Assortative Mating in Russia, 1993 and 2007: Forms, Changes, and Implications for Inequality

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INTRODUCTION

The rigidity of social hierarchies in societies may be reinforced in many ways, including through a high degree of status inheritance from one generation to the next, by limited opportunities for social mobility within generations, and by social and residential segregation. Classic studies of intergenerational mobility have focused on the inheritance of occupational status from fathers to sons to measure openness (e.g., Blau and Duncan 1967; Featherman and Hauser 1978) whereas others have examined mobility chances within the life course (e.g., Kerckhoff 1993; Spilerman 1977). Marriage patterns provide another measure of openness—societies in which many marriages cross social boundaries can be considered relatively open compared with those in which few marriages cross social boundaries (Ultee and Luijkx 1990; Kalmijn 1994). If underlying status hierarchies exist in societies, then multiple measures of social relations between groups should uncover similar social boundaries and a high degree of correlation between these different forms of hierarchies indicates a high degree of status "crystallization" (Grusky 1994).

Comparative research on assortative mating suggests that the degree of mobility and inequality in societies may also affect who marries whom. For example, Fernández, Guner, and Knowles (2005) hypothesize that countries with higher economic inequality will have higher levels of assortative mating because, as economic inequality increases so do the costs of "marrying down" and the social distance between socio-economic groups. Empirical evidence largely confirms this claim; countries with greater economic inequality across educational groups tend to have more marital sorting on education (Dahan and Gaviria 1999; Fernández, et al. 2005; Torche forthcoming). Historical variation in inequality within counties may be associated with changes in assortative mating. Mare and Schwartz (2006) find that variation in inequality in the United States from 1940 to 2003 explains a substantial portion of changes in educational assortative mating over the same period.

This paper examines the associations between husbands' and wives' characteristics in Russia using nationally-representative surveys conducted in 1993 and 2007. The timing of these two surveys permits to assess whether the associations between spouses' characteristics have changed following Russia's transition from a state socialist to a market-based economy. The first survey was conducted just over one year following the introduction of radical reforms that dismantled the Soviet-era economy in January 1992. Although it would be ideal to have a pre-transition baseline, the 1993 can reasonably treated as representing the association between spouses' characteristics that prevailed at the time of the Soviet collapse, since it is unlikely that major changes would have occurred in the space of one year.

Following the collapse of the Soviet Union, earnings inequality increased sharply in Russia, along with unemployment (Gerber and Hout 1998). At the same time, the relationship between parental origins and occupational attainment also increased, suggesting a tightening up of the social mobility regime (Gerber and Hout 2004). These developments would give high-status individuals greater incentive to marry other high status individuals and, once married, they have greater disincentive to divorce. Thus, we would expect a general pattern of increasing homogamy, particularly at the higher end of the educational and earnings distributions. On the other hand, Katrnak et al. (2006) found that from 1988 to 2000 educational homogamy remained stable in Poland and the Czech Republic, though it increased slightly in Hungary and substantially in Slovakia, suggesting that a shift in marriage behavior in response to changing economic conditions cannot be assumed.

We estimate the associations between spouses of two different characteristics: educational attainment and earnings. For each set of analyses, we apply conventional log-linear models to measure the associations and test for change over several different dimensions of time (e.g. Mare 1991; Smits et al. 1998; Raymo and Xie 2000; Schwartz and Mare 2005). Although there is a large literature on post-socialist stratification and a growing one on trends in family formation in post-socialist societies (Avdeev and Monnier 2000; Scherbov and Van Viannen 2001; Kalmijn 2007; Gerber and Berman forthcoming), we know of only one study of assortative mating in post-socialist contexts (Katrnak et al. 2006), and that study did not include Russia. Thus, our results will shed new light on an important intersection between demographic behavior and inequality in a key post-socialist country.

THEORETICAL EXPECTATIONS

We expect the association between husbands' and wives' education and earnings to increase in Russia as a result of the economic transition from state socialism to a market-based economy and also due to long-term trends in marriage and divorce. Following the collapse of the Soviet Union at the end of 1991, the Russian government introduced a sweeping set of reforms designed to undo state socialist institutions and establish a market economy: they liberalized prices, currency exchange, and trade, ended state planning and centralized wage controls, and initiated a program of relatively rapid privatization of state owned enterprises. These measures led to sharp economic contraction, declining real wages, growing unemployment and wage arrears, and substantial increases in inequality for most of the 1990s. The economy bottomed out at the end of the 1998 when the government defaulted on short-term high interest bonds and another round of hyper inflation ensued. From 1999 through 2007, however, the Russian economy grew robustly, due to high prices for Russia's energy exports on the global market and, to some extent, import substitution and improved efficiency of domestic production.

In contrast to the Soviet era, when chronic shortages of consumer goods and a relatively flat income distribution diminished the value of cash, Russians had greater incentives to "marry well" socio-economically in the post-Soviet era. During the chaos and crisis of the 1990s the income of every household member became all the more important, because households now needed a steady flow of cash to pay expenses. Moreover, if households could generate steady income, they could now buy consumer goods and services and thus improve their standard of living. Economic life was transformed from a secure, "low-stakes" game where most people were assured a basic minimum to a risky, high-stakes game where many faced possible destitutions while others could reap tremendous windfalls. It follows from this transformation of the economic environment that economic considerations probably played a greater role in shaping whether and to whom Russians decided to marry during the post-Soviet era than they did in the Soviet era. In addition, we would expect economic incentives to reduce the rate of divorce among homogamous couples at the top of the education and earnings distributions.

Another relevant consideration is the long-term decline in marriage rates that Russia began to experience some time in the 1980s (Hoem et al. 2007; Gerber and Berman forthcoming). Through most of the post-War era, the norm in Russia was early and nearly universal marriage: the average age at first marriage actually declined by 2.5 for both men and women between 1960 and 1980 (Avdeev and Monnier 2000). Recent analyses show that marriage entry rates began declining at least as early as 1985, and continued to do so at least through the 1990s. Meanwhile, non-marital cohabitation became more common. Some demographers link these tendencies to a broader change in norms and values similar to those associated with the "second demographic transition" in the West (Zakharov 1999; Lesthaeghe and Surkyn 2002). Others attribute declining marriage and fertility in contemporary Russia and other post-socialist countries to the economic crises and uncertainty of recent decades (Eberstadt 1994; Heleniak 1995). Whatever their cause, declining marriage rates and delays in marriage imply that Russians became more selective about whom to marry starting in the 1980s. It stands to reason that increased selectivity should be associated with increasing association between husbands' and wives' characteristics.

In addition, the divorce rate in Russia appears to have grown markedly during the 1990s as well, though it was already high by international standards in the 1980s (Zakharov 1999). If, like in other countries, heterogamous marriages are more likely to end in divorce in Russia, the increased divorce rate would tend to increase the level of homogamy in existing marriages. We have not seen any studies documenting the relationship between homogamy and the odds of union dissolution in Russia. But we would expect that the typical negative relationship would apply in Russia for reasons of both economic and "cultural" compatibility. If anything, the negative association should grow in strength during the post-Soviet era due to the incentives and pressures for all household members to maintain steady employment and earn as much income as possible.

On the other hand, we also have grounds to anticipate a growing tendency for high-earning men to marry and stay married to low-earning or non-earning women. In the Soviet times Russian women had extremely high rates of labor force participation, due to chronic labor shortages and state support for women's employment in the form of subsidized child care and maternity leave (Gerber and Mayorova 2006). With the shift from a supply-constrained to a demand-constrained labor market, it is quite possible that women were more likely to opt out of work in order to embrace the traditional role of homemaker. Moreover, although many Russian couples no doubt needed both partners to earn money in order to survive, a small number of well-placed or fortunate Russians were able to take advantage of the new opportunities and secure sufficient incomes to support their spouse. Thus, we may observe a growing tendency for high-earning men to be married to low-earning or non-earning women in the post-Soviet era.

DATA

Our data come from two surveys. The first survey is the Russian module of the comparative study, "Social Stratification in Eastern Europe after 1989: General Population Survey" (Treiman 1994). A probability sample drawn using standard multi-stage methods of 5002 Russian adults was surveyed in February-May 1993. The second survey was part of the bi-monthly "Monitoring" omnibus conducted by the Levada Center in Moscow, also using standard multi-stage sampling methods. A special battery of questions obtaining information about the education, ethnicity, and labor market activity of the respondents' spouses was included in the January and March 2007 renditions of this survey, and the total number of adults surveyed was 4814.

Both surveys ascertained the respondent's age, marital status, employment status, education, occupation, and earnings. Also, if the respondent was either married or in a cohabiting relationship at the time of the survey, the questionnaire obtained the same information in regard to the respondent's partner. Excluding the single respondents yields 3206 couples from the 1993 survey and 2411 from the 2007 survey. For explained below, we further restricted analyses to couples where the wife was 18-45 at the time of the survey. Within this restricted sample of couples, we lost an additional 100 who were missing data on the education of one or the other partner. The final sample sizes were 1865 couples in 1993, 1262 in 2007, and 3127 total. These samples are relatively small for analyses of assortative mating, particularly because we further partition the sample of each survey into two age groups. With statistical power at a premium, we retained cohabiting couples in our analyses. They represent about 3.8% of the couples in 1993 and 11.2% in 2007, which reflects the increasing popularity of non-marital cohabiting relationships in Russia in recent decades (Gerber and Berman forthcoming). This could bias our results if cohabitors differ systematically from married couples in terms of the associations between partners' characteristics, which they typically do in other countries. However, our preliminary tests revealed no evidence of such systematic differences. This could well reflect the small number of cohabitors (71 in 1993 and 141 in 2007), which limits the power of statistical tests for distinctions by marital status. In any case, though, if the internationally typical pattern holds then the inclusion of cohabitors would tend to deflate estimates of increasing association between partner's characteristics over time due to the greater preponderance of cohabitors in the latter period.

MEASURES AND ANALYTICAL APPROACH

We measure education using a 5-category version of the CASMIN schema, as follows:

1. Less than secondary schooling;
2. Vocational training without a secondary degree;
3. General secondary degree;
4. Secondary degree plus vocational or technical training;
5. At least 2 years of university (or more).

Readers familiar with the Soviet and Russian educational systems will note that these categories are less than ideal. The most significant drawback is that category 4 combines two fundamentally different types of education. Lower vocational schooling (most often in institutions known as "PTUs") typically imparted manual skills or very low-level technical training, mainly to young males. They prepared students for careers as skilled manual workers or routine service technicians. For much of the Soviet period, students in these institutions did not receive secondary degrees; however, following reforms in the late 1960s many of them were given formal secondary diplomas along with their vocational certificates. By all accounts, these secondary diplomas meant little as credentials in the labor market, and the combination of PTU training with a secondary degree should really be treated as no different from category 2, vocational training without a secondary degree (see Gerber and Hout 1995; Gerber 2000). In contrast, "specialized secondary" education (which takes place in "SSUZes" or *tekhnikumy*) provides not only a respectable secondary diploma but also more advanced technical or para-professional training, mainly to females. These institutions produce nurses, librarians, and laboratory technicians. This type of training is rightly viewed as somewhat above a general secondary degree in terms of status and earnings potential, but also below a university diploma.

Unfortunately, the 1993 survey instrument did not distinguish between these two types of education, and therefore both category 4 and category 2 are problematic. Most of the husbands and even more of wives classified in category 4 are specialized secondary graduates who belong there, but some really should have been classified in category 2. We suspect that marriages where one partner has lower vocational and the other specialized secondary (which appear incorrectly as homogamous in our classification) are relatively rarer than marriages where both partners have lower vocational but one of them also has a secondary degree (which appear incorrectly as heterogamous in our classification), so the net effect of the problematic categories is to understate the level of educational homogamy among Russian couples. But we see no reason why the degree of bias from these categories changed between 1993 and 2007, so we believe the data nonetheless are suitable for assessing change over time in educational assortative mating. The 2007 data provide less aggregated educational classifications of both respondent and partner. In the next phase of our analysis we will assess how the use of the 1993 survey education categories affects our results by comparing results using alternative codings of the 2007 data only. If we find that the classification scheme imposed by the 1993 categories produces substantial distortions, we will either find new data from the early 1990s or we will use imputation techniques to re-classify those who fall in category 4 in the 1993 survey.

To measure assortative mating based on earnings, we calculated separate male and female earnings quintile cut-points for 1993 and 2007 using all the employed respondents with non-zero earnings in each respective survey. We then assigned husbands and wives to earnings quintiles. An important advantage of using methods for categorical data analysis as opposed to simply examining the correlations between spouses' earnings is that we are able to incorporate non-earners. Thus, our earnings analyses include a sixth category for "non-earners" in addition to the five earnings quintiles for both husbands and wives.

In order to systematically test different scenarios whereby assortative mating might vary with time, we analyze two age groups (using the wife's age to define age group) in each period: young (ages 18-31) and old (ages 32-45). Table 1 helps illustrate the rationale for dividing the samples in this fashion. The fourteen-year window corresponds to the years between the two surveys, and this approach yields three distinct cohorts of wives. Wives born 1975-1988 are a "post-transition" cohort surveyed only in 2007; they turned 18 (and thus became legally eligible to marry) *after* 1992, and thus we can be reasonably certain that they got married during the post-transition era, so they only experienced post-transition conditions of marriage and divorce behavior. Wives born 1961-1974 were surveyed both in 1993 and in 2007. This "transition cohort" turned 18 in 1979-1992, when the decline in Russia's age-specific marriage rates began (Gerber and Berman forthcoming). Some of them who were surveyed in 2007, at which point there were ages 32-45, may have entered their current relationships during the post-transition era, while almost all of those who were married when surveyed in 1993 would have gotten married prior to the Soviet collapse. Thus, the marriages of the transition cohort observed in 2007 are the result of both pre-transition and post-transition processes. We proceed as if the oldest cohort, born 1947-1960, was observed only in 1993. In fact, this "pre-transition" cohort is represented in the 2007 survey. But at that point in time the wives were aged 46-60 and mortality bias is a serious concern, particularly since male life expectancy in Russia hovered around 58 years for much of the post-transition era. Moreover, by omitting the pre-transition cohort's marriages extant in 2007 from the analysis, we are certain that all their marriages we analyze took place in the pre-transition era. Thus, we treat the 1947-1960 as an "exiting" cohort, observed only in 1993.

Changing marriage and divorce behavior can produce changes in measures of the association between husband's and wife's characters (which we hereafter refer to as the "HW association") across three dimensions of time: age, period, and cohort. Consider our situation where we have a measure of HW association for each combination of period (Y_k, with k=1,2) and age (A_l, with l=1,2), θ_{kl}. A simple *period effect* (absent age effects) implies that $\theta_{11}/\theta_{21} = \theta_{12}/\theta_{22} \neq 1$, while $\theta_{11}/\theta_{12} = \theta_{21}/\theta_{22} = 1$. That is, the association varies proportionately across period for each age group, but does not vary by age group within each period. A simple *age effect* implies the opposite: $\theta_{11}/\theta_{21} = \theta_{12}/\theta_{22} = 1$ and $\theta_{11}/\theta_{12} = \theta_{21}/\theta_{22} \neq 1$ (homogamy varies by age group within period, which may occur due to the relationship between homogamy and divorce, but not across period within age groups.) A *period + age* pattern is one with additive variation by period and age, but no interaction: $\theta_{11}/\theta_{21} = \theta_{12}/\theta_{22} \neq 1$ and $\theta_{11}/\theta_{12} = \theta_{21}/\theta_{22} \neq 1$. Note that in this case there is proportional variation across both dimensions. Of course, *cohort variation* implies that there is an interaction between period and age effects. This can take a variety of forms. One is simple cohort replacement: $\theta_{12} \neq (\theta_{11} = \theta_{22}) \neq \theta_{21}$. The younger cohort in year 1 is the same as the older cohort in year 2 and has a distinctive level of homogamy from the other two cohorts, each of which is observed only once). This pattern might be mistaken for a period effect if we only consider period and not age. A full interaction between period and age implies different effects of period by age and different effects of age by period: $\theta_{11} \neq \theta_{21} \neq \theta_{12} \neq \theta_{22}$.

By setting up the age group by period classification the way we do, we are able to test for these different forms of change over time in the HW association. We provide more details about particular specifications below. We note immediately, however, that we only consider period variation when it comes to modeling earnings homogamy, because we would not expect cohort effects to come into play as much with respect to earnings. Compared to education, which is usually (though not always) fixed for life prior to family formation, earnings are more fluid and flexible throughout the life cycle. Thus, cohort-specific patterns of partner selection on the basis of earnings potential are probably not the predominant factor shaping period variation in earnings homogamy, especially in light of sharp changes in macro-economic environment across the two periods under consideration.

DESCRIPTIVE RESULTS

Education

Table 2 shows the joint distributions of husbands' and wives' educations by year and age group. The row marginals attest to the upgrading of educational attainment and also to the strong positive effect of higher education on marriage entry among Russians during the 1980s and 1990s (Gerber and Berman forthcoming). These patterns are somewhat less evident for the column marginals (male distributions) because in Russia, as elsewhere, women have surpassed men in the attainment of university degrees in recent decades. These data also capture the small numbers of Russians who do not obtain a secondary degree and the disproportionately male character of lower vocational schooling (see Gerber 2000). The problematic nature of category 4 is evident in the approximate gender parity of the category, which should exhibit a disproportionate share of women.

For our purposes, the key question is whether the proportions of educationally homogamous marriages vary across the four sub-tables in Table 2. We plot these proportions in Figure 1. This figure suggests that the relationship between time and educational homogamy is complex: For both age groups, there is more homogamy in 2007 than in 1993, but the difference is actually most pronounced for the older age group. There appears to be no variation by age in 1993, but considerable variation by age in 2007, with the older group more homogamous. Marriages by the "transition cohort" apparently became substantially more homogamous between 1993 and 2007, which could reflect three tendencies: 1) negative association between homogamy and union dissolution; 2) a larger proportion of post-transition (and, thus, based on our theory, more homogamous) unions for this cohort in 2007 than in 1993 (when, in effect, none of the unions were formed in the transition era); and 3) a tendency for marriages initiated at older ages (as those initiated by the transition cohort during the post-transition era would have tended to be) to be more homogamous than marriages initiated at younger ages. Of course, these observations are based only on scrutiny of Figure 1. Moreover, they say nothing of off-diagonal association between husbands' and wives' education. To assess the apparent trends in homogamy and also incorporate off-diagonal association, we turn in the next section to log-linear models of the HWYA cross-classification.

Earnings

Figure 2 shows changes in the simple correlation between husbands' and wives' earnings by wives' age and survey year. Consistent with the hypothesis that marriage patterns should become more stratified after the market transition, the correlation between husbands' and wives' earnings increased between 1993 and 2007 for both younger and older wives. The increase for older wives was quite dramatic. In preparing figure 2 we coded non-earners as having zero earnings, but it is often instructive to consider the association among spouses' earnings for dual-earning couples separately from the issue of the relationship between the earnings of one spouse and the probability that the other spouse is a non-earner. For each category of husbands' earnings, Figure 3 shows the wives' average earnings quintile among wives who had non-zero annual earnings. For both years, husbands who earned more tended to have wives who earned more, except for non-working husbands who had slightly higher earning wives than low-earning husbands. What clearly stands out in Figure 3, however, is that the relationship between dual-earner couples' earnings grew between 1993 and 2007: the 1993 series is flatter. Low-earning husbands had lower-earning wives in 2007 than in 1993 and high-earning husbands had higher-earning wives.

Increases in the correlation between spouses' earnings may arise from changes in the relationship between husbands' earnings and the likelihood that wives work and/or from increases in the correlation between spouses' earnings among couples in which both partners. Figure 4 shows the relationship between husbands' economic position (earnings quintile) and the likelihood that wives work (had non-zero annual earnings) by year. It shows that, regardless of husbands' earnings, wives were *less* likely to work in 2007 than in 1993. This is consistent with our expectations based on the observation that female labor force participation was exceptionally high during the Soviet period. Figure 4 also shows that the relationship between husbands' earnings and the likelihood that wives work follows an inverted "U"-shape in both years. Wives of low- and high- husbands are less likely to work than wives of middle-earning husbands. Descriptively, there is little evidence of a major shift in the relationship between husbands' earnings and the likelihood that wives work. There is a suggestion that the relationship between husbands' earnings and the likelihood that wives work is positive somewhat farther into the distribution of husbands' earnings, which would be consistent with Oppenheimer's (1994) hypothesis that men increasingly value women's earnings in marriage, but this change is not dramatic. Again, we turn to our log-linear models to evaluate whether these changes are statistically significant.

LOG-LINEAR MODEL RESULTS

Education

Our basic approach involves modeling the four-way association between husband's education (H), wives' (W), year of survey (Y), and age group (A). In all models we fit the three-way marginals {HYA} and {WYA} in order to partial out changes across period and age group in the distributions of husbands' and wives' characteristics. Our modeling strategy involved two objectives: identifying an optimal parameterization of the HW association and testing different models of variation in the parameters shaping that association across Y and A. We determined that the best fitting specification of the HW association in these Russian data is a "hybrid RCII" model. The model specifies the logged frequencies in the HWYA table as an additive function of {HYA}, {WYA}, and an expression parameterizing the HW association and its variation over time as follows: $\theta_{kl}\mu_i\nu_j+\delta_{1kl}D_{1ij}+\delta_{2kl}D_{2ij}$. The first element in the expression is the familiar RCII association parameterization: θ_{kl} is a multiplicative association parameter and μ_i and ν_j denote, respectively, scores for (wife's education) row *i* and (husband's education) column *j* estimated from the data subject to the identifying constraints that both sets of scores sum to zero and have a variance of 1. We adopt the additional conventional constraint that $\mu_i=\nu_j$, since we have no a priori reason to suspect that the "social distance" between education categories differs substantively for men and women. (In fact, we tested models that relax the equality constraints across dimensions and found consistent support for the constraints). The second two elements in the expressions are two "homogamy" effects capturing the inflated tendency for individuals to marry those with the same education above and beyond the association captured by the RCII-type association between H and W. The optimal specification included two diagonal terms: D_1 equals 1 for i=j and j<5, and D_2 equals 1 for i=j=5. That is, we found a distinctively strong tendency for those with at least some college to marry homogamously. Note that although we constrain the estimated row/column scores to be invariant over Y and A (an assumption we tested and found support for), we allow the three other parameters that shape the HW association, θ, δ_1, and δ_2, to vary by both Y and A (as implied by the *k* and *l* subscripts).

The challenge we face is how to best specify the variations in these parameters across Y and A in a manner that maximizes parsimony and model fit. We initially tested models that constrained the changes in the three parameters to be proportional across Y and/or A (the conventional "unidiff" pattern), but we found the proportionality constraint never fit the data, so we do not report these models. Instead, we adopted a piecemeal approach, first testing for change over time in δ, then change in θ, then change in both. We focused on seven different specifications of change across Y and A: the period, age, period + age, cohort replacement, and full interaction patterns described above, and also linearly constrained cohort change and change for only the post-transition cohort.

Table 3 provides fit statistics for the independence model, three "homogamy only" models (which specify the entire HW association as along the diagonal with, respectively, one, two, and five diagonals parameters), and a series of hybrid RCII models. We also tested three other specifications of the HW association: the "crossings" model, quasi-symmetry, and full association. None of these performed as well as the hybrid RCII model, so we relegate these results to the Appendix for interested readers.

Our dual aim of maximizing both parsimony and model fit dictates that we consider both the BIC statistic and the overall fit of competing models. Following Wong's (1994) recommendation based on his Monte Carlo study of BIC and other measures of model fit, we treat differences in BIC of fewer than 5 points as indeterminate, and in those cases we base our model selection on the conventional likelihood-ratio test (assuming the competing models are nested). To compare non-nested models we rely on BIC alone.

Not surprisingly, the independence model fits the data poorly (model 1). Specifying the HW association using only one, two, and five diagonals parameters (models 2-4) improves fit considerably, but still leaves a large amount of unexplained HW association: clearly there is substantial off-diagonal association between husbands' and wives' education in these Russian data. Models 6-8 incorporate RCII association into models 2-4. In each case, the hybrid RCII model fits much better than the corresponding diagonals-only model. Based on BIC, the optimal specification includes only a single diagonal parameter (for all five diagonal cells). Therefore, in the next set of models (9-22) we adopt the RCII+HMG1 specification and test whether the diagonal parameter and/or theta vary by Y and A. (None of the models up to this point incorporate a three-way interaction involving HW.)

Several results from models 9-22 merit discussion. First, the "age effect" and "post-transition cohort effect only" models (10, 13, 17, and 20) do not fit the data, as is consistently the case for all the specifications we tested. Second, these models provide little evidence of significant variation in the association parameter, θ. Third, of the one-df specifications the best fitting model is the "period effect" model (9 and 16). This is also typical for other specifications of the HW association. In fact, according to the BIC criterion the best fitting RCII+HMG1 model is model 9, which allows only the diagonal parameter to vary, and only by period. Similarly, model 16 is the best fitting model among those that allow both θ and δ to interact with Y and A. However, neither model 9 nor model 16 fit the data using the conventional deviance chi-square test. Moreover, the BIC statistic is indeterminate with respect to the comparison of models 15 and 9, and the likelihood ratio test would have us prefer the full interaction specification of the change in δ.

One possible solution to this quandary is to consider models incorporating two diagonals parameters rather than a single one. Although the single diagonals parameter provides the optimal fit when we constrain the HW association to be constant over Y and A (model 7 vs. 6), that does not necessarily mean that it provides the optimal fit when we allow the HW association to vary. The unique diagonal parameter for college educated husband and wife (D_2) provides more flexibility to capture complex variation across period and age. Accordingly, we test three way interactions involving HW using the RCII+HMG2 specification (models 23-42). Here, too, we start by allowing only the (now two) diagonals parameters to vary (23-29), then we incorporate variation of θ as well (30-36).

Again we find that the best fitting pattern according to BIC is one of variation by Y only (models 23 and 30). Also, because BIC provides no grounds for choosing between 23 and 30, but model 30 fits better than model 23 using the conventional likelihood-ratio test, we conclude that all three association parameters (θ, δ_1, and δ_2) vary by period. Model 30 not only provides an equivalent BIC to model 9, unlike model 9 it also fits the data (though barely) using the conventional standard of $p>.05$. Before choosing model 30 as our preferred model, we noted that models 35 and 36 actually fit the data somewhat better than model 30 using the standard chi-square test. Neither of the latter models is very parsimonious, and so BIC clearly prefers model 30. However, their superior fit using the conventional approach suggested to us that we might be able to improve on Model 30 in a more parsimonious fashion. Before attempting to do so, we ruled out models that allowed θ but not δ_1 or δ_2 to vary by Y and YA (models 37 and 38).

The most obvious reason why models 35 and 36 would improve the fit compared to model 30 but not enough to merit the loss of additional degrees of freedom is that *either* θ or δ_1 and δ_2 vary by both period and age, while the other varies only by period. We tested three such scenarios in models 39-41. Models 39 and 40 specify period + age variation for, respectively, the diagonals and theta. Neither improves upon model 30, implying that we need a cohort effect (interaction between period and age) if are to do so. Model 41 allows theta to vary interactively with both Y and A (this is the more parsimonious of our options because there is only one θ but two δ.) Model 41 does fit the data better than model 30 using the chi-square test, but BIC clearly prefers model 30. Inspection of the parameter estimates for θ_{kl} suggested that $\theta_{11} = \theta_{12}$, i.e. there was no variation by age in 1993. Imposing this constraint, which in fact parameterizes the complex pattern evident in Figure 1, yielded model 42. Model 42 has an equivalent BIC to model 30, but it provides a superior fit to the data using the likelihood ratio test. It provides a rather satisfactory overall fit to the data (p=.136), given that it uses only 10 of the 64 degrees of freedom available for specifying the HW association and its variation across Y and A.

Table 4 shows the (time-invariant) estimated row/column scores and the parameter values for each period and age group implied by model 42, our preferred model. But to understand how the HW association changes over time, it is necessary to consider the combined effects of the three association patterns: analyzing on in isolation of the others can be misleading. To illustrate how the HW association fluctuates by period and age, we calculated the cell-specific shifts in log-frequencies (net of the three-way marginals controlled in all models) implied by model 42 (Table 5). To do this, we simply solved for the expression on p.9 using the estimated parameter values.

The cell entries in Table 5 have a straightforward interpretation: they represent the excess or deficit in logged frequencies found in each cell relative to the expected log frequencies taking on the HYA and WYA marginals into account. As we would certainly anticipate, HW association is positive along the diagonals, and especially so at the two extremes. In fact, in 1993 the positive off diagonal association at the extremes (categories 1 and 2, 4 and 5), is equal to or greater in magnitude than diagonal association at the intermediate education levels. This could, we note, reflect the problematic nature of the education categories we discussed earlier. In any event, our model also captures the expected negative association between the highest and lowest categories, which pertains not only to the extremes but also to similar contrasts.

As our model implied, we find no variation by age in the HW association in 1993. For both age groups the HW association increased between 1993 and 2007. For the younger ages the increasing association was most pronounced in the form of increased homogamy for all but the college educated. In fact, college educated 18-31 year old women were no more likely to be homogamous (relative to what the HYA and WYA marginals imply) in 2007 than they were in 1993. Apart from increased homogamy among those with less than college, there is also a clear pattern of increasing off-diagonal association, particularly at the extremes. Most striking of all, we observe the strongest HW association for the transition cohort in 2007. Their levels of homogamy are only slightly higher than those of the post-transition cohort, except for the college educated, who exhibit markedly higher homogamy. They also have exhibit stronger off diagonal association.

Bear in mind that the transition cohort was also observed in 1993: panel C and panel A represent the same cohort of Russians examined at two different points in time. As we suggested above, the dramatic increase in the observed HW association probably reflects a combination of three factors: 1) negative association between homogamy and union dissolution (whose impact is exacerbated by growing divorce rates); 2) a larger proportion of *post-transition* (and, thus, based on our theory, more homogamous) unions for this cohort in 2007 than in 1993 (when, in effect, none of the unions were formed in the transition era); and 3) a tendency for marriages initiated at older ages (as those initiated by the transition cohort *during the post-transition era* would have tended to be) to be more homogamous than marriages initiated at younger ages. In the next phase of our analyses, we will attempt to tease out these different sources of increasing homogamy over time for the transition cohort using information from the 2007 data on the timing of extant marriages (which is lacking in the 1993 data).

Earnings

Table 6 shows the fit statistics for log-linear models of variation in the association between husbands' and wives' earnings in 1993 and 2007. Model 1 is the baseline model and assumes that there is no relationship between husbands' and wives' earnings. This model fits the data poorly relative to other models. Next, Model 2 parameterizes the association between husbands' and wives' earnings with a linear-by-linear association term, which is conceptually similar to a correlation coefficient. Here, the linear-by-linear association term is $\beta x_i y_j$ where x_i and y_j are the median earnings of husbands in earnings category i and wives in earnings category j in each year. This model is an improvement over the baseline model. Model 2 summarizes the association for all couples with a single parameter, but the association between husbands' earnings and wives earnings for wives who do not work may differ substantially from the association for dual-earners. To test this hypothesis, we add a time-invariant term for the association between husbands' earnings quintile and the odds that wives work (Model 3), which significantly improves the fit of the model.

Is there evidence that these association have changed between 1993 and 2007? Model 4 allows the linear-by-linear association term to vary across year, and the fit statistics indicate that these terms significantly improve the fit of the model. By contrast, allowing the relationship between husbands' earnings and the odds that wives work to vary over time does not improve the fit of the model, which is consistent with the similarity of the relationship between husbands' earnings and the likelihood that wives work in 1993 and 2007 shown in Figure 4.

Model 6 adds a "hypogamy" term to Model 4, which is equal to 1 if wives are in a higher earnings quintile than their husbands and 0 if they are not. We add this term to test whether there is evidence of increasing gender symmetry in the relationship between husbands' and wives' earnings. The hypogamy term improves the fit of the model, but there is no evidence of a change in the odds hypogamy between 1993 and 2007 (Model 7). Finally, Model 8 tests whether the association between high earning couples differs from the rest of the distribution. But this term does not improve the fit of the model, although there is some evidence that the association between high-earning couples changed differently from that of other couples across the two years (Model 9). However, by the BIC, Model 9 fits the data worse than the more parsimonious Model 6. Thus, our preferred model is Model 6, which allows the general association to vary over time, but in which the relationship between husbands' earnings and the likelihood that wives work are constant as are sex asymmetries in the association.

Table 7 shows estimates of the earnings association parameters from Model 6. It shows that the linear-by-linear association between husbands' and wives' earnings increased substantially between 1993 and 2007. It also shows that the log odds that a wife has no annual earnings increase monotonically with husbands' earnings position. These findings differ somewhat from the descriptive statistics shown in Figure 4, in which the relationship between husbands' earnings and the likelihood that wives work are inverted "U" shaped. Note that the model coefficients are net of the linear-by-linear and sex asymmetry coefficients. In this case, the "U" shape disappears once the linear-by-linear association is added to the model. Thus, wives are less likely to work as their husbands earn more, controlling for the linear-by-linear association of husbands' and wives' earnings. Finally, the negative hypogamy coefficient indicates that marriages in which wives are in a higher earnings category than their husbands are rarer than marriages in which husbands are in the same or higher earnings category than their wives.

Table 8 illustrates the combined effects of these various parameters on the implied logged frequencies net of HYA and WYA for 1993 and 2007. The strong magnitude of the increase over time in the association between husbands' and wives' earnings, as well as the stability in the relationship between husband's earnings quintile and wives' non-earner status, are evident.

DISCUSSION

Our preliminary findings clearly support the conclusion that following the transition from state socialism the associations between spouses' education levels and earnings both increased in rather dramatic fashion. The increased associations pertain to both the probability of homogamy and also to the off diagonal associations. For both dimensions (education and earning), the association is strongest for the top of the distribution. The pattern of change for education is rather complex. In fact, the most pronounced increase in association obtains for the transition cohort: as that cohort aged and its members became exposed to post-transition marriages and divorces, its observed level of association between spouses' education levels grew in especially dramatic fashion. However, the post-transition cohort, whose entire experience of exposure to marriage and divorce occurred after the collapse of the Soviet Union, also had significantly stronger HW association than the transition cohort did at the point in time when its entire experience of exposure to marriage and divorce had taken place under Soviet conditions.

In our view, the sharp tendency toward increased homogamy and stronger HW associations with respect to both education and earnings during a compressed period of only fourteen years is theoretically plausible, given both the short-term external economic shocks and longer-term secular trends in union formation and dissolution behaviors in Russia. Russia turns out to be an interesting and thought-provoking case of dramatic and rapid increases in assortative mating in response to sweeping socio-economic changes. The implicit consequences for inequality are straightforward: marriage behavior clearly contributes more to inter-household inequality in Russia now than it did during the Soviet era: highly educated and high-earning Russians are more likely than previously to be married to highly-educated and high-earning spouses, while the least educated and lowest-earning Russians are more likely than before to have equally disadvantaged spouses. More than during the Soviet era, marriages in Russia now tend to compound rather than alleviate economic inequalities among households. This is an aspect of changing social stratification after the collapse of state socialism that has been largely overlooked in the long-standing debate over "market transition" theory.

In the next steps of our analyses we will try to assess whether the problematic education categories imposed by the 1993 survey instrument are producing some kind of systematic bias in our results. We will also attempt to tease out the various explanations for the increased homogamy among the transition cohort using data on the timing of current marriages in the 2007 survey. We will examine associations between husbands' and wives' occupations, sector of employment, and exposure to wage arrears (Gerber 2006). Finally, we will systematically compare the developments in Russia to trends in assortative mating within the United States during a comparable period, in order to provide a more rigorous comparative perspective for assessing the magnitude of the changes in Russia.

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TABLE 1. Comparing two (wife's) age groups at different points in time

A. Three cohorts observed

	Cohort 1	*Cohort 2*	*Cohort 3*
Year Born	**1975-1988**	**1961-1974**	**1947-1960**
Year turned 18	1993-2006	1979-1992	1965-1978
Age when observed, 1993		18-31	32-45
Age when observed, 2007	18-31	32-45	

B. Two dimensions of variation over time

	Ages 18-31	**Ages 32-45**
1993	Cohort 2	Cohort 1
2007	Cohort 3	Cohort 2

TABLE 2. Husband's Education (columns) by Wife's Education (Rows), by Age and Survey Year (Total %)

A. 1993, ages 18-31

	Less than sec.	Voca-tional	General Sec.	Sec. Plus	Univer-sity	*Row Total*
Less than secondary	0.9	0.4	1.7	1.2	0.2	4.4%
Vocational, no secondary	0.6	0.6	0.7	1.4	0.3	3.6%
General secondary degree	2.8	2.7	5.0	8.1	3.3	21.9%
Secondary + vocational/technical	3.1	2.7	10.0	16.7	7.4	40.0%
University	0.6	0.8	3.1	7.9	17.7	30.1%
Column Total	8.1%	7.1%	20.6%	35.3%	29.0%	N=1239

B. 1993, ages 32-45

	Less than sec.	Voca-tional	General Sec.	Sec. Plus	Univer-sity	*Row Total*
Less than secondary	0.3	0.3	0.8	2.1	0.5	4.0%
Vocational, no secondary	0.5	0.0	1.6	1.6	0.2	3.8%
General secondary degree	1.6	2.1	7.5	10.5	2.7	24.4%
Secondary + vocational/technical	3.0	2.7	8.5	21.4	6.1	41.7%
University	0.3	0.5	4.0	5.8	15.5	26.0%
Column Total	5.8%	5.6%	22.4%	41.4%	24.9%	N=629

C. 2007, ages18-31

	Less than sec.	Voca-tional	General Sec.	Sec. Plus	Univer-sity	*Row Total*
Less than secondary	1.3	0.0	0.7	0.6	0.1	2.8%
Vocational, no secondary	0.4	0.7	0.7	1.3	0.0	3.2%
General secondary degree	0.9	2.2	6.9	4.1	1.8	15.8%
Secondary + vocational/technical	1.3	2.0	6.3	27.4	6.7	43.8%
University	0.1	0.4	2.9	10.5	20.4	34.4%
Column Total	4.1%	5.4%	17.6%	43.9%	29.0%	N=683

D. 2007, ages 32-45

	Less than sec.	Voca-tional	General Sec.	Sec. Plus	Univer-sity	*Row Total*
Less than secondary	0.9	0.5	1.4	1.2	0.2	4.1%
Vocational, no secondary	0.3	1.7	0.3	1.9	0.5	4.8%
General secondary degree	1.7	1.0	4.7	6.2	1.9	15.5%
Secondary + vocational/technical	1.7	2.1	5.7	17.6	7.8	34.9%
University	0.5	0.9	3.8	12.1	23.3	40.6%
Column Total	5.2%	6.2%	15.9%	39.0%	33.7%	N=579

TABLE 3. Fit statistics for selected hybrid RCII models for HW association by period and age

	Description	L-sq.	df	contrast	contrast p	model p	BIC	d
1	**{YH}{YW}**	859.8	64			.000	344.8	.208
2	One homog. diagonal (HMG1)	412.9	63	1	.000	.000	-94.1	.134
3	Two homog. diagonals (HMG2)	223.6	62	2	.000	.000	-275.4	.084
4	Five homog. diagonals (HMG5)	199.1	59	3	.000	.000	-275.8	.079
5	RCII (with equal row/col. scores)	144.4	60	1	.000	.000	-338.5	.069
6	RCII+HMG1	112.4	59	2	.000	.000	-362.4	.060
7	RCII+HMG2	112.3	58	3	.000	.000	-354.5	.060
8	RCII+HMG5	107.6	55	4	.000	.000	-335.1	.059
9	RCII+HMG1*Y	94.2	58	6	.000	.002	-372.6	.056
10	RCII+HMG1*A	112.3	58	6	.753	.000	-354.5	.060
11	RCII+HMG1*C	94.0	57	6	.000	.001	-364.7	.052
12	RCII+HMG1*linC	105.4	58	6	.008	.000	-361.4	.057
13	RCII+HMG1*C3	112.4	58	6	.977	.000	-354.4	.060
14	RCII+HMG1*(Y+A)	93.6	57	6	.000	.002	-365.1	.056
15	RCII+HMG1*YA	82.5	56	6	.000	.012	-368.2	.050
16	RCII+(HMG1 + theta)*Y	92.9	57	6	.000	.002	-365.9	.054
17	RCII+(HMG1 + theta)*A	111.6	57	6	.674	.000	-347.1	.060
18	RCII+(HMG1 + theta)*C	92.4	55	6	.000	.001	-350.2	.050
19	RCII+(HMG1 + theta)*linC	103.5	57	6	.011	.000	-355.2	.056
20	RCII+(HMG1 + theta)*C3	111.7	57	6	.698	.000	-347.0	.059
21	RCII+(HMG1 + theta)*(Y+A)	91.7	55	6	.000	.001	-351.0	.056
22	RCII+(HMG1 + theta)*YA	80.8	53	6	.000	.008	-345.8	.048
23	RCII+HMG2*Y	79.4	56	7	.000	.022	-371.3	.050
24	RCII+HMG2*A	112.2	56	7	.943	.000	-338.5	.060
25	RCII+HMG2*C	88.5	54	7	.000	.002	-346.1	.046
26	RCII+HMG2*linC	99.2	56	7	.001	.000	-351.5	.055
27	RCII+HMG2*C3	108.8	56	7	.174	.000	-341.9	.054
28	RCII+HMG2*(Y+A)	78.6	54	7	.000	.016	-356.0	.054
29	RCII+HMG2*YA	67.3	52	7	.000	.075	-351.2	.037
30	**RCII+(HMG2+Theta)*Y**	**71.8**	**55**	**7**	**.000**	**.064**	**-370.8**	**.049**
31	RCII+(HMG2+Theta)*A	109.9	55	7	.494	.000	-332.7	.061
32	RCII+(HMG2+Theta)*C	87.9	52	7	.000	.001	-330.6	.046
33	RCII+(HMG2+Theta)*linC	98.7	55	7	.003	.000	-344.0	.055
34	RCII+(HMG2+Theta)*C3	108.1	55	7	.238	.000	-334.5	.054
35	RCII+(HMG2+Theta)*(Y+A)	65.4	52	7	.000	.100	-353.1	.048
36	RCII+(HMG2+Theta)*YA	53.3	49	7	.000	.314	-341.1	.031
37	RCII+Theta*Y	100.9	57	7	.001	.000	-357.8	.056
38	RCII+Theta*YA	90.2	55	7	.000	.002	-352.5	.054
39	RCII+Theta*Y, HMG2*(Y+A)	70.9	53	7	.000	.051	-355.6	.049
40	RCII+Theta*(Y+A), HMG2*Y	69.0	54	7	.000	.082	-365.5	.049
41	RCII+Theta*YA, HMG2*Y	65.5	53	7	.000	.116	-361.0	.044
42	**RCII+Theta*YA2, HMG2*Y**	**65.5**	**54**	**7**	**.000**	**.136**	**-369.1**	**.044**

TABLE 4. HW Association Parameters, Preferred Model

A. Row/column scores (constant across year and age)

Less than secondary	-0.5260
Vocational, no secondary	-0.3333
General secondary degree	-0.0789
Secondary + vocational/technical	0.1812
University	0.7571

B. Three association parameters, by year and age

	Theta	*Homogamy 1*	*Homogamy 2*
1993, ages 32-45	1.9258	0.0462	1.0563
1993, ages 18-31	1.9258	0.0462	1.0563
2007, ages 32-45	4.0968	0.6171	0.0384
2007, ages 18-31	2.8328	0.6171	0.0385

Note: homogamy 1 = 1 for i=j and i<5; homogamy 2 = 1 for i=j=5

TABLE 5. Implied log(F) shift parameters for HW education categories, by year and age group, preferred model

A. 1993, ages 18-45

	Less	*Vocational*	*General Secondary*	*Secondary Plus*	*University*
Less than secondary	**.579**	.338	.080	-.184	-.767
Vocational, no secondary	.338	**.260**	.051	-.116	-.486
General secondary degree	.080	.051	**.058**	-.028	-.115
Secondary plus vocational/technical	-.184	-.116	-.028	**.109**	.264
University	-.767	-.486	-.115	.264	**1.721**

B. 2007, ages 18-31

	Less	*Vocational*	*General Secondary*	*Secondary Plus*	*University*
Less than secondary	**1.401**	.497	.118	-.270	-1.128
Vocational, no secondary	.497	**.932**	.074	-.171	-.715
General secondary degree	.118	.074	**.635**	-.040	-.169
Secondary plus vocational/technical	-.270	-.171	-.040	**.710**	.389
University	-1.128	-.715	-.169	.389	**1.662**

C. 2007, ages 32-45

	Less	*Vocational*	*General Secondary*	*Secondary Plus*	*University*
Less than secondary	**1.751**	.718	.170	-.390	-1.631
Vocational, no secondary	.718	**1.072**	.108	-.247	-1.034
General secondary degree	.170	.108	**.643**	-.059	-.245
Secondary plus vocational/technical	-.390	-.247	-.059	**.752**	.562
University	-1.631	-1.034	-.245	.562	**2.387**

TABLE 6. Fit statistics for selected models for HW earnings association by period

	Description	L-sq.	df	contrast	contrast p	model p	BIC
1	**{YH}{YW}**	367.385	50			.000	-30.9
2	Linear by Linear (LxL)	332.25	49	1	.000	.000	-58.1
3	LxL + Wives Zero Earn*Husbands quintile	280.954	44	2	.000	.000	-69.5
4	LxL*Y + Wives Zero Earn*Husbands quintile	142.92	43	3	.000	.000	-199.6
5	LxL*Y + Wives Zero Earn*Husbands quintile*Y	136.945	38	4	.309	.000	-165.7
6	**LxL*Y + Wives Zero Earn*Husbands quintile + Hypogamy**	**129.229**	**42**	**4**	**.000**	**.000**	**-205.3**
7	LxL*Y + Wives Zero Earn*Husbands quintile + Hypogamy*Y	127.459	41	6	.183	.000	-199.1
8	LxL*Y + Wives Zero Earn*Husbands quintile + Hypogamy + 5*5	128.781	41	6	.503	.000	-197.8
9	LxL*Y + Wives Zero Earn*Husbands quintile + Hypogamy + 5*5*Y	124.751	40	8	.045	.000	-193.9

TABLE 7. HW Earnings Association Parameters, Preferred Model

1993, Linear-by-Linear association	0.112
2007, Linear-by-Linear association	1.541
Wife, no earnings x Husband Q1	0.177
Wife, no earnings x Husband Q2	0.287
Wife, no earnings x Husband Q3	0.567
Wife, no earnings x Husband Q4	1.148
Wife, no earnings x Husband Q5	2.307
Earnings hypogamy	-0.288

Note: hypogamy = 1 for i>j; else hypogamy = 0

TABLE 8. Implied log(F) shift parameters for HW earnings categories, by year, preferred model

A. 1993

Wives	Husbands: *Not Working*	*Q1*	*Q2*	*Q3*	*Q4*	*Q5*
Not working	**.000**	.177	.287	.567	1.148	2.307
Q 1	-.288	**.078**	.157	.196	.274	.470
Q 2	-.288	-.154	**.269**	.336	.470	.806
Q 3	-.288	-.086	.115	**.504**	.706	1.210
Q 4	-.288	-.008	.272	.412	**.980**	1.680
Q 5	-.288	.160	.608	.832	1.280	**2.688**

B. 2007

Wives	Husbands: *Not Working*	*Q1*	*Q2*	*Q3*	*Q4*	*Q5*
Not working	**.000**	.177	.287	.567	1.148	2.307
Q 1	-.288	**1.079**	2.157	2.697	3.775	6.472
Q 2	-.288	1.561	**3.698**	4.623	6.472	11.095
Q 3	-.288	2.486	5.260	**6.935**	9.708	16.643
Q 4	-.288	3.565	7.417	9.343	**13.484**	23.115
Q 5	-.288	5.876	12.040	15.122	21.286	**36.984**

TABLE A1. Fit statistics for additional models of educational assortative mating

	Description	L-sq.	df	contrast	contrast p	model p	model BIC	d
43	**Crossings**	132.7	60	1	.000	.000	-350.2	.067
44	HMG1 + Crossings	127.8	59	2	.000	.000	-347.0	.063
45	HMG5 + Crossing	123.0	55	3	.000	.000	-319.7	.062
46	HMG1 + unidiff Crossings*Y	125.6	59	10	.008	.000	-349.2	.066
47	HMG1 + unidiff Crossings*A	132.1	59	10	.433	.000	-342.7	.067
48	HMG1 + unidiff Crossings*C	125.1	58	10	.022	.000	-341.7	.062
49	HMG1 + unidiff Crossings*linC	131.3	59	10	.237	.000	-343.5	.065
50	HMG1 + unidiff Crossings*C3	132.4	59	10	.582	.000	-342.4	.066
51	HMG1 + unidiff Crossings*(Y+A)	123.9	58	10	.012	.000	-342.9	.066
52	HMG1 + unidiff Crossings*YA	117.7	57	10	.002	.000	-341.0	.064
53	Free HMG1 and crossings by Y	87.9	54	10	.000	.002	-346.6	.053
54	Free HMG1 by Y, fixed cross.	109.9	58	10	.000	.000	-356.8	.059
55	Unidiff (HMG1+crossings) by Y	121.4	58	10	.003	.000	-345.4	.063
56	**Quasi-symmetry**	107.4	54	1	.000	.000	-327.2	.059
57	+ unidiff QS*Y	99.9	53	12	.006	.000	-326.6	.058
58	+ unidiff QS*A	106.7	53	12	.403	.000	-319.8	.059
59	+ unidiff QS*C	99.4	52	12	.018	.000	-319.1	.053
60	+ unidiff QS*linC	106.0	53	12	.236	.000	-320.6	.062
61	+ unidiff QS*Cohort 3	107.1	53	12	.567	.000	-319.5	.058
62	+ unidiff QS Y+A	97.9	52	12	.009	.000	-320.6	.058
63	+ unidiff QS*YA	91.3	51	12	.001	.000	-319.2	.055
64	**{YH}{YW}{HW}**	101.4	48	1	.000	.000	-284.9	.057
65	+ unidiff HW*Y	93.6	47	13	.005	.000	-284.7	.056
66	+ unidiff HW*A	100.4	47	13	.331	.000	-277.8	.057
67	+ unidiff HW*C	93.4	46	13	.018	.000	-276.8	.052
68	+ unidiff HW*linC	100.1	47	13	.254	.000	-278.2	.057
69	+ unidiff HW*Cohort 3	101.0	47	13	.542	.000	-277.2	.056
70	+ unidiff Y+A	91.1	46	13	.006	.000	-279.1	.056
71	+ unidiff HW*YA	84.4	45	13	.001	.000	-277.8	.053

Figure 1. Proportion Educationally Homogamous by Wife's Age and Year.

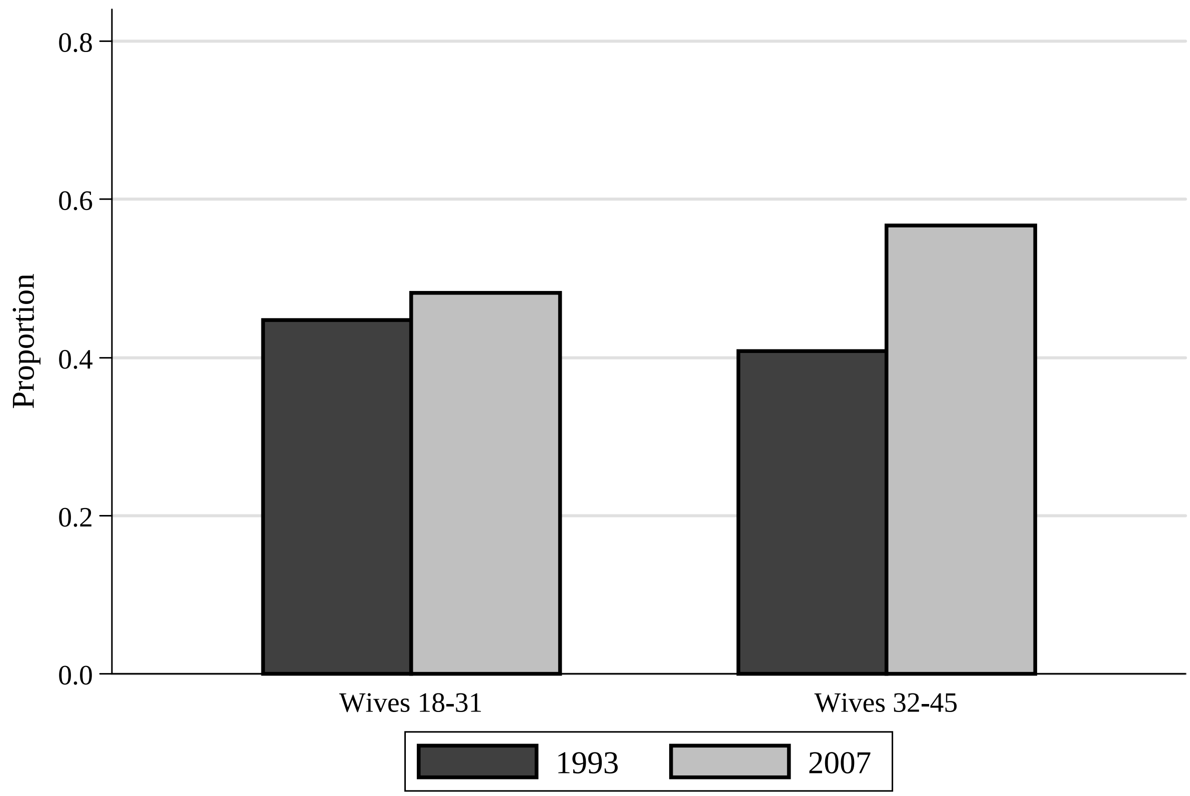

Figure 2. Correlation Between Husbands' and Wives' Annual Earnings by Wife's Age and Year.

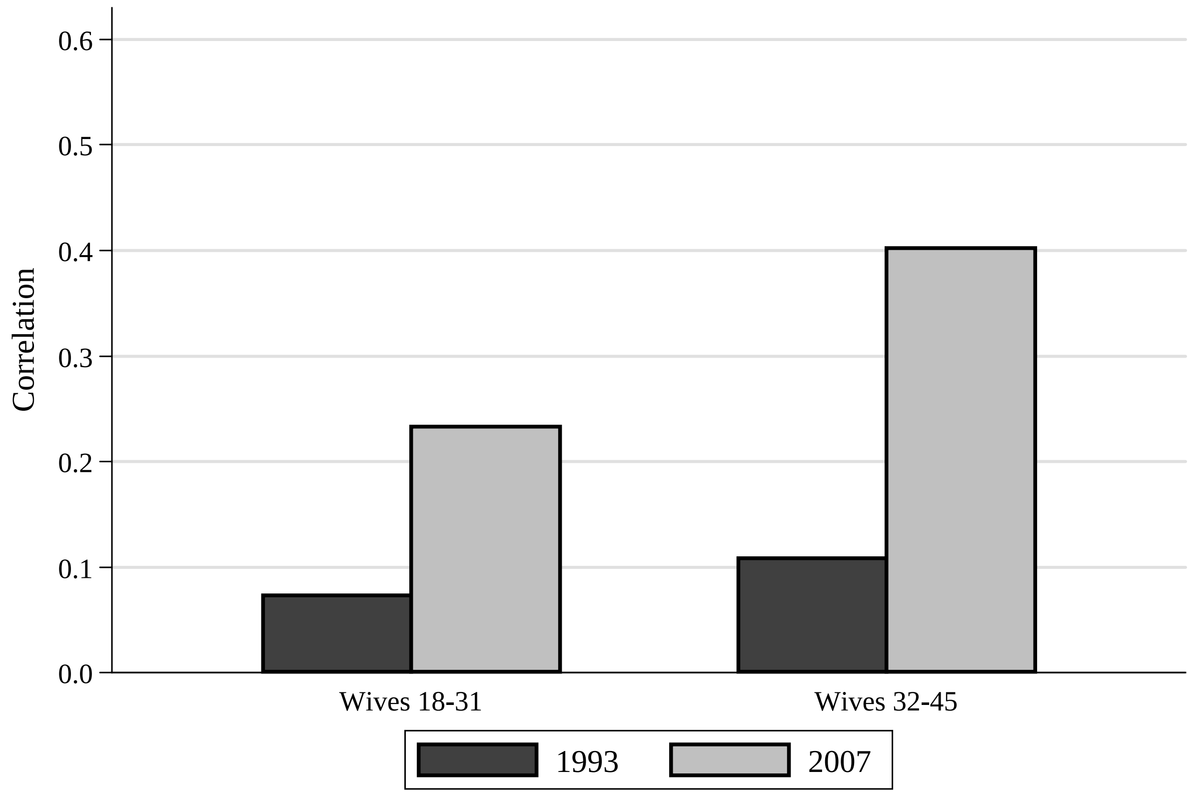

Figure 3. Mean Earnings Quintile of Wives with Non-Zero Annual Earnings by Husbands' Earnings Quintile and Year.

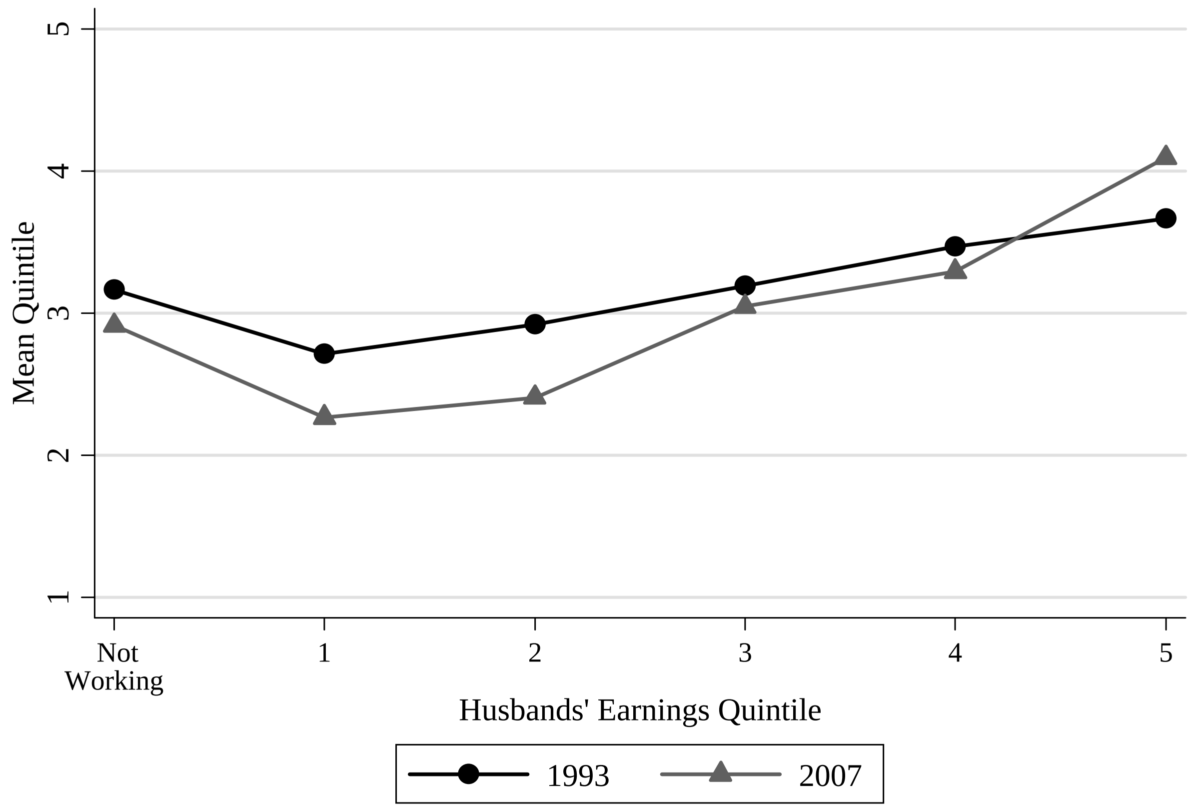

Figure 4. Proportion of Wives with Non-Zero Annual Earnings by Husband's Earnings Quintile and Year.