“Differences in Educational Homogamy:

Testing the "looser bond" and "winnowing" hypothesis

using longitudinal data from the Mexican Family Life Survey”

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1. Introduction

Several regions of the world have experienced the emergence of new value orientations toward greater gender equality, individualism, secularism, distrust of traditional institutions, and more open attitudes toward sexuality that have changed conceptions about dating, marriage and family (Van de Kaa 1987; Lesthaeghe 2010). At the population level, this cultural shift have been accompanied by a rise in cohabitation, the postponement of marriage and fertility, and the increase in the proportion of childless women and non-marital childbearing (Lesthaeghe 2010; Seltzer 2000). The trend started in several industrialized countries, since the 1960s, and has continued to spread, to different degrees, to other regions of the world, including Latin America (Bumpass et al. 1991; Lesthaeghe 2010; Esteve 2012c; Seltzer 2000).

Changes in nuptiality patterns and the adoption of new institutional arrangements at union formation have inspired researchers to examine differences and similarities between traditional and non-traditional family institutions (Lesthaeghe 2010; Smock 2000; Esteve et al 2012a). The rise of cohabitation have motivated researchers to understand its role in family formation, by comparing cohabiting and married couples in several outcomes that are relevant in terms of family well-being, such as duration, fertility, and children's outcomes (Manning and Lichter 1996; Morrison and Ritualo 2000; Seltzer 2000). Other research focuses on partner choice and describes the characteristics of the individuals forming the different types of relationships (e.g. Schwartz 2010; Hamplova 2008; Blackwell and Lichter 2000 2004; Schoen and Weinick 1993). Yet, another line of research, attempts to understand whether cohabitation can actually be treated as a different social institution (e.g. trial marriage, alternative to single) or as an institution that shares similar characteristics and functions as marriage (e.g. alternative to marriage) (Heuveline and Timberlake 2004; Casper and Bianchi

2002; Rindfuss and Vandenheuvel 1990). Some studies go further and investigate to what extent cohabitation differs across distinct national contexts (Heuveline & Timberlake 2004; Esteve 2012a).

In the present study, my primarily focus is on the process of partner choice. Since partners' socio-economic characteristics are associated with subsequent fertility behavior, marital stability, and children's outcomes, examining the socio-economic differences between couples that opt for cohabitation and couples who choose to marry is a first step to understand some of the implications that the spread of cohabitation may have in the social reproduction of inequality. I compare cohabitation and marriage by investigating spousal resemblance in terms of education, since educational assortative mating plays a key role in maintaining social inequality from one generation to the next (Mare 1995; Mare and Maralani 2006).

Based on the idea that education is the most important indicator of economic success, two different hypotheses are often found in the literature to explain differences in assortative mating by union type: (1) the "looser-bond" hypothesis, and the (2) double-selection or "winnowing" hypothesis. The "looser-bond" hypothesis assumes that cohabitation is a new institutional arrangement, conceived as an alternative to marriage, which arose in response to a cultural shift in values involving greater individual autonomy and more gender equality; hence it is a type of relationship in which both partners equally place a high value on socio-economic characteristics of potential partners. This hypothesis predicts more educational homogamy in cohabitation than in marriage (Schoen and Weinick 1993). By contrast, the "winnowing" hypothesis conceives cohabitation as a trial marriage where people become more selective as they move from cohabitation to marriage. This hypothesis predicts more educational homogamy in marriage than in cohabitation (Blackwell and Lichter 2000 2004).

Empirical evidence is not conclusive. Studies using cross-sectional data provide support for the "winnowing" hypothesis (Blackwell and Lichter 2000 2004), other studies find

support for the "looser bond" hypothesis (Schoen and Weinick 1993) and others find no difference in educational homogamy across union type (Jepsen and Jepsen 2002). Given the inconsistency of the findings, Schwartz (2010) shows how results from cross-sectional data may be driven by selective exits by union type, and finds no difference in educational homogamy in partner choice.

Most of this evidence comes from the United States (U.S.). However, the meaning of cohabitation may vary depending on the social and historical context (Seltzer 2000; Heuveline and Timberlake 2004). For example, in Latin America cohabitation and marriage have co-existed historically, since colonial times (De Vos 1998). Even though research on Latin America may shed some light in the consequences of having a dual-nuptiality system in the structure of inequality, little is known about assortative mating patterns in this region due to scarcity of data.

In the present study, I investigate the "winnowing" and "looser bond" hypotheses in one Latin American country: Mexico. I use longitudinal data from three waves of the Mexican Family Life Survey (MxFLS), a nationally representative sample ideally suited for these study since it captures complete marital and cohabitation histories, thus allowing addressing the implications of selective dissolution by union type. I test the "winnowing" and "looser bond" hypotheses following the stock-and-flow framework proposed by Schwartz (2010). This framework incorporates, on the one hand, the traditional approach that compares educational homogamy between the stock of ever-married and ever-cohabitated couples. On the other hand, this framework allows a decomposition of these stocks in couples that persist and couples that select out from the union, thus allowing testing additional implications of these hypotheses. Finally, this framework allows a better understanding of which flows are responsible of the differences in educational homogamy between the stocks of the different union types. The analysis proceeds in four steps. First, I investigate union type differences in

educational assortative mating through the comparison of stocks of ever-married and ever-cohabiting couples. Second, I examine differences in educational homogamy among couples that select-out from cohabitation, and couples who progress from cohabitation to marriage. Third, I examine differences in educational homogamy between cohabiting couples that persist and couples that select-out from cohabitation (and do not marry). Finally, I test whether married couples that have cohabited before marrying are more likely to be homogamous than married couples who have not cohabited.

2. Theoretical Background

Theoretical models that attempt to explain educational homogamy differentials between cohabitation and marriages can be divided in two types depending on the meaning they attribute to education. While economic and exchange theories conceived education as an indicator of labor market success (Blossfeld 2009; Mare 1991; Treiman 1970), cultural matching theories conceive education as an indicator of cultural background, values, tastes, and lifestyles (DiMaggio and Mohr 1985; Mare 1991).

Economic and exchange theories

Economic and exchange theories explain the matching process by assuming that marriage is voluntary, individuals are rational and seek to maximize their well-being, and men and women face competition for the best possible mate (e.g. Edwards 1969; Becker 1973; Fox 2009). Both of these theories assume the existence of gender asymmetries in preferences for partner´s socio-economic characteristics (i.e. women emphasize preferences for socio-economic characteristics more than men) in order to explain positive gains from marriage. As a result, the classic economic model predicts that gains from marriage are maximized when women specialize in home production and men in labor market activities (Becker 1973 1974). Similarly, exchange theory predicts that gains from marriage only occur when potential partners differ in at least one trait (e.g. education) (Rosenfeld 2005).

However, given the spread of cohabitation some researchers have questioned the existence of gender asymmetries in socio-economic preferences for potential partners. Instead, they suggest that under a shifting cultural context that favors attitudes involving more individualism, both, males and females, might equally place a high value on characteristics associated with greater individual autonomy, such as educational attainment, because it serves as an indicator of potential economic success and economic independence. They portray cohabitation as a different institutional arrangement, a "looser bond", that may be chosen as an alternative to marriage but with distinct goals, norms and behaviors involving more individual autonomy and a lack of long-term commitment (Schoen and Weinick 1993). While gains from marriage arise from departures of homogamy due to the existence of gender asymmetries in preferences for socio-economic characteristics, gains from cohabitation involve preferences in which both partners place equally high importance to these characteristics. As a consequence, greater educational homogamy is expected in cohabitation than in marriages, and lower educational homogamy is expected in couples that select out from cohabitation than in couples that remain cohabiting.

Alternative explanations that attempt to explain homogamy differences by union type, conceive cohabitation, as a trial marriage, in which cohabiting is part of a dynamic search process in which as individuals progress in their relationships from dating to cohabiting to marriage they become more selective in their choices (Blackwell and Lichter 2000 2004). Since education is an indicator of potential economic success that is hierarchically ordered, individuals would prefer to form a union with others with comparatively more desirable characteristics than their own (South 1991; Mare 2008; Becker 1973), more specifically, with higher education. As they become more selective in their choices they may weight more heavily their preference for these comparatively more desirable characteristics. However, the constraints imposed by competition would allow them to achieve someone with at least the

same resources they can offer in exchange in the marriage market. The "winnowing" or double-selection hypothesis predicts that as individuals progress from dating to cohabiting to marriage, homogamy will increase. It also implies that couples that select out from cohabiting will be less homogamous than couples that progress from cohabitation to marriage.

Cultural matching

A cultural matching hypothesis suggests that individuals tend to match based on similar traits regarding cultural background, shared values and lifestyles (DiMaggio and Mohr 1985). If education is conceived as an indicator of this kind of traits, it may be treated more like an ascribe characteristic such as race, ethnicity, and religion rather than as an achieve characteristic. Treating education as an ascribed characteristic, do not change the predictions of the "winnowing" hypothesis, because it argues that individuals tend to sort themselves into similar achieved and ascribed characteristics (Blackwell 2000; Schwartz 2010). By contrast, treating education as an ascribed characteristic changes the original prediction of the "looser bond" hypothesis. In particular, since marriage is conceived as a long-term institution while cohabitation is not, sharing similar values may be more relevant for married than for cohabiting couples, consequently, higher homogamy would be expected in marriages than in cohabitation.

3. Previous Research

Empirical evidence is not conclusive. Studies using cross-sectional data provide support for the "winnowing" hypothesis by showing that educational homogamy among cohabiting couples is lower than among married couples (Blackwell and Lichter 2000). Other evidence shows that among the highest educated individuals, those who have ever-cohabited are most homogamous compared to those who never cohabited (Blackwell and Lichter 2004). Yet, other studies find support for the "looser bond" hypothesis (Schoen and Weinick 1993) and others found no difference in educational homogamy across union type (Jepsen and

Jepsen 2002). Another line of research, that examines transitions find no difference between cohabitors that separate and those who marry (Goldstein and Harkett 2006).

Given the inconsistency of the findings, Schwartz (2010) shows how results from cross-sectional data are likely to be affected by selective exits by union type. Using a stock-and-flow approach and longitudinal data, she finds that educational homogamy differences in prevailing unions, across union type, are not due to differences in partner choice. Instead, she finds that these differences are mainly driven by selective union dissolution. In particular, she finds that dissimilar marriages are more likely to dissolve, while dissimilar cohabitors are more likely to persist. Furthermore, in the case of newly formed unions she finds no significant differences in educational homogamy across union type; moreover, she finds high rates of educational homogamy in both types of union, suggesting that the observed union patterns are associated with the fact that marriage markets are partially structured by education.

The majority of the evidence comes from the U.S.; however, the meaning of cohabitation may vary depending on the social and historical context. Cross-national research shows that cohabitation in the U.S. is characterized by a very short duration compared to other industrialized nations and that it is more similar to singlehood than to marriage (Rindfuss and Vandenheuvel 1990; Seltzer 2000; Heuveline and Timberlake 2004). Moreover, the decreasing proportion of cohabitations that end in marriage, from the 1970s to the 1990s, indicates that cohabitation is not, in general, a stage in the marriage process in the U.S. (Seltzer 2000). Finally, cohabitation is not a widely socially accepted institution to raise a family in the U.S.; even though, it has spread widely[1], family laws still give cohabitors few of the rights of married couples, which reflects the historical legacy of a social system where

[1] More than two-thirds of American adults cohabit before they marry (Kennedy and Bumpass 2008).

marriage was the only acceptable institution to form a family (Seltzer 2000; DeVos 1999; De Vos 1998).

However, for other societies where, historically, extra-marital unions have been socially recognized institutions for childbearing and childrearing, the role of cohabitation in family formation and its characteristics may differ widely from those prevalent in the U.S. For example, in Latin America two types of cohabitation coexist: modern and traditional cohabitation. While modern cohabitation may be conceived as an alternative to marriage with different goals and norms toward more individualism and gender equality (Rodriguez -Vignoli 2005; Fussell and Palloni 2004), traditional cohabitation is a historical and cultural institution usually conceived as an alternative to marriage with the same goals and norms. Traditional cohabitation is often chosen by the economically disadvantage (Lopez-Ruiz et al. 2009; De Vos 1999), while modern cohabitation is increasingly chosen by the more educated (Esteve et al. 2012a). The accelerated spread of modern cohabitation, in the last four decades in Latin America, may reflect that historically cohabitation has been a socially recognized institution to form and raise a family. The Latin American case is an example of a system where cohabitation and marriage have co-existed historically. Research on Latin American may provide some insight in the possible consequences that a dual-nuptiality system may have in the structure of inequality in other societies in which this type of system is emerging.

However, little is known about assortative mating patterns in Latin America due to scarcity of data. At the national level, most cross-national studies use census data to examine educational homogamy differences between marriage and cohabitation (De Vos 1998; López-Ruiz, Esteve and Cabré 2009; López-Ruiz, Esteve and Cabré 2008; Esteve and McCaa 2007) and find higher odds for educational homogamy among married couples than among cohabitors. This "homogamy gap" between married and cohabiting couples has narrowed as cohabiting rates have increased in the region (Esteve et al. 2013). Based on these results, some

researchers provide slight evidence supporting the "winnowing" hypothesis. However, using cross-sectional data poses important limitations to test this hypothesis, since results are likely to be driven by selective dissolution by union type (Schwartz 2010).

In the present study, I investigate the "winnowing" and "looser bond" hypotheses in one Latin American country: Mexico. I use longitudinal data from a nationally representative sample of the Mexican population, which allows addressing some of the implications of selective dissolution by union type to test these hypotheses.

4. The Study Site

Since the last half of the twentieth century, Mexico has experienced a profound demographic, economic, and social transformation. Life expectancy has increased by 22 years over the last 5 decades (i.e. a girl born in 2000 can expect to live to age 77 and a boy to age 73 (Villagómez 2009; López 2001)). Total fertility rate has fallen from above 6 children per woman in 1975 to 2 children per woman in 2009 (Romo et al. 2009). In terms of education, in the last 15 years, the average completed years of schooling increased from 6.6 in 1990 to 8.1 in 2005. For women this increase was from 6.3 to 7.9 years of schooling and for men was from 6.9 to 8.4 (INMUJERES 2009). Between 1970 and 2010 the percentage of women that completed secondary education increased from 2.6% to 41.2% (Esteve et al. 2012b). Improvements in women's education have been coupled with increases in their labor force participation (from 17% in 1970 to 42% in 2009) (INMUJERES 2009).

These demographic changes and the improvements in women's economic position in Mexican society have led to new configurations of the marriage market and in union formation patterns. In the last four decades, among women age 25 to 29, cohabitation rates increased from 16% to 37%, the proportion of single mothers increased from 11% to 16%, women with lower educational levels shifted from marriage to cohabitation, while women

with tertiary education shifted from marriage to single (Esteve et al. 2012b). Moreover, the divorce rate increased from 4% to 16% between 1980 and 2010 (INEGI). Finally, from 1970 to 2000, Mexico experienced increases in educational homogamy and decreases in educational hypergamy (Esteve and McCaa 2007).

Cohabitation in Mexico

Marriage and non-marital cohabitation are two institutional arrangements that have coexisted since colonial times in Latin America (Lopez et al. 2009; Castro 1997). One of the historical explanations about the origins of non-marital cohabitation in Latin America suggests that during the colony, given that males outnumbered females from European descent, societal norms allowed sexual relations with indigenous women; however, due to restrictions imposed by religion these unions were never formalized (Lopez et al. 2009; Castro 1997). For the population in the lower income distribution, non-marital cohabitation became an alternative to marriage because they could not afford the costs associated with the formalization of the union (Lopez et al. 2009; Castro 1997).

Currently, prevalence of cohabitation in Latin America varies greatly by region. In 2002, Dominican Republic showed one of the highest percentages of cohabitation (64%) while Mexico showed one of the lowest (20%) (Castro et al. 2008; Lopez-Ruiz et al. 2009). Although Mexicans are more likely to form marriages, from 1970 to 2000 cohabitation increased from 13% to 20% (Lopez-Ruiz et al. 2009). In Mexico, cohabitation is an institution where childbearing and childrearing activities are socially acceptable (Castro et al. 2008). Recent amendments in family laws give cohabitors the same rights and obligations as married couples after two years of cohabitation. Moreover, fertility differences between union types are non-existent (Rodriguez -Vignoli 2005). Whereas, about 32% of non-marital cohabitation unions eventually turn into marriages after 25 years (Goldman and Pebley 1986), a large

proportion of them are never legalized. Even though cohabitation is socially recognized, marriage is considered a more prestigious and stable institution.

Until today, the less educated groups are the most likely to cohabit. In 2000, 81% of the individuals cohabiting attended less than secondary school compared to 68% of married individuals (Lopez-Ruiz et al. 2009). The existence of a negative educational gradient of cohabitation suggest that the spread of cohabitation may indicate that economic constraints, more than preferences, are guiding couples' decisions to cohabit instead of marrying (Castro et al. 2008). However, some researchers suggest that the existence of this gradient is historically-rooted, and since the spread of cohabitation had occurred at the same time as improvements in women's education, it is very likely that a shift in preferences for union type is also occurring (Esteve et al. 2012c). Furthermore, since the spread of cohabitation among the most educated has been the main driving force behind the expansion of cohabitation in the country (Rodriguez -Vignoli 2005), changes in preferences rather than economic constraints may explain better the spread of cohabitation (Rodriguez -Vignoli 2005; Fussell and Palloni 2004).

5. Analytical Framework

Based on the stock-and-flow framework proposed by Schwartz (2010), Figure 1 describes the model I used in this study to examine educational homogamy differences between cohabiting and married couples.

<Figure 1>

Given that previous research shows that socio-economic status and education are less relevant in partner´s choice of second order marriages (Dean 1978; Shafer and James 2013), my primarily interest is the analysis of first order unions. My analysis is divided in two parts, I start with the analysis of stocks and then I proceed with the analysis of flows.

First, I compare the stock of ever-cohabiting and ever-married couples (boxes A and B)[2]. The stock of ever-cohabiting couples is constituted by cohabitation entries and cohabitation exits (transitions 1, 2, and 3). The stock of ever-married couples is constituted by marriage entries through cohabitation, marriage entries without cohabiting with spouse and marriage exits (transitions 3, 4, and 5). Moreover, I stratify homogamy rates by education to examine differences in homogamy patterns between couples with low and high education.

Second, I compare educational homogamy between couples that select-out from cohabitation and couples who progress from cohabitation to marriage (transitions 2 vs. 3). Moreover, I compare cohabiting couples that persist to couples that select-out from cohabitation (and do not marry) (Transition (1-2-3) vs. 2). Finally, I test differences in homogamy among married couples that have cohabited with their spouse before marrying to married couples who did not cohabited with their spouse (transitions 3 vs. 4).

6. Data and Methods

Data

I use data from three waves of the MxFLS, which is an ongoing national representative longitudinal survey of individuals, households, and communities. The baseline survey was fielded in 2002, its original sample size was of 35,000 individuals, and rural population was oversampled. The second and third waves were conducted in 2005 and 2009-2010, respectively, and recontact rates at the household level were about 90% in the both waves. The MxFLS is designed to collect information of new households established by panel members who moved-out from their household at baseline and of new household members. By 2010, the sample consists of about 48,000 individuals.

[2] Schwartz (2010) compared the stock of cohabiting and married couples, at a given time, for all parities.

The MxFLS is well suited to study educational assortative mating because it gathers a rich set of information on respondent's cohabiting and marriage retrospective histories, as well as, partner's educational characteristics. Moreover, the prospective nature of the survey allows following any change in respondent's marital status, from 2002 to 2009-2010. Furthermore, this information allows researchers to clearly identify first unions from subsequent ones. In addition, if the partners mentioned by respondents in the retrospective histories are MxFLS respondents as well, their education and marital status information is obtained from their own responses, instead of relying in the response of their partner. Finally, since new household members are added to the sample, information about new partners is collected.

Sample Selection

First, I selected a sample of respondents who were 20 to 60 years old by the third wave of the MxFLS and have reported being in a union (i.e. marriage or cohabitation) at least once. Appendix 1 shows a general description of the MxFLS sample. The MxFLS has 23,445 respondents between the ages 20 to 60 years old, of these respondents 78% have been in a union, and 18% have never been in a union. Hence, 18,321 respondents comprise my eligible sample.

Second, I use retrospective histories to identify union parity. Of the 18,321 respondents 19% never responded this section so parity is missing for these cases. However, instead of dropping all these observations, I keep respondents 25 years old (by 2009) or younger and assume that the union observed in the data is their first. After, eliminating observations of respondents from whom I cannot determine the union type, the sample is reduced to 16,308 respondents (see Table 1 in Appendix 1).

Third, from the 16,308 respondents I generate a sample of 12,233 couples, and then I drop 1,339 couples (4% marriages and 6% cohabitations) due to missing data in the variables

of interests, resulting in a sample of 10,894 couples. This sample of couples consists of unions formed by at least one partner with no previous unions, where 71% are ever-married and 29% have ever-cohabited (see Table 1 in Appendix 2). Moreover, 51% are couples in which both partners are in their first union; 6% are couples formed by one partner with at least one previous union and the other with none; and, 43% are unions formed by at least one partner with no previous unions and missing parity information for the other partner[3].

My primarily interest is on first order unions; however, since 43% of the sample includes couples with partial information on parity, I conduct a supplementary analysis (see Appendix 3) to examine differences in educational homogamy patterns by couple's type in order to determine if keeping all the observations are likely to bias my results. The supplementary analysis shows no strong evidence to support the existence of differences across couple's type; hence, 10,894 couples comprise the final analytical sample.

The unit of analysis is couples. In the first part of the analysis (where I analyze stocks of ever-cohabited and ever-married couples) couples that cohabited with their spouse before getting married are two times in the sample. In the second part of the analysis, since I classify couples by transition type I eliminate duplicates and classify couples to mutually exclusive categories; hence 10,441 couples comprise the transition sample.

Variables

Educational attainment is collapsed in four ordered categories: (1) elementary school or less, (2) secondary school, (3) some high school, and (4) high school graduate or more. Measurement of education is based on education level by the time the third wave of MxFLS was conducted (see Appendix 4 for the criteria to generate this variable). Homogamy is a dummy variable that indicates whether partners' educational attainment is the same or not.

[3] The information of one of the partners is not available because: (1) the partner is not an MxFLS respondent, or (2) if he/she is a respondent, then he/she did not answer the retrospective marital and non-marital cohabitation history.

Hypergamy is a dummy variable that indicates whether the male shows a higher educational level than the female within a couple.

Crossing variables are dummies coded based in the following designed matrices:

Crossing 1

Male's Education	Female's Education 0-6	7-9	10-11	12+
0-6	0	1	1	1
7-9	1	0	0	0
10-11	1	0	0	0
12+	1	0	0	0

Crossing 2

Male's Education	Female's Education 0-6	7-9	10-11	12+
0-6	0	0	1	1
7-9	0	0	1	1
10-11	1	1	0	0
12+	1	1	0	0

Crossing 3

Male's Education	Female's Education 0-6	7-9	10-11	12+
0-6	0	0	0	1
7-9	0	0	0	1
10-11	0	0	0	1
12+	1	1	1	0

Crossing parameters represent the varying degrees of difficulty of crossing different educational barriers (Powers and Xie 2008). Crossing 1 parameters represent the difficulty for someone with less than 7 years of education of forming a union someone with 7 or more years of education. Crossing 2 and crossing 3 parameters represent the difficulty of crossing the educational barriers 10+/>10 and 12+/<12, respectively.

Methods

To examine differences in educational homogamy between the stocks of ever-cohabitors and ever-married couples, I rely on log-linear models to examine whether the association between husband's and wife's educational attainment varies by union type. I estimate a series of log-linear models to analyze a three-way table that is produced by cross-classifying wife's education (0-6, 7-9, 10-11, 12+), husband's education (0-6, 7-9, 10-11, 12+), and union type (ever-married, ever-cohabited) which results in a 4 X 4 X 2 = 32 cell table. Log-linear models permit estimating associations between partners' characteristics controlling for marginal distributions. Since my goal is to analyze the association between partners' education across union type, I begin with a "conditional independence" model (MU FU), which assumes no variation in the association between partners' education across union type. The formal model can be written as follows.

$$\log(f_{ijk}) = \mu + \mu_i^M + \mu_j^F + \mu_k^U + \mu_{ik}^{MU} + \mu_{jk}^{FU}$$

where M denotes husband's education (i=1,…,4), F is wife's education (j=1,…,4), U is type of union (k=1,2), and f_{ijk} is the expected number of unions between husbands in education category i and wives in education category j , and union type k. I add to the baseline model the interaction term μ_{ij}^{MF} that allows for unrestricted association between partners' education and constrains this partial association to be constant by union type. Then, I add homogamy, crossing, hypergamy, and diagonal terms to the baseline model to investigate differences in educational assortative mating by union type.

To examine the impact of selective exits on the stocks of ever-cohabitors and ever-married individuals, I estimate a similar set of log-linear models but instead of cross classifying by union type I cross-classify the unions by transition status into 5 categories: cohabitation entry and remain together, cohabitation exit and separate, cohabitation exit and entry to marriage, marriage entry without cohabiting, and marriage exit which results in a 4 X 4 X 5 = 80 cell table. Model comparisons rely on the Bayesian Information Criterion (BIC) and G^2 statistics.

7. Results

Descriptive Statistics

Table 1 shows the distribution of educational attainment for male's and female's education by union type. The table reveals that cohabiting couples tend to be less educated compared to married couples. Table 2 shows the frequencies and distribution of female's education conditional on male's education by union type. In general, the table reveals a tendency for educational homogamy; however, the table also shows a pattern of educational hypergamy among females with secondary school. These patterns are similar for both union types. Table 3 shows observed rates of intermarriage by union type. This table shows that educational homogamy is more common among ever-married than among ever-cohabited

couples; while, hypergamy[4] is more common among cohabitors. Moreover, cohabiting couples are (i) more likely to cross the 7+/<7 educational barrier than married couples, (ii) as likely as married couples to cross the 10+/<10 educational barrier, and (iii) less likely to cross the 12+/<12 educational barrier than married couples.

Table 4 shows the distribution of unions by transition status. As expected, the table reveals that 14% of the sample consists of cohabitating couples that remain together as cohabitors, 11% are cohabiting couples that separated, 5% are cohabiting couples that decide to marry, 56% are married couples with no previous cohabitation and remain together, and 14% consist of couples that exit from marriage. This table also shows that among the stock of ever-cohabited couples, 51% remained together as cohabitors, 41% separated, and 9% married. Moreover, only 4% of the marriages are preceded by cohabitation and 19% of marriages separate or divorce.

To examine the association between male's and female's educational attainment controlling for the marginal distribution of education I present the results of the log-linear analysis in the next section.

Log-Linear Models

I estimate a series of log-linear models to explore educational homogamy patterns by union type. Model specifications and fit statistics of selected models are provided in Table 5[5]. I present G^2 (likelihood ratios) and BIC statistics to measure the goodness of fit of the models. A significant G^2 indicates that the saturated model fits better the data than the reduced model. A smaller value of BIC indicates that the reduced model is more likely than the saturated model.

Model 1 (the conditional independence model) assumes no association between partners' education across union type. Model 2 allows for unrestricted association between

[5] In Appendix 5, I estimate an alternative set of models that control for couple's type and find similar results.

partners' education, but this is assumed to be constant across union type. This model accounts for most of the association in the table as it is shown by the substantial decrease in G^2 from Model 1. Models 3 to 6 add homogamy, crossing, hypergamy, and diagonal parameters to Model 2 and relax the assumption that assortative mating is invariant across union type. Based on the BIC statistics all these models improve the fit of Model 2, however, Model 3 is most likely to be the true model. Table 6 show log-linear models using transition status instead of union type. Results using transition status are similar to those in the previous analysis.

Assortative mating patterns by union type

To investigate homogamy differences by union type, I estimate homogamy parameters from the preferred model (MU_FU_MF_HU). Figure 2 shows these parameters graphically.

<Figure 2>

I find that the odds of homogamy are about 30% (exp{1.87-2.13}) higher for ever-married compared to ever-cohabiting couples. Consistent with previous research using the Mexican census data (Lopes-Ruiz, Esteve and Cabres 2009; Esteve et al. 2013), this result supports the "winnowing" hypothesis that predicts more homogamy among marriages than among cohabiting unions. If education is conceived as an indicator of cultural background, values and lifestyle, this result would support the cultural matching hypothesis. Next, I examine educational specific homogamy parameters from Model 6 (MU_FU_MF_DU) in Figure 3.

<Figure 3>

The graph shows greater homogamy among the less educated couples for both union types; moreover, among couples with less than 7 years of education I find that the odds of homogamy are about 50% greater for married than for cohabiting couples, while among couples with 7 or more years of education these odds are about 20% greater for married than

for cohabiting couples. Some researchers suggest that cohabitation in the lower strata is explained mostly by economic constraints more than for preferences for union type; however, if this were the case differences across union type should not be expected, since cohabitation, in this case, would be conceived as an alternative to marriage with the same goals and norms. Yet, I find significant differences across union type, and the difference is higher for couples in the lower educational distribution. Conceiving education as an indicator of shared values, the cultural matching hypothesis would explained that this difference might be related to a change in preferences for union type.

Assortative mating patterns by transition type

To examine educational homogamy by transition status, I estimate parameters of the preferred model (MT_FT_MF_HT). Table 8 shows parameter estimates and Figure 4 present them graphically. I begin by comparing educational homogamy between couples that select-out from cohabitation and couples who progress from cohabitation to marriage. Figure 4 shows that the odds of homogamy of couples that exit from cohabitation to marriage (transition 3) are 54% higher than the odds of homogamy of couples that exit from cohabitation and separate (transition 2). Similar to other studies, I find that homogamous cohabitors are more likely to marry and dissimilar cohabitors are more likely to split up (Schwartz 2010; Goldstein and Harkett 2006); however, contrary to other studies from the U.S., my results are statistically significant, which indicates that a "winnowing" process may be taking place. Alternatively, this would also support the cultural matching theory indicating that couples that shared similar values are more likely to persist. The difference between these two groups contributes to the higher resemblance in the stock of ever-married couples compared to the stock of ever-cohabited couples.

Additionally, I test differences in homogamy among married couples that have cohabited with their spouse before marrying (transition 3) to married couples who did not

cohabited with their spouse (transition 4). If a "winnowing" process were taking place, higher homogamy would be expected from the former group than from the latter; however, consistent with previous research (Schwartz 2010), I find small and not significant differences between the two groups.

Finally, consistent with the cultural matching theory, I find that dissimilar couples (either cohabiting or married) are more likely to dissolve. The graphs shows that the odds of homogamy among persisting cohabiting couples are 26% higher than the odds of couples that select-out from cohabitation (and do not marry); and the odds of homogamy among persisting married couples are 21% higher than the odds of homogamy among couples that select-out from marriage, and these differences are statistically significant. While selective dissolution from marriage contributes positively to the homogamy difference between the stock of ever-married and ever-cohabited couples, selective dissolution from cohabitation contributes in the opposite direction.

Discussion

This paper investigates educational homogamy by union type (i.e. cohabitation and marriage), using data from the MxFLS, a national representative sample of Mexico. I test two hypotheses that explain differences in educational homogamy between marriage and cohabitation. On the one hand, the "winnowing" hypothesis assumes that people become more selective as they move from dating to cohabiting to marriage, hence it predicts greater homogamy in marriages than in cohabitations. On the other hand, the "looser bond" hypothesis assumes that cohabitation is a living arrangement chosen by individuals with more egalitarian values seeking a relationship lacking of long-term commitment. The "looser bond" hypothesis conceives education as an indicator of potential labor market success and individual autonomy and predicts greater educational homogamy in cohabitation than in marriage.

The "looser bond" hypothesis assumes that a cultural shift favoring norms and values toward more egalitarianism and individualism changed preferences for partner´s choice in two dimensions. First, it changed preferences for socio-economic characteristics of potential partners. In particular, this hypothesis suggests that males and females that opt for cohabitation (instead of marriage) would equally place a high value on characteristics associated with economic independence. Second, it changed preferences for the type of relationship seek in terms of commitment. More specifically, this hypothesis assumes that cohabitation implies a "looser bond" because it underlies on the assumption that it is an institution lacking of long-term commitment (Schoen and Weinick 1993). This assumption is based on empirical evidence from the U.S. showing that in several attitudes, such as fertility expectations, cohabitors resemble more closely single than married (Rindfuss and VandenHeuvel 1990), and the duration of cohabitation is shorter than in marriages (Seltzer 2000) (i.e. in the U.S. within the first 10 years of the union, about 60% of first cohabitors and only 30% of first married couples break up (Bumpass & Sweet 1989 Table 4)).

In the Mexican context the assumption that cohabitation implies a lack of long-term commitment could be questionable since about 70% of cohabiting couples last more than 20 years (Ojeda et al. 2008), and there are no differences in fertility behavior between cohabiting and married couples (Rodriguez -Vignoli 2005). Moreover, about 40% of unions who start cohabiting legalize their unions (Ojeda et al. 2008), and most of those who do not legalize their union, gain, after 2 years of cohabiting with their partners, similar rights and obligations than married couples. However, I test this hypothesis because in Mexico cohabitation is also (as in the U.S.) an institution of lower duration than marriage; in this sense cohabitation implies a "looser bond" compared to marriage. Nonetheless, in Mexico this type of union does not lack of a long-term commitment, instead it implies a shorter-term commitment compared

to marriage. In Mexico, within the first 10 years of the union, about 20% of first cohabitors and only 3% of married couples split up (Ojeda and González 2008 Table 8).

In this paper, I find no support for the "looser bond" hypothesis. Contrary to what this hypothesis predicts, I find higher educational homogamy among ever-married than among ever-cohabited couples. Moreover, I find that couples that select out from cohabitation and marry show higher educational homogamy than those who persist cohabiting. By contrast, my results are consistent with the "winnowing" hypothesis in several respects. As predicted by this hypothesis, I find higher homogamy among ever-married than among ever-cohabited couples, and higher homogamy among couples that select out from cohabitation and do not marry compared to those that select out from cohabitation and marry. However, contrary to its predictions, I do not find significant differences between married couples that previously cohabited with their spouse and married couples that did not. Using a stock and flow approach, previous research from the U.S. finds a slight support for the "winnowing" hypothesis (Schwartz 2010), however, in the Mexican context, I find strong support for this hypothesis. Differences across these regions may reflect that in Mexico cohabitation functions as a "trial marriage", since about 40% of the unions that start cohabiting eventually marry (Ojeda et al. 2008), while the U.S. few of unions that start cohabiting end in marriage (Seltzer 2000).

Even though, in general, results are consistent with the "winnowing" hypothesis, they can also be explained by a cultural matching hypothesis that conceives education as an indicator of shared values and lifestyles. Consistent with the cultural matching hypothesis I find that dissimilar couples (either cohabiting or married) are more likely to dissolve. Moreover, since cohabitation is an institution of shorter duration than marriage, education becomes more salient for couples opting for marriage; hence I find higher homogamy in marriages than in cohabitation. Similar to evidence from the U.S. (Schwartz 2010), results

from Mexico suggest that changes in the cultural paradigm involving greater gender equality and greater individual autonomy are not reflected in higher educational homogamy in cohabitation than in marriage.

So far, I have only explained these differences by hypothesizing a change in preferences. However, educational homogamy reflects two forces in the marriage market: demand and supply. On the demand side, individuals' preferences for attributes of their spouses play a key role in determining who marries whom; from the supply side perspective, the choice of whom to marry is constrained by the opportunities to meet people with the desirable attributes individuals are searching for (Kalmijn and Flap 2001). The evidence showed here is consistent with the fact that marriage markets are partially structured by education (Schwartz 2010). In Latin America, the coexistence of traditional and modern cohabitation adds another layer of complexity to the analysis of the structure of marriage and cohabiting markets. Esteve (2013) argues that traditional cohabiting markets in Latin America are less structure by education because "cohabiting couples were historically more likely to be found in the lower social classes, among less educated people and in indigenous populations", while modern cohabitation "spreads into higher social strata" hence it is more structured by education. He argues that, since "marriages are distributed across the educational spectrum" it should be more structured by education. In this regard, the evidence shown in this paper would support the idea that cohabiting markets are less structured by education compared to marriage markets, since lower educational homogamy is found in cohabitation than in marriages.

Finally, this paper also contributes to the literature in the understanding on the effects of selective dissolution in homogamy differences across union type. I find that selective dissolution from marriage contributes positively to the homogamy difference between the stock of ever-married and ever-cohabited couples, which is consistent with research from the

U.S. (Schwartz 2010); however, I find that in the Mexican context, selective dissolution from cohabitation contributes negatively to this difference. In other words, selective dissolution from cohabitation offsets the increase in the homogamy difference due to selective dissolution of marriages.

Table 1: Distribution of Educational Attainment for male's and female's education by union type

		Unweighted		Weighted*	
		Ever-Cohabited	Ever-Married	Ever-Cohabited	Ever-Married
	N	3,106	7,788	3,106	7,788
	(%)	29	71	28	72
Male's Education (%)					
	0-6	41	40	42	36
	7-9	34	30	33	31
	10-11	6	7	6	7
	12+	18	23	19	26
Female's Education (%)					
	0-6	42	42	43	40
	7-9	37	32	36	31
	10-11	6	6	6	7
	12+	15	20	15	23

Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

* I use weights of MXFLS 2002 provisionally, until weights of the third wave are released.

Table 2: Frequency and conditional distribution of female's education given male's education by union type

Panel A. Frequencies

Ever-Cohabited

	Female's Education				
	0-6	7-9	10-11	12+	Total
Male's Education					
0-6	817	362	31	77	1287
7-9	346	486	77	143	1052
10-11	35	96	25	45	201
12+	96	196	59	215	566
Total	1294	1140	192	480	3106

Ever-Married

	Female's Education				
	0-6	7-9	10-11	12+	Total
Male's Education					
0-6	2246	697	70	118	3131
7-9	722	1088	170	373	2353
10-11	86	233	68	137	524
12+	194	471	179	936	1780
Total	3248	2489	487	1564	7788

Panel B. Conditional Distribution (weighted*)

Ever-Cohabited

	Female's Education				
	0-6	7-9	10-11	12+	Total
Male's Education					
0-6	65	26	3	6	100
7-9	35	47	7	11	100
10-11	17	51	12	21	100
12+	17	32	8	43	100
Total	43	36	6	15	100

Ever-Married

	Female's Education				
	0-6	7-9	10-11	12+	Total
Male's Education					
0-6	72	22	3	3	100
7-9	31	45	8	16	100
10-11	18	42	11	29	100
12+	10	24	10	56	100
Total	40	31	7	23	100

Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

* I use weights of MXFLS 2002 provisionally, until weights of the third wave are released.

Table 3. Observed Rates of Intermarriage[(1)] by union type (N=10,894)

	Ever-Cohabited		Ever-Married	
	Unweighted	Weighted*	Unweighted	Weighted*
Homogamous Unions	50%	52%	56%	55%
Hypergamy	27%	27%	24%	25%
Unions Crossing Educational Barriers				
7+/<7 years of schooling	30%	30%	24%	24%
10+/<10 years of schooling	24%	23%	22%	23%
12+/<12 years of schooling	20%	18%	19%	20%

Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

* I use weights of MXFLS 2002 provisionally, until weights of the third wave are released.

Table 4: Transition status

		Weighted*
Transition Status		
Cohabitation entry and remained together		14%
Cohabitation exit and separated		11%
Cohabitation exit and married		5%
Marriage entry with no previous cohabitation and remained together		56%
Marriage Exit		14%
	N=	10441
Ever-cohabitated		
Entry and remained together		51%
Cohabitation exit and separated		41%
Cohabitation exit and married		9%
	N=	3106
Marriage entries		
Previous cohabitation with spouse		4%
No previous cohabitation		96%
	N=	6382
Ever-Married		
Entry and remained together		81%
Exit from marriage		19%
	N=	7334

Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

* I use weights of MXFLS 2002 provisionally, until weights of the third wave are released.

Table 5: Goodness of Fit of Selected Models of Educational Assortative Mating on Marriages and Non-marital cohabitation. (N=10,894 couples)

	Model	LL	G^2	df	p	BIC
Panel A: Models based in a 4 X 4 X 2 Contingency table (Males's educ X Female's Education X Type of Union)						
0	MFU	-112.7	0.0	0	1.000	0
1	MU_FU	-1970.8	3716.2	18	0.000	3549
2	MU_FU_MF	-139.2	52.9	9	0.000	-31
3	MU_FU_MF_HU	-122.4	19.4	8	0.013	-55
4	MU_FU_MF_CU	-115.4	5.4	6	0.493	-50
5	MU_FU_MF_HypU	-126.0	26.7	8	0.001	-48
6	MU_FU_MF_DU	-121.1	16.8	7	0.019	-48

Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

Notes: Model terms are as follows: M=Male partner's education, F=Female partner's education, U=Union type, H=Homogamy; Hyp=Hypergamy; C=Crossing; D=Specific Homogamy (Both partners <=6 yrs. Educ or Both partners > 6)

Table 6: Goodness of Fit of Selected Models of Educational Assortative Mating on Marriages and Non-marital cohabitation. (N=10,441 couples)

	Model	LL	G^2	df	p	BIC
Panel A: Models based in a 4 X 4 X 5 Contingency table (Males's educ X Female's Education X Transition Type)						
0	MFT	-231.8	0.0	0	1.000	0
1	MT_FT	-2042.1	3620.5	45	0.000	3204
2	MT_FT_MF	-283.1	102.6	36	0.000	-231
3	MT_FT_MF_HT	-255.5	47.3	32	0.040	-249
4	MT_FT_MF_CT	-248.6	33.6	24	0.091	-188
5	MT_FT_MF_HypT	-262.8	62.0	32	0.001	-234
6	MT_FT_MF_DT	-253.2	42.8	28	0.036	-216

Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

Notes: Model terms are as follows: M=Male partner's education, F=Female partner's education, T=Transition type, H=Homogamy; Hyp=Hypergamy; C=Crossing; D=Specific Homogamy (Both partners <=6 yrs. Educ or Both partners > 6)

Table 7: Homogamy, Crossing Parameters, Hypergamy Interaction Parameters for Educational Assortative Mating by Couples Type for Selected Models (N=10,894)

	Log Odds			Odds	
	β_M	β_{CU}	β_{CU}- β_M (1)	exp(β_M)	exp(β_{CU})
Panel A: Homogamy interaction parameters from model MU_FU_MF_HU					
Homogamy	2.13	1.87	-0.27	8.42	6.46
p-value	*0.000*	*0.000*	*0.000*		
Panel B: Homogamy Specific interaction parameters from model MU_FU_MF_DU					
Homogamy <7 yrs. education	3.28	2.86	-0.42	26.49	17.48
p-value	*0.000*	*0.000*	*0.000*		
Homogamy >=7 years education	1.01	0.82	-0.18	2.74	2.28
p-value	*0.000*	*0.000*	*0.009*		

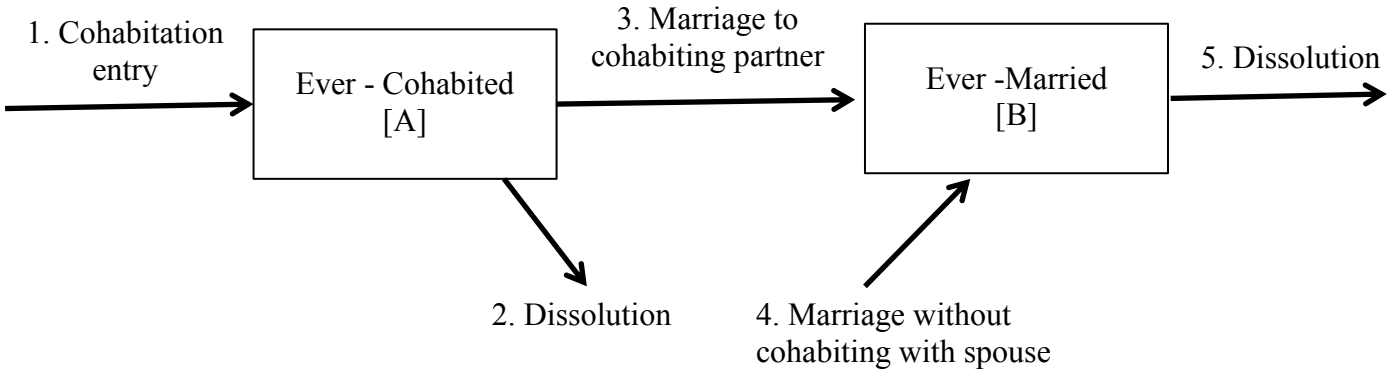
Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

Table 8: Homogamy Parameters for Educational Assortative Mating by Transition Status (N=10,441)

	Log Odds		Odds
	b_M	*p-value*	$\exp(b_M)$
Panel A: Homogamy parameters from model MT_FT_MF_HT			
1. Cohabitation entry and remained together	1.93	0.000	6.90
2. Cohabitation exit and separated	1.70	0.000	5.49
3. Cohabitation exit and married	2.13	0.000	8.44
4. Marriage entry with no previous cohabitation and remained together	2.18	0.000	8.82
5. Marriage Exit	1.99	0.000	7.32
b_3-b_2	0.43	0.000	1.54
b_1-b_2	0.23	0.000	1.26
b_3-b_4	-0.04	0.681	0.96
b_4-b_5	0.19	0.004	1.21

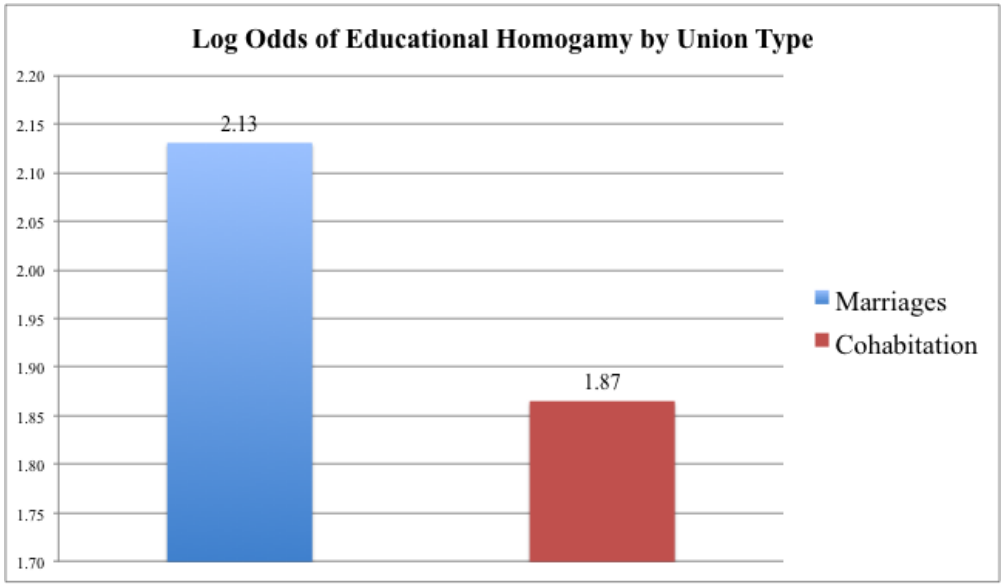
Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

Figure 1. Stock-and –Flow Diagram of Transitions Into and Out of Cohabitation and Marriage

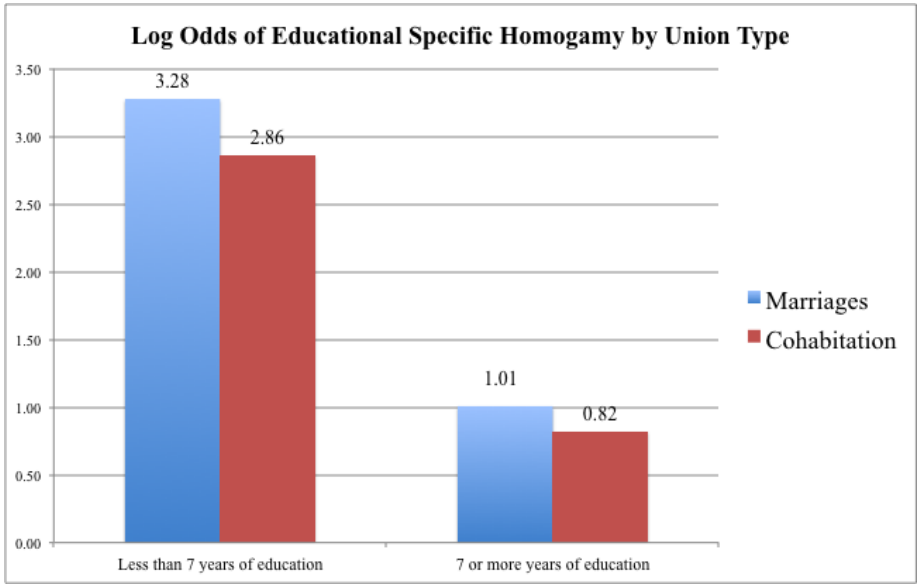


Source: Schwartz (2010)

Figure 2

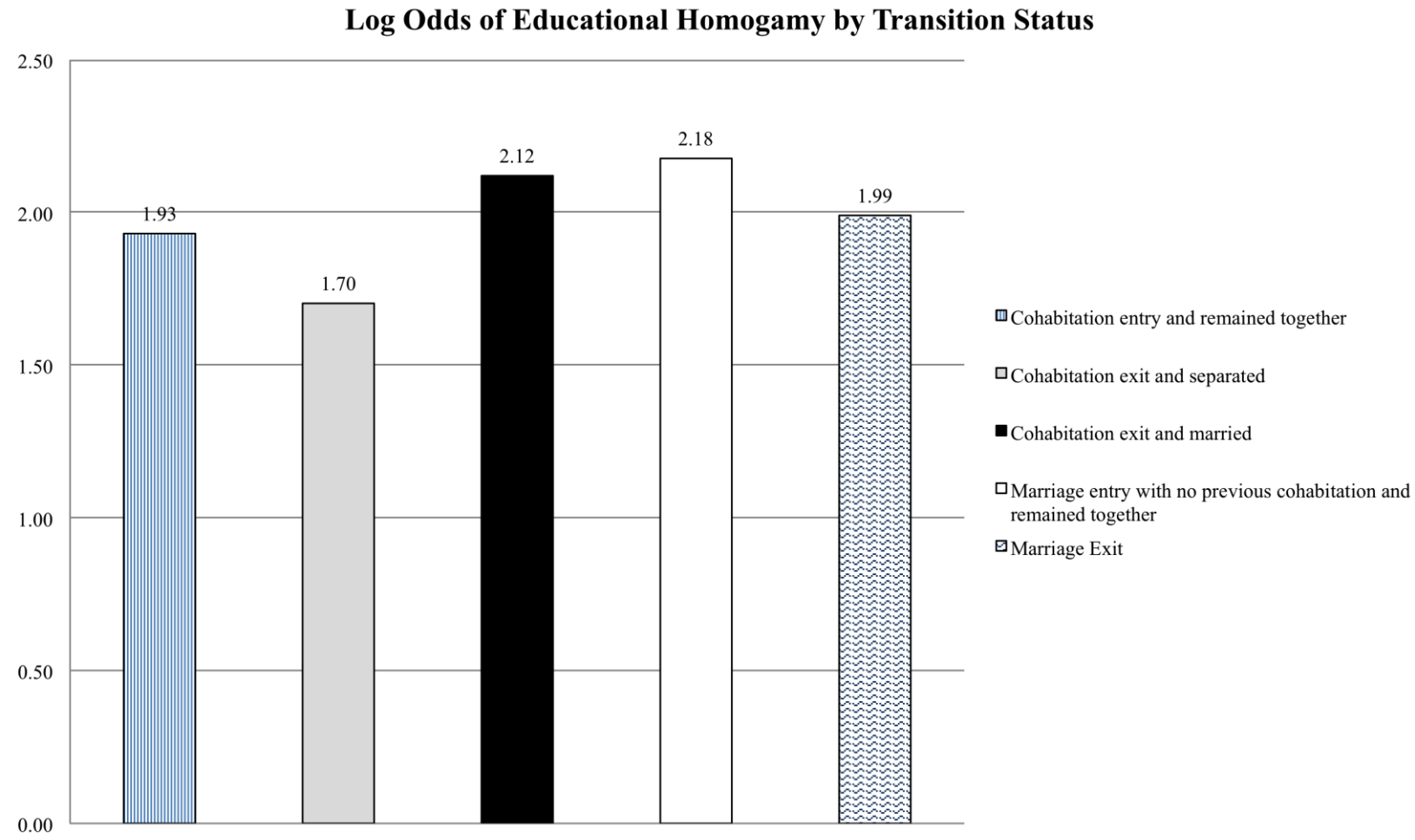


Source: Mexican Family Life Survey 2002, 2005, 2009/2010.



Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

Figure 3



Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

Appendix 1

AP1 Table 1: General overview of the MxFLS respondents

	%	N
Age eligible respondents (20-60)	100%	23,445
Ever in a union	78%	18,321
Never in a union	18%	4143
DK	4%	981
Age eligible respondents who have been at least 1 union	100%	18321
No restrospective history and age>25	15%	1955
No restrospective history and age<=25	4%	765
With restropective history	85%	15601
Drop cases where type of union is missing		58
Sample of respondents used to generate the sample of couples		16,308

Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

Appendix 2

AP2 Table1: Couple's Characteristics

Number of couples[(1)]	10,894	100%
Type of Union		
Marriage	7788	71%
Cohabitation	3106	29%
Type of couple		
1st - 1st	5581	51%
1st - Not 1st	619	6%
1st - DK	4694	43%

Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

(1) This number excludes couples in which for both partners the union is a second marriage.

Appendix 3

Supplementary Analysis

The analysis consists in estimating a series of log-linear models to explore differences in educational homogamy and hypergamy patterns by couple's type. In particular, I examine a contingency table that is produced by cross-classifying wife's education (*0-6, 7-9, 10-11, 12+*), husband's education (*0-6, 7-9, 10-11, 12+*), and couple's type (*1-1, 1-2, 1-DK*), which results in a 4 X 4 X 3 = 48 cell table.

Model specifications and fit statistics of selected models are provided in Table 1 of this appendix and parameter estimates of the preferred model are provided in Table 2. G^2 (likelihood ratios) and BIC statistics are provided to measure the goodness of fit of the models. I begin with the conditional independence model (MR_FR) that assumes that the association between husband's and wife's education is not associated. Then I add to the baseline model an interaction term that allows for unrestricted association between partners' education and constrains these partial association to be constant by couple's type. Finally, I add interactions terms between couple's type and homogamy, crossing, and hypergamy terms to the baseline model to investigate differences in educational assortative mating by couple's type. Based on the BIC statistics, the analysis indicates that Models 2 to 5 are better than the saturated model; however, Model 2 (MR_FR_MF), which has the most negative BIC statistic, is the best. Based on the G^2 statistics, Models 3 (MR_FR_MF_HR) and 4 (MR_FR_MF_CR) fit better the data compared to the saturated model. In sum, based on BIC we may conclude that there are not significant differences across couple's type. However, results from the G^2 suggest that there may be some differences. Next, I examine these differences for Model 3 since our main interest is the analysis of homogamy.

I present estimates of the interaction parameters of Models 3 in Table 2 of this appendix. Interaction parameters indicate that the log odds of homogamy (vs. heterogamy) for couple's types *1-2* and *1-DK* are significantly lower compared to type *1-1* ($p<.01$).

Based on these mixed results, my analytical sample will comprise the three types of couples (10,894 couples). Moreover, the main analysis in the paper will not include controls for couple's type in order to maintain a parsimonious formulation; however, whenever possible, I will conduct supplementary analyses to check if the results of the models change by including controls for couple's type.

A3 Table 1: Goodness of Fit of Selected Models of Educational Assortative Mating on Marriages and Consensual Unions. (N=10,894 couples)

	Model	LL	G^2	df	p	BIC
Models based in a 4 X 4 X 3 Contingency table (Males's educ X Female's Education X Couple's Type)						
0	MFR	-153.5	0.0	0	1.000	0
1	MR_FR	-2011.7	3716.5	27	0.000	3465
2	MR_FR_MF	-175.5	44.0	18	0.001	-123
3	MR_FR_MF_HR	-169.5	32.1	16	0.010	-117
4	MR_FR_MF_CR	-165.4	23.9	12	0.021	-88
5	MR_FR_MF_HypR	-173.5	40.0	16	0.001	-109

Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

Notes: Model terms are as follows: M=Male partner's education, F=Female partner's education, R=Couple type (First-First, First-Not First, First-DK), H=Homogamy; Hyp=Hypergamy; C=Crossing

AP3 Table 2: Homogamy Interaction Parameters with Couples' Type

	Log Odds	*p-value*
Homogamy X (First - First) Couple Type	(ref category)	
Homogamy X (First - Not First) Couple Type	-0.24	0.009
Homogamy X (First - DK) Couple type	-0.12	0.006

Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

Appendix 4

Education Level Bestguess

2002	2005	2009	Criteria	Education Bestguess
Educ2002	Missing	Educ2009	Educ2002=Educ2009	Educ(2009)
Missing	Educ2005	Educ2009	Educ2005=Educ2009	Educ(2009)
Educ2002	Educ2005	Missing	Age_2002>20(1), Educ2002=Educ2005	Educ(2009)
Educ2002	Missing	Missing	Age_2002>20[(1)]	Educ(2002)
Missing	Educ2005	Missing	Age_2002>20[(1)]	Educ(2005)
Missing	Missing	Educ2009		Educ(2009)
Educ2002(proxy Respondent)	Educ2005(direct Respondent)	Missing	Age_2002>20[(1) (2)]	Educ(2005)
Educ2002(direct Respondent)	Educ2005(direct Respondent)	Educ2009(direct Respondent)	Age_2002>20[(1) (2)]	Average(2002,2005,2009)
Educ2002(proxy Respondent)	Educ2005(direct Respondent)	Educ2009(direct Respondent)	Age_2002>20[(1) (2)]	Average(2005,2009)
Educ2002(direct Respondent)	Educ2005(proxy Respondent)	Educ2009(direct Respondent)	Age_2002>20[(1) (2)]	Average(2002,2009)
Educ2002(direct Respondent)	Educ2005(proxy Respondent)	Educ2009(proxy Respondent)	Age_2002>20[(1) (2)]	Educ(2005)
Educ2002(proxy Respondent)	Educ2005(direct Respondent)	Educ2009(proxy Respondent)	Age_2002>20[(1) (2)]	Educ(2005)
Educ2002(proxy Respondent)	Educ2005(proxy Respondent)	Educ2009(direct Respondent)	Direct Respondents' Answer is prefered	Educ(2009)
Educ2002(proxy Respondent)	Educ2005(proxy Respondent)	Educ2009(proxy Respondent)	Age_2002>20[(1) (2)]	Average(2002,2005,2009)
Educ2002	Educ2005	Educ2009	Age_2002<20; Educ2002>=Educ2005>=Educ2009	Educ(2009)
Educ2002	Missing	Educ2009	Age_2002<20; Educ2002>=Educ2009	Educ(2009)

[(1)] For respondents older than 20 in 2002, we assume that by 2002 they already achieve their maximum level of education

[(2)] Direct respondents are prefered to proxy respondents

Appendix 5

Supplementary Analysis

This analysis is conducted to evaluate if controlling for couple's type change the results obtained from log-linear models in the first part of the analysis in section 5 of the paper. I examine whether the association between wife's and husband's educational attainment varies by union type by estimating a series log-linear models to analyze a four-way table that is produced by cross-classifying wife's education (0-6, 7-9, 10-11, 12+), husband's education (0-6, 7-9, 10-11, 12+), union type (marriage, consensual union), and couple's type (*1-1* vs. others) which results in a 4 X 4 X 2 X 2 = 64 cell table.

I begin with a baseline model (MUT FUT MFT), which assumes no variation in the association between partners' education across union type. The formal model can be written as follows.

$$\log(f_{ijkl}) = \mu + \mu_i^M + \mu_j^F + \mu_k^U + \mu_l^T + \mu_{ik}^{MU} + \mu_{jk}^{FU} + \mu_{il}^{MT} + \mu_{jl}^{FT} + \mu_{kl}^{UT} + \mu_{ikl}^{MUT} + \mu_{jkl}^{FUT} + \mu_{ijl}^{MFT}$$

where M denotes husband's education (i=1,…,4), F is wife's education (j=1,…,4), U is type of union (k=1,2), couple's type (l=1,2) and f_{ijkl} is the expected number of unions between husbands in education category i and wives in education category j , union type k, and couple's type l. I add to the baseline model homogamy, hypergamy, crossing, and diagonal terms to investigate differences in educational assortative mating by union type. In general our find are similar from the models based on a three way table, where we do not control for couple's type.

AP5 Table 1: Goodness of Fit of Selected Models of Educational Assortative Mating on Marriages and Consensual Unions. (N=10,894 couples)

	Model	LL	G^2	df	p	BIC
Panel A: Models based in a 4 X 4 X 2 X 2 Contingency table (Males's educ X Female's Education X Type of Union X Couple's Type)						
0	MFUT	-201.7	0.0	0	1.000	0.0
1	MUT_FUT_MFT	-233.4	63.4	18	0.000	-103.9
2	MUT_FUT_MFT_HU	-219.9	36.4	17	0.004	-121.7
3	MUT_FUT_MFT_CU	-213.5	23.7	15	0.070	-115.7
4	MUT_FUT_MFT_HypU	-221.3	39.2	17	0.002	-118.8
5	MUT_FUT_MFT_DU	-213.5	23.6	14	0.051	-106.5

Source: Mexican Family Life Survey 2002, 2005, 2009/2010.

Notes: Model terms are as follows: M=Male partner's education, F=Female partner's education, U=Union type, T: Couple's Type; H=Homogamy; Hyp=Hypergamy; C=Crossing; D=Diagonal (Specific Homogamy)

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