Does Educational Expansion Increase Educational Homogamy?

Dongshu Ou and Suet-ling Pong

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Abstract (149 words)

We estimate the causal effect of education on educational homogamy by taking advantage of the exogenous higher education expansion in Hong Kong in late 1980s which greatly increased women's access to universities. Using the expansion policy as an instrument, we estimate the correlation of individuals' and spouses' education level using a two-stage-least-squares regression model. The estimates identify the effects of the expansion policy on educational homogamy. Preliminary results show that the ordinary least squares estimates on individual women and their spouses' education are downward biased, indicating that those women who are most affected by the higher education expansion policy have a greater tendency to marry someone with a similar education level. Several robustness checks are performed. The study highlights the importance of understanding spillover effects on family formation when evaluating educational policies. The study also extends the current literature on higher-education-expansion policy's long-term impacts under a different institutional context.

Does Educational Expansion Increase Educational Homogamy?

Higher education expansion has far-reaching consequences beyond employment and earnings. One area of inquiry that is less visited is whether higher education expansion affects individual's marriage decisions. Scholars of social stratification have long been interested in whether individuals prefer spouses with similar education – educational homogamy. Because of education's association with occupational and other economic attainment, in a society with strong educational homogamy, couples with higher education can pool their social, cultural, and economic resources. The result is greater economic inequality and social hierarchy and segregation. Parents' educational attainment also affects their children's educational attainment. Therefore, educational homogamy in parents' generation likely leads to greater inequality in children's generation. Educational homogamy as a consequence of educational expansion may defeat educational policymakers' intention of providing equal opportunities.

One way to answer the question regarding whether educational expansion leads to greater educational homogamy is to examine trend data, as education expands over time. A review of the previous literature by Blossfield (2009) reported that the trend of educational homogamy was mixed. It followed an upward trend for some countries but a downward trend for others. Recently, Smits and Park (2009) found in 10 East Asian societies strong evidence of a trend towards less educational homogamy. They attributed this decreasing trend to the expansion of education, supporting the modernization theory. However, the causal effect of educational expansion on marital homogamy was not directly addressed. The difficulty is that education is an endogenous variable: individuals who pursue more education and enter marriages with highly educated spouses may have traits other than education that enable them to receive more education as well as to attract highly educated spouses in the marriage market. Using individual's education to estimate the spouse's education would likely produce biased result (Greenwood et al., 2014). Our study here attempts to remedy the technical problem through the use of an exogenous shock that aims to provide an unbiased or causal estimate of the relationship between education and educational homogamy.

Hong Kong is one of the societies included in Smits and Park's (2009) study. It provides a good case given its higher education expansion and rapid demographic changes since the 1980s. In 1989, eight years before the handover of Hong Kong by Britain to China, the Tiananmen Square student repression led to unprecedented protests in Hong Kong. Governor Wilson then took upon himself a decision to expand enrollment in postsecondary education threefold (Morris et al., 1994; Post, 2003; 2010). We take advantage of this exogenous policy shock to instrument individuals' educational level in order to estimate the causal relationship between individuals' education and their spousal educational attainment.

Data and Method

We use the 5% sample data of the 2011 Hong Kong Census. The sample is limited to married couples, where the wife is a Hong Kong native who likely receives all her education in Hong Kong. Individuals with incomplete information on their own education, spousal's education, and other demographic characteristics are excluded from our analysis. Table 1 illustrates the summary statistics of our sample.

The baseline specification for estimating the wife's educational attainment is

$$EDYR_{ic}^{w} = \alpha + \delta AFTER_{c}^{w} + g(YOB_{c}^{w}) + \varphi X_{ic}^{w} + \varepsilon_{ic}^{w}, \quad (1)$$

where *i* and *c* denote the individual woman and school cohorts (based on birth year and the school's cut-off date of December 31), respectively. *EDYR* represents years of education of the wife. Here we follow Ichino and Winter-Ember (2004) by taking the residual of a regression of years of education on a cubic polynomial of age estimated for females. The residual, rather than the actual educational level, will then be used in the regression. The assumption is that the gender-specific polynomial form of age can capture the secular educational trend. Furthermore, we include in the regression a functional form of year of birth (*YOB*). *AFTER* is the dummy for being in the higher education expansion cohort. *X* includes three demographic controls, which are dummies for industry of work, location of work, and multilingual ability.

The husband's education, which will be used later as the dependent variable to estimate educational homogamy is initially treated in the same reduced form as his wife's education in equation (1) by replacing $EDYR^{w}$ by $EDYR^{h}$. Again we take the residual rather than the actual years of education for the husband, $EDYR^{h}$, around a cubic polynomial of age. We further assume that higher education expansion affected women's choice of spouse only through the increased education women obtained after the policy was implemented. The correlation between spouses' education and the individual's education can be estimated by a two-stage least square (2SLS) model:

$$EDYR_{ic}^{h} = \psi + \beta EDYR_{ic}^{w} + \gamma(YOB_{c}^{w}) + \rho X_{ic}^{w} + \omega_{ic}^{h}, \quad (2)$$

The *AFTER* dummies are used as instrumental variables for women's own years of education. The coefficient "β" in Equation (2) will illustrate the causal relationship between an individual woman's educational level and her spouse's educational level.

Results

Table 2 provides the reduced form estimates of higher education expansion on women's and their husband's education. Column (1) and (2) are estimates without individual controls. Column (3) and (4) are regressions including individual controls of women. The positive and statistically significant coefficients in column (1) and (3) indicate that the higher education expansion policy is a strong predictor of women's increased educational level. Further, Column (2) and (4) shows that the after-expansion-policy female cohorts also married to men with higher educational level.

Table 3 shows the ordinary least squares (OLS) and two-stage-least-squares (2SLS) estimates of women's education on their husband's education. Our results show that the OLS estimates on the correlation between the married woman's and her husband's education are biased downward, indicating that Hong Kong married women who are most affected by the higher education expansion policy have a greater tendency to marry someone with similar education. A one-year increase in wife's education is associated with a 2- to 4-year increase in the spouse's education. Put differently, women's education is causally related to their spouses' education, and higher education expansion has an effect of increasing educational homogamy in Hong Kong.

Robustness checks include alternating the polynomial form of age, including polynomial form of age in the structural form, using a smaller sample closed to the policy implementation period, including a functional form of quarter of birth instead of year of birth in the regressions. Results show consistent evidence that the affected cohorts of women married men who were more educated than women who were prior to the higher education expansion policy. Our results are different than that of Smith and Park (2009). Whilst Smith and Park (2009) cover the period of compulsory education expansion in Hong Kong, our paper investigates the impact of higher education policy that took place in late 1980s. Our results might shed light on the different unintended consequences of educational expansion policy at different stage: The universal provision of basic education could reduce educational homogamy in a society, however, expanded opportunities in higher education participation could have induced a greater degree of positive educational marital sorting.

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Table 1: Descriptive statistics

Variables	Mean (St. Dev)
age (women)	31.4838
	(4.095)
Years of Education (Women)	13.20453
	(2.451)
% of obtained an education beyond high school (women)	62.59%
% of obtaining college education and beyond (women)	11.55%
Husband's age	33.77094
	(4.597)
Husband's years of education	12.81004
	(2.888)
% of obtained an education beyond high school (Husband)	58.05%
% of obtaining college education and beyond (Husband's)	11.89%
Multilingual (women)	83.32%

Table2: Reduced form effects of higher education expansion on women's education and their husbands' education

Independent Variables	*WOMEN'S EDU*	*HUSBAND'S EDU*	*WOMEN'S EDU*	*HUSBAND'S EDU*
	(1)	(2)	(3)	(4)
Higher education expansion	1.837***	3.866***	0.680***	2.966***
	(0.365)	(0.388)	(0.315)	(0.395)
Demographic controls	No	No	Yes	Yes

Notes: Source: 5% sample data set of 2011 Hong Kong Census. Observations=4322. Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Table3: OLS and 2SLS estimates of women's education on husband's education

	OLS	2SLS
	(1)	(2)
No controls	0.6420***	2.1045***
	(0.0153)	(0.4127)
F-statistics (first stage)		25.3949
With controls	0.5690***	4.3609**
	(0.0176)	(1.9764)
F-statistics (first stage)		4.65786

Note: Source: 5% sample data set of 2011 Hong Kong Census. The dependent variable is husband's education residual on a cubic polynomial function of age. The controls include dummy for multilingual, dummy for work place and industry dummies. Quadratic year of birth is also included in the regression. Standard errors in parentheses, * p<0.10, ** p<0.05, *** p<0.01