2nd level			-0.097**	-0.956**
part 2nd				-0.446**
primary				

Note: Net parameter estimates, only upper triangle shown.
** indicates significance at 1%.

Panel (a) of Table 4 reports the net effect of the quasi-symmetry parameters. As ex-

pected, the greater the difference in qualifications, the less likely the marriage. For ex-

ample, net of the effect of the margins, the probability of a match between a university

graduate and a person with second level qualifications is less than half ($e^{-0.786} = .46$)

of that between two graduates. This drops to a quarter ($e^{-1.318} = .27$) if the grad-

uate were to marry someone with partial second level education, and to one-tenth

($e^{-2.369}=.09$) for a match with primary qualifications.

This qualification gradient is flatter for marriages not involving university graduates. For example, the probability of marriage between two persons with complete and partial second level qualifications is only slightly less ($e^{-0.194} = 0.82$) than that of homogamy at the complete second level. It seems that the barrier between complete and partial second level is relatively permeable.

4.3 Inter-country differences in general association

Does the two-way association differ between the two countries, in a way that is consistent across time? We examine this possibility in two ways. First, we test model 5 against a uniform difference model (also called log-multiplicative layer effect model, see Erikson and Goldthorpe 1992, and Xie 1992).[15] This model postulates that Ireland and the UK share a common pattern of quasi-symmetric association, but the strength of this association differs between the two countries by a multiplicative factor ϕ^c. This model provides a parsimonious one-degree-of-freedom test for between-country difference. But, as readers can see from Table 3, the uniform difference model (model 6) hardly changes the G^2 of model 5 at all. If there are inter-country differences, they are more complex than can be captured by a single parameter.

$$\text{uniform difference quasi-symmetry:} \quad [WYC][HYC][\phi^c \, \sigma] \quad (6)$$

$$\text{country-specific quasi-symmetry:} \quad [WYC][HYC][\sigma \, C] \quad (7)$$

Model 7 allows the quasi-symmetry parameters to vary freely between countries, and here we see some some marginal evidence of inter-country difference (see the last line of Table 3). Inspecting the parameter estimates of model 7 (see panels (b) and (c) of Table 4), it becomes clear why the uniform difference model fails to improve on model 5. It would not be appropriate to say that one country is generally more

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[15]We fitted the unidiff model using David Firth's llama program (Firth, 1998).

open than the other, as each is closer to the neutral fluidity level in terms of three of the six parameters. Overall, only one of these differences is statistically significant at the conventional 5% level.[16] So our general conclusion is that the basic pattern of educational homogamy is broadly similar in the two countries, as long as we do not consider differences year by year.

4.3.1 Between-country within-year differences

While there is no overall difference between Ireland and the UK if data from all three years are considered together, the two countries might still differ at each time point. To investigate this possibility, we fit a unidiff model over country for 1973, 1986/87, and 1994/95 separately. This model includes the $[WH]$ term, and so it does not constrain educational homogamy to any specific pattern. However, it does constrain such pattern to be the same for Ireland and the UK. The difference between the two countries in the strength of homogamy is measured by the parameter ϕ^c. Given the way we set up the analysis, $\hat{\phi}^c > 1$ would imply that the association is stronger in the UK, while $\hat{\phi}^c < 1$ would imply the opposite.

$$\text{between-country, within-year uniform difference:} \quad [WC][HC][\phi^c WH] \quad (8)$$

Table 5 reports, for each year, the goodness of fit statistics along with the key parameter estimate, $\hat{\phi}^c$ and its standard error. It turns out that the uniform difference model does not fit the 1986/87 data very well, and so the parameter estimate for that year should be interpreted with caution.[17] However, taken together the three $\hat{\phi}^c$ reveal an interesting pattern of inter-country difference over time. While the UK had a much higher level of educational homogamy in the 1970s, the pattern has since reversed. It is Ireland which shows a stronger association between husbands' and wives' qualifi-

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[16]This refers to matches between university graduates and people with partial second level which is easier in the UK than in Ireland.

[17]This implies that the difference between the two countries in that year cannot be captured adequately by a single uniform-difference parameter.

cations in the 1990s. In other words, the overall similarity that we document in the last section is in fact an artefact, a sum of quite opposite differences over time. What is also important is that this pattern is consistent with the argument of Mare, and inconsistent with that of Smits *et al.* (cf. Figure 3). To understand the changing pattern of the inter-country difference, we now turn to examine of time path of change within country.

Table 5: Inter-country difference in the level of educational homogamy at three time points.

	G^2	df	p	ϕ^c	s.e.
1973	6.824	8	0.556	2.743	1.116
1986/87	17.547	8	0.025	0.655	0.134
1994/95	15.469	8	0.051	0.780	0.135

4.4 Change in association over time

Here we consider the two countries separately and model two three-way ($W \times H \times Y$) tables. Similar to the contrast among models 5, 6 and 7 in the previous section, here we compare models 10 and 11 against model 9:

$$\text{constant association:} \quad [WY][HY][\sigma] \tag{9}$$

$$\text{uniform difference:} \quad [WY][HY][\phi^y \, \sigma] \tag{10}$$

$$\text{full interaction:} \quad [WY][HY][\sigma \, Y] \tag{11}$$

Model 9 postulates complete constancy in the quasi-symmetric association, while models 10 and 11 allow some over-time change. Model 10 is the more restrictive of the two because although it allows the strength of association to vary over time, the basic pattern of association is set to be constant within country. We use two ϕ^y parameters to capture the difference between three time points. Model 11 allows the quasi-symmetry association to vary freely over time.

We see from Table 6 that the constant association model actually gives a satisfactory fit to the Irish data at the conventional 5% level. We also see that the uniform

Table 6: Changing association over time

	Model	G^2	df	p	model comparison	ΔG^2	Δdf	p
Ireland	9 $[WY][HY][\sigma]$	31.234	21	.070				
	10 $[WY][HY][\phi^y \sigma]$	24.150	19	.190	9–8	7.084	2	.029
	11 $[WY][HY][\sigma Y]$	13.427	9	.144	10–9	10.723	10	.380
UK	9 $[WY][HY][\sigma]$	42.947	21	.003				
	10 $[WY][HY][\phi^y \sigma]$	24.405	19	.181	9–8	18.542	2	.000
	11 $[WY][HY][\sigma Y]$	11.115	9	.268	10–9	13.290	10	.208

Note: σ are the quasi-symmetry parameters, ϕ^y are the uniform difference parameters.

difference model improves the fit of model 9 significantly, and that the less parsimonious model 11 does not fit the data better than does model 10. Thus the uniform difference model is our preferred model for Ireland. Bascially the same result can be seen for the UK.

Inspecting the uniform difference parameters ϕ^y (Table 7), we see that the strength of the quasi-symmetric association in Ireland increased by a factor of 3 between 1973 and 1986/7, and then it levelled off. In sharp contrast, the trend for the UK since 1973 has mainly been a downward one, although there seems to be a rebound in the association since the mid 1980s. It is these very different time paths which produce the changing pattern of inter-country difference that we saw in the last section.

Table 7: Uniform difference parameters for Ireland and the UK

	Ireland		UK	
1973	1		1	
1986/7	3.416	(1.826)	0.586	(0.074)
1994/5	3.783	(1.963)	0.750	(0.107)

Note: ϕ^y for 1973 is set to 1. Standard errors are in parentheses.

5   Summary and Discussion

How does educational homogamy vary over time and between countries? Smits *et al.* argue that there is an inverted-U shaped relationship between level of economic development and the net association between husbands' and wives' qualifications. They also report that the strength of the association is stronger in Catholic countries than in Protestant countries.

Our findings are, for the most part, inconsistent with these claims. We find that in the last quarter of the twentieth century, Ireland and the UK share a broadly similar pattern of educational homogamy, which is quasi-symmetric in character, with no hypergamy over and above that which can be attributed to the marginals.

In the 1970s, the strength of homogamy was stronger in the UK than in Ireland. This is inconsistent with the religious-cultural claim of Smits *et al.* Moreover, while we see a decline in the association between husbands' and wives' qualifications in the UK for the next twenty years, in Ireland, the association first increased between the 1970s and the 1980s, and then levelled off. Since by all reasonable measures of economic development, both countries are on the right-hand side of the inverted-U curve, the time path we observe for Ireland is inconsistent with the prediction of Smits *et al.*

These results urge us to reconsider the reasoning behind the inverted-U curve argument. We believe the "romantic love" hypothesis is rather ad hoc and unconvincing. Most individuals certainly feel romantically attracted to somebody at some points of their lives. However, romantic feelings, and personal choice in general, are themselves structured by social forces, including, for example, the timing and the social context in which individuals come into contact with each other, men's and women's roles at home and in the society at large, and macro factors such as relative group size. We think it is quite misleading to consider romantic love as something exogenous to and competing with other social processes, such as status attainment.

What, then, are the social processes that might account for the divergent time paths of Ireland and the UK? Without further analysis, we can only offer some speculative

comments here. We believe that our results are consistent with Mare's argument of the effect on homogamy of the timing of school departure and first marriage. As we report in section 2.4, this time-gap used to be much wider in Ireland than in the UK, but because of the immediate post-war trend towards early marriage and that of rising school-leaving age, it has been narrowing in both countries for at least two decades after the second world war. This should have led to a higher level of homogamy. However, while the time-gap has stopped narrowing, and perhaps even begun to widen, in the UK from the early 1970s, in Ireland it has continued to narrow over much of the 1970s. This difference in the timing of one of the most important changes in demographic behaviour might account for the divergent time paths reported here. And if, indeed, this is the main social force driving the change in the strength of educational homogamy, because of Ireland's recent convergence to the European average in terms of age of marriage, educational attainment, and so on, we expect to see a decline in homogamy in Ireland in the future.

There are other social changes which might be relevant. For example, compared with the UK, Ireland has seen a much more dramatic change in women's educational attainment and economic activity over the last few decades. This might also heighten the strength of homogamy in Ireland to a greater degree, as the additional economic importance of the wife's role means her educational level becomes far more salient in the marriage market.

The growth in cohabitation may be important in a number of ways. First, some people cohabit instead of marrying and thus will be absent from our table. Secondly, where cohabitation precedes marriage, it may affect the spouse choice (a potentially more casual decision possibly leading to less homogamy). Thirdly, where cohabitation precedes marriage the actual time-gap will be less than that measured (thus possibly increasing homogamy). We cannot know what the effect would be without new data and new analysis, and the present results have to be read with this limitation in mind.

Raymo and Xie (2000) found no difference in the strength of homogamy between their Confucian societies and the US. We see a complex picture in which the difference

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between Ireland and the UK changes over time. Granted, ours is a tiny sample of two and that of Raymo and Xie is a sample of four. But the cumulation of these negative results adds to our concern as to whether the religious-cultural differences picked up by Smits *et al.* might simply be statistical or measurement artefacts. This is especially the case since the interpretation Smits *et al.* give to these differences is again rather ad hoc. Specifically, Smits *et al.* point to the cultural conservatism of Catholics as the reason of the supposedly strong educational homogamy in Catholic societies. It is not clear to us how cultural conservatism in areas such as sexual morality, women's rights and family policy would lead to stronger or weaker educational homogamy. It is quite possible that because diffused cultural values (whatever they are) permeate the marriage market, its effect on educational homogamy is neutral.

In summary, we have obtained results that are inconsistent with recent comparative educational homogamy research, and we are sceptical of the interpretations or mechanisms suggested. We agree that educational homogamy is a key indicator of social openness, but it seems to us that the dynamics of educational homogamy might be more profitably modelled and understood in the framework of demographic and other social processes rather than in terms of vaguely defined cultural changes.

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