

Better Late than Never: Social Stratification and Higher Education through the Life Course

Timing of life-course events is known to vary by the individual, with education no exception. Timing of education in China is particularly irregular, yet what little research there is on the topic has primarily focused on only a small segment of the population, persons who returned to cities after having been sent to rural areas during the Cultural Revolution. This paper demonstrates the widespread nature of graduation at non-normatively late ages between the 1990 and 2000 Chinese censuses. It then looks at factors associated with the hazard of enrollment in higher education for three age groups, using the 1999 Survey of Urban Residents' Family Life.

Progress through an academic system can be seen as a series of transitions in which each transition in the academic life-course is conditional on the outcome of the previous one, and individuals and their families (consciously or unconsciously) rationally estimate the likely outcomes of future transitions based on the transitions they have already made. For instance, the choice to attend academic rather than technical high school precedes the decision whether or not to enroll in college, and less advantaged students might estimate lower future performance in school as well as lower future returns to academic high school in comparison with technical high school. Social (dis)advantage is thus a cumulative process of tracking experienced across many transitions (Breen and Goldthorpe 1997). The relationship between educational attainment and social origins has been shown to depend on the distribution of schooling in the population as well as on the effect of social origins on the likelihood of making a particular transition to schooling (Mare 1981). Although almost every country has experienced a major expansion of education in the last 50 years, class differences in transition rates have remained relatively stable over time even while gender disparities have declined (Breen and Goldthorpe 1997). Much of educational stratification research has assumed continuous

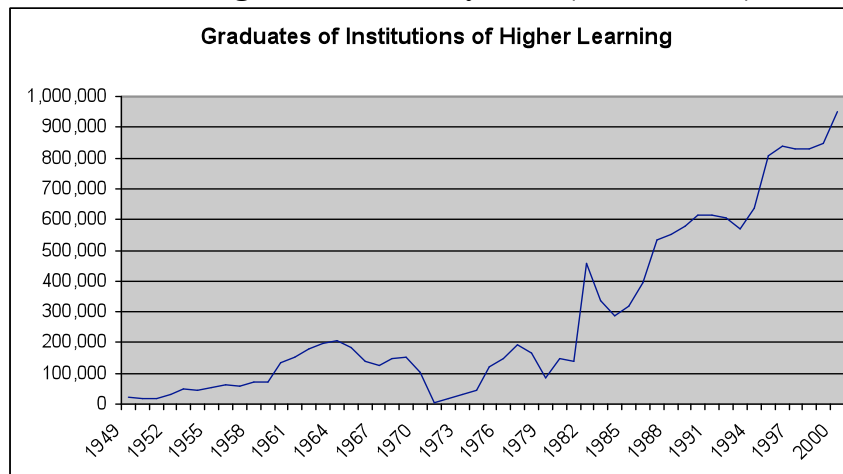
or near-continuous educational paths as normative, although it is known that educational disruptions can have substantial negative outcomes.

But what happens when individuals who seem to be on one trajectory or have already left school wish to increase their educational attainment? Elman and O'Rand (2004) visualize three pathways of educational attainment: one of early education to advantaged persons (cumulative advantage), early school exits resulting in low wages for the least advantaged, and a third pathway of late education to those in the middle, who attend school in later life without experiencing the benefits associated with earlier attainment. As the proportion of a population participating in higher education changes, more adults may re-enter the school system. Indeed, education in later life is becoming more common in industrialized (Hamil-Luker and Uhlenbert 2002) as well as some developing countries (Qian 1994-5).

The proportion of the Chinese population with tertiary education has always been small relative to the entire population, but has fluctuated widely and is now rapidly expanding. Chinese education policy in the twentieth century has been subject to major swings accompanying shifts in the state's view of national development (Tsang 2000). In the 15 years after the founding of the People's Republic in 1949, the number of graduates of four-year universities increased by almost 10-fold as the central government concentrated on urban development, despite a slow-down during the Great Leap Forward (1958-1960) as the educational focus shifted to basic education in rural areas (Hannum and Xie 1994). In the mid-1960's, the debate about national development centered on whether to encourage egalitarianism or focus resources whether they would be most

effective (i.e. higher education that would produce experts who could stimulate the economy.)

Figure 1: Number of Degrees Awarded by Year (2000 Census)



“Egalitarianism” won out in the Cultural Revolution of 1966-76, as education was discredited as a job credential in favor of political loyalty. Most higher education admissions stopped from 1966 to 1971, a year in which only 6,000 students graduated. Those students whose degrees were already in progress often could not graduate on time, resulting in a peak around 1980 in Figure 1 representing the simultaneous graduation of a backlog of several cohorts of students. Disruptions of primary and secondary schools were widespread as well, with most schools disbanded for several years, and many suffering physical damage or loss of personnel. What courses were held during this period often emphasized politics and labor in factories and fields, and no competitive college entrance examinations were held for several years. Meng and Gregory (2002) show that disruptions on schooling had an especially strong negative effect on the later educational attainment of those cohorts who missed the most years of secondary school, but all cohorts who missed schooling likely suffered. Disruptions had the largest effect for those from “bad” class backgrounds (Deng and Treiman 1997). Ironically, the

movement that started out to decrease social inequality may have actually increased it, as in Russia under the Soviet Union (Gerber and Hout 1995).

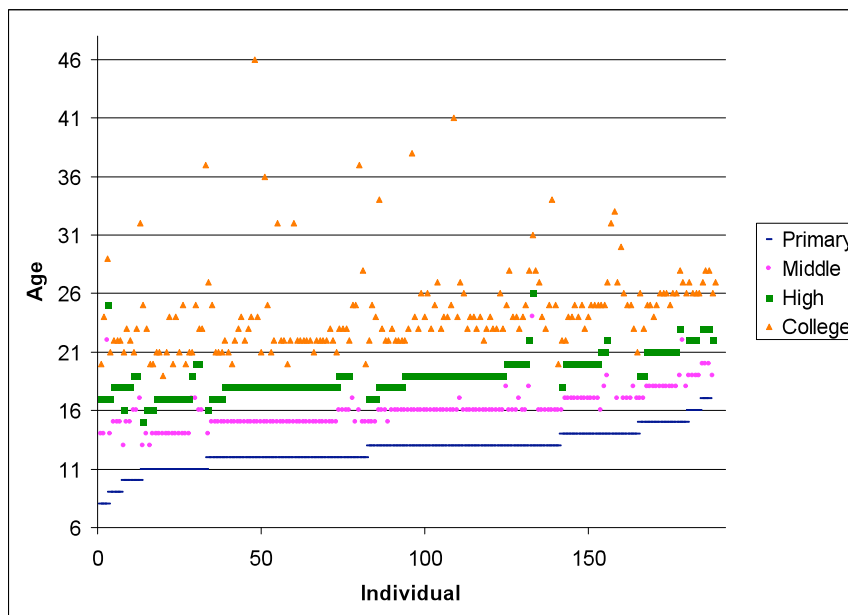
Poor economic progress during these years led to a return at the close of the Cultural Revolution to an emphasis on science and education in order to achieve modernization. In the reform period, status differences are to be tolerated as incentives, and a technocratic elite is essential to improving material resources for all. Since the early 1980's, the Chinese post-secondary educational system has still been characterized by a limited supply, due to comparatively low government investment in education compared with similar developing countries (Heckman 2003). The education system has been under enormous pressure throughout, with tens of examinees, including high school students, perennial examinees, and employed persons, for every enrollment slot in higher educational institutions. Just after the Cultural Revolution ended, competition was especially intense, as urban youths who had been sent down to rural areas returned to their cities and were allowed to take the college entrance examination from 1977-1981. During the reform period, an expansion in irregular and formal adult education has helped to relieve some of the pressure (Qian 1994-5, Xiao and Tsang 1999).

Traditionally stratification and education researchers have held that very few persons who had already entered the work force passed the examination, while those who few who did obtain higher education did so through irregular means such as television or correspondence schools (Qian 1994-5). However, higher education to adults in China has rarely been examined. Research on delayed education has focused on the youths who were sent-down from urban to rural areas during the Cultural Revolution (Xie and Jiang, forthcoming, Zhou and Hou 1999, Deng and Treiman 1997, Giles, Park, and Zhang 2003).

The sent-down youth were exempted from age limits on the exams between 1977-8 and 1981. Coming from another perspective, Li and Walder (2001) have pointed out the importance of the timing of party membership, as promising young people who are selected for party membership increase their chances of receiving a college education mid-career in a system of “sponsored mobility” so that the relationship between party membership and higher education is ambiguous.

Figure 2 plots individuals’ ages at graduation by level for the highest strata of educational attainment, university graduates, sorting by age at completion of primary school, then middle school, then academic high school, then university (SURFL data, see below). Many university graduates had not completed certain educational levels which usually would be considered prerequisites for college, such as middle school or academic

Figure 2: Age at Graduation by Education Level



high school. More interesting, even for these high achievers there is almost no normative age to complete a given level, with significant variation even at the primary school level accounting for some, but not all of the variation in timing of college graduation. Still,

disruptions at earlier levels are substantial, so party-sponsored mobility cannot fully explain the variation in college timing either.

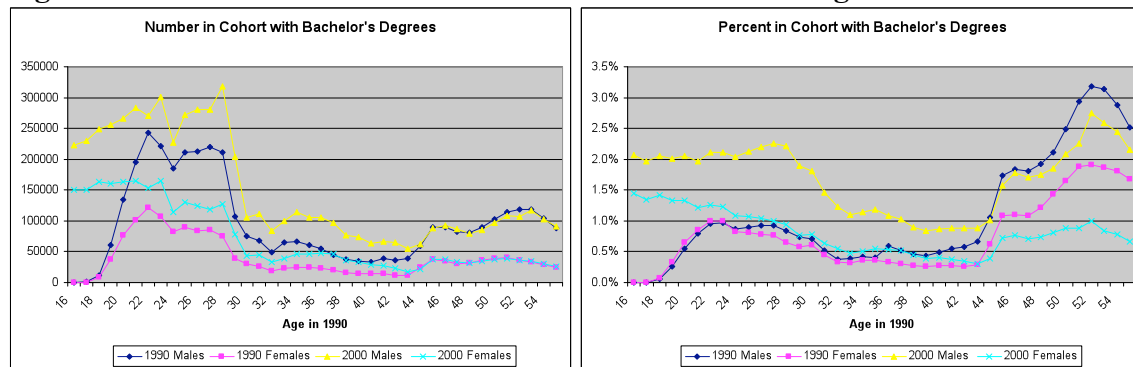
For the most part, researchers on social stratification in China have treated higher education earned in various years as equivalent, and have very rarely even collected data on year of graduation, with the implicit assumption that education is mostly a continuous process, although this is clearly not the case. Although Li and Walder (2001) discuss adult education, Meng and Gregory (2002) are perhaps the first to point out that education cannot be assumed to be continuous in the Chinese context. Focusing on the income effects of missed schooling and non-traditional primary and secondary curricula during the Cultural Revolution, they look at university entry age, defined as the respondent's age in 1978 for Cultural Revolution and year of turning 18 for other cohorts. They find a U-shape for probability of obtaining a bachelor's degree, with those 18 at the time of first examination having a probability over .12, a probability around .02 for 25-year-olds, and above .07 for those 31 at the time of their first examination. For "semi-degrees," a combination of junior college and correspondence degrees, the probability of enrollment by age is actually higher for those 29-31 in 1978 than for 18-year-olds, but the effect of age is smaller. The effect of missed schooling is found to be strongest for those who were between 23 and 26 at the time exams resumed in 1978 and had missed the most years of junior and senior high school combined. They also found that marriage before the first possible examination had a strong negative effect on enrollment for women. The groups who experience the most delay in education were those whose parents were less-educated and had lower occupational status, and this effect of having less-educated

parents was stronger for women. Finally, the effect of missed schooling, especially high school, was more important than examination delay.

While Meng and Gregory (2002) assume disruptions to have occurred at uniform times for all respondents, Giles, Park, and Zhang (forthcoming) calculate city-wide birth cohort disruptions to education from individual start dates at various levels and assign those to individuals within the area to avoid correlations between individual characteristics and disruptions. They claim youth returning from having been sent down sat for the competitive merit-based college entrance exams between 1977 and 1981, while Meng and Gregory used 1978 as the date of the first exam. They calculate the average delay in starting various educational levels, as well as average attainment of those levels, by birth year for five cities, as well as correlations between disruptions and attainment by level. For the time being, we do not attempt to model the timing of disruptions, although we include a dummy variable for sent-down youths.

Extent of Adult Education in China

These studies have treated delayed education and age variation in education as purely a result of the Cultural Revolution. This paper argues, however, that the phenomenon of interrupted education is not limited to the Cultural Revolution; that the trend is in fact continuing among those coming of age during the reform period as well. Figure 3 shows 1990 and 2000 census data for college degrees from regular institutions of higher learning (bachelor's and graduate degrees) by age in 1990. For those in their mid-twenties through mid-forties in 1990, almost half of the college degrees were earned between the 1990 and 2000 censuses. Persons age 18-22 during the Cultural Revolution years of 1966-1976 would have been 32-46 in 1990. As expected, the 1990 census shows

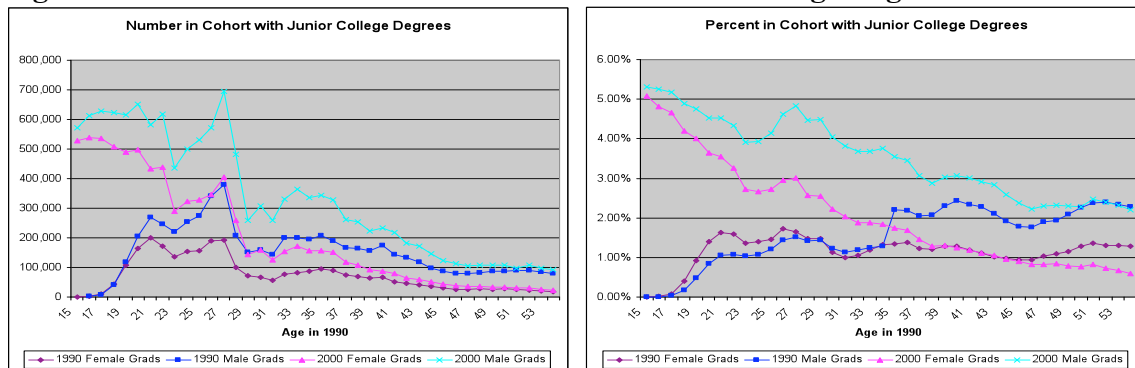
Figure 3: Number and Percent of Cohort with Bachelor's Degrees

a large drop in the number and percentage with degrees around age 46, with the 2000 census showing that much of this decline has been compensated for with late degrees. But the proportion is the same and the number of late graduates is much larger for those less than 32 in 1990; the percentage of 35-year-old males in 2000 with degrees was almost twice that of 25-year-old males in 1990, although that cohort is too young to have missed school during the Cultural Revolution. Clearly, college education after age 25 is commonplace for younger groups as well. Furthermore, given that 1971-5 are the years when the fewest students graduated due to school closings, we would expect that those 18-22 in 1971-5, or 35-41 in 1990, would have the highest levels of delayed schooling. However, the highest levels of delayed schooling appear to occur for those in their mid to late twenties in 1990. Paradoxically, educational attainment for men over 45 in 1990 is slightly lower in the 2000 census than in the 1990 census; this paradox is further amplified in the cohort percentages. The reasons for this discrepancy are not clear.

Similarly, late junior college degrees are noticeable until the late fifties, close to traditional retirement age, consistent with the comparatively lower financial and academic burden and easier enrollment process for older graduates who would have less time to enjoy the higher returns of a university education. Respondents born in 1965, too

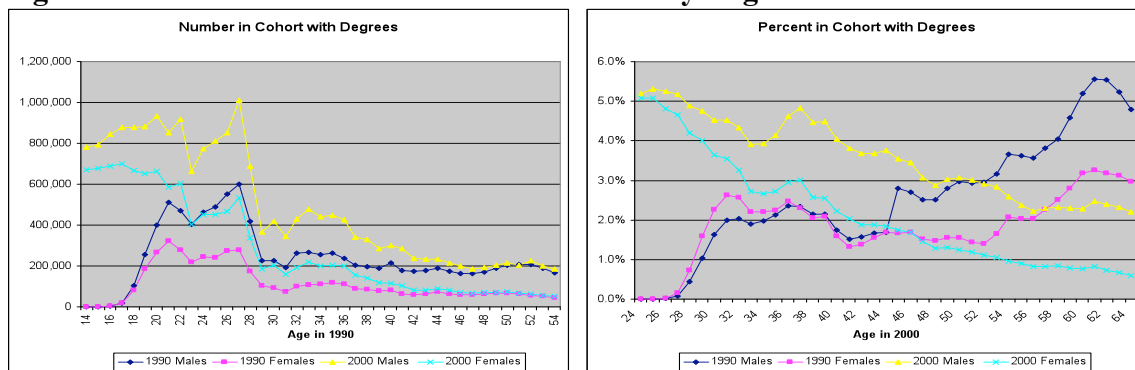
late to have missed years of schooling in the Cultural Revolution, earned about half of the junior college degrees they held by age 35 after age 25, and it is reasonable to think that this cohorts' attainment will increase by the 2010 census. Also striking in view of the gender structure of university degrees is the indication that junior college degrees are approaching gender parity for younger cohorts. One source of confusion shows up for

Figure 4: Number and Percent of Cohort with Junior College Degrees



females over 40. Although the 2000 census counts more junior college graduates than the 1990 census at every age, the 2000 census counted far more people at those ages, resulting in a crossover of the percentages educated in those years. Although readers should add imaginary wide error bars to these graphs due to the difficulty of enumerating China's population, measurement error cannot be imagined to be large enough to explain

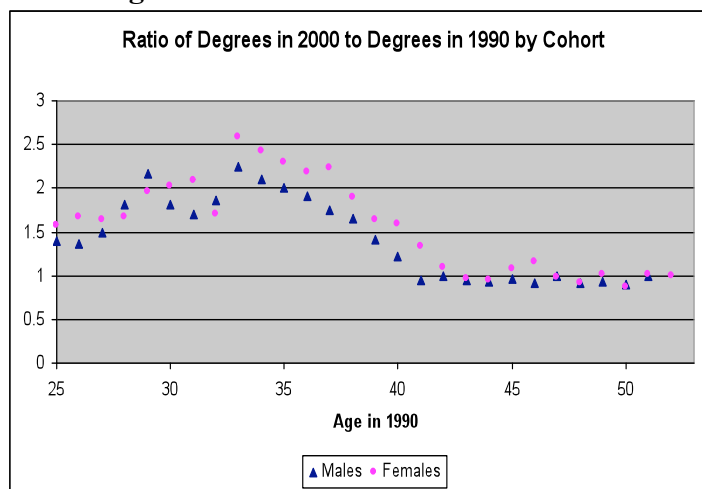
Figure 5: Number and Percent of Cohort with Any Degrees



away the findings. Figure 5 sums the cohort numbers and percentages with university or junior college education to find the overall cohort figures for higher education. The problems with the percentages for older respondents in the 1990 census are compounded in this overall data.

There is a noticeable gender gap in educational attainment in China, but this problem is mitigated by late degree attainment. Figure 6 shows the ratio of degrees held by cohort and sex in 2000 to 1990. Although fewer total degrees or late degrees are awarded to women, a slightly higher proportion of women's degrees are earned late. This is striking in view of Meng and Gregory's 2002 finding that women who were married at the time the college entrance exam was first available to them were much less likely than unmarried women to enter college. Around 90% of women are married by age 27.

Figure 6: Ratio of 2000 to 1990 Total Graduates by Sex



Dataset

This study uses the 1999 Study of Urban Residents' Family Life, representative of adults in Shanghai, Wuhan, and Xi'an, which are all large cities. The survey design consists of a matched-pair sample of elders and one of their adult children living in the same city, as well as a general sample aged 16-95, yielding an overall sample of 4,444

respondents. Questions speak primarily to the individual's economic condition, family, time use, satisfaction with China's economic and societal development, and attitudes about family formation and roles.

Because our survey data come from large cities, we face bias resulting from selective migration into cities by more talented individuals and selective migration away from cities by less talented graduates. Educational attainment and income vary widely by region in China (Xie and Hannum 1996). Few graduates live in rural areas, although many live in towns. Migrants and non-migrant graduates may also differ in occupation or other characteristics. Due to the lack of information on age of graduation in nationally representative surveys, and like many other studies, we merely note this problem in passing. However, perhaps because of small sample size, and perhaps because of migration, city to city comparisons were not consistently significant (not shown).

Like studies of income returns to education, our survey contains two categories of higher education, which we call "university" and "junior college." For some reason, the SURFL specifies that transfer students are not included as university students.

Unfortunately, the SURFL, like other studies of higher education in China (Giles, Park, and Zhang, forthcoming, Meng and Gregory, 2002) combines a wide variety of higher education options, from television and correspondence schools to formal 2 and 3 year degrees (Qian 1994-5) into the junior college category, which Meng and Gregory call a "semi-degree." These degrees may or may not vary in terms of knowledge gained and labor market outcomes. In addition, a small proportion of university graduates also hold junior college degrees or graduate degrees. Because we are interested in the hazard of first entrance into any kind of higher education, we combine all kinds of higher education,

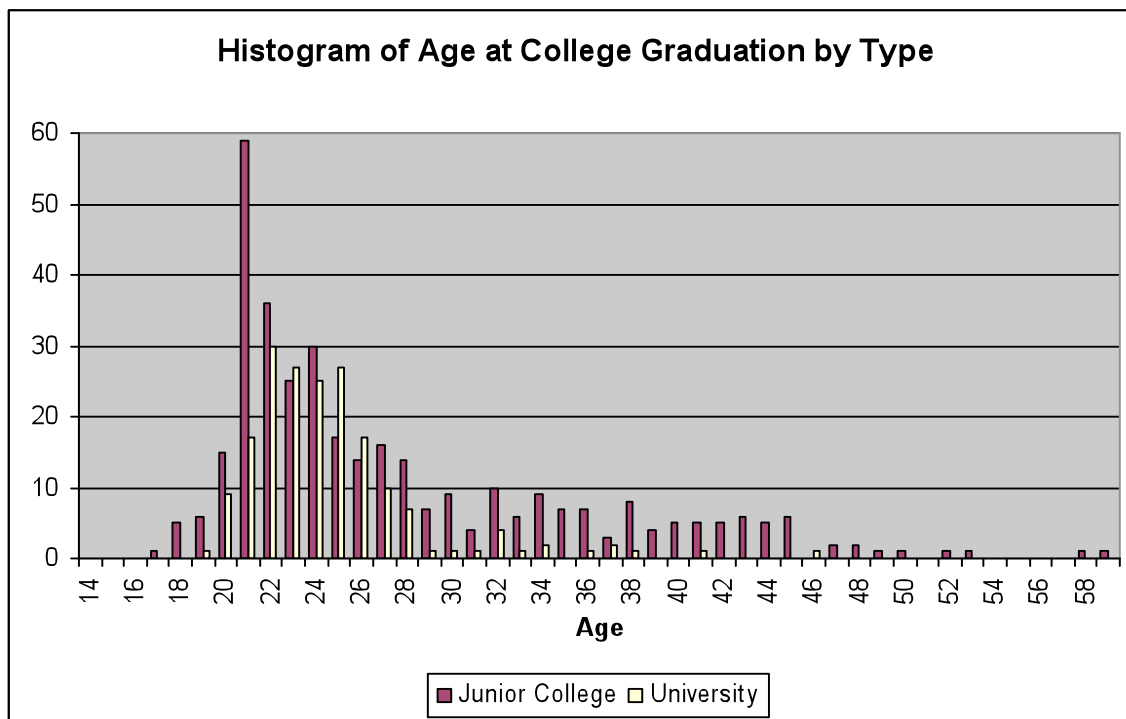
and in the case of multiple degrees, we use the respondent's year of starting the first tertiary degree. However, we do not count a respondent who has a graduate degree but never enrolled in junior college or university.

How do early and late graduates differ in personal characteristics?

Age

Most obviously, early and late graduates enroll at different points in their life course. Overall, 621 respondents attended higher education; 419 attended junior college and 214 attended university. The mean age of graduation from university is 24.6 with a standard deviation of 3.9, while the mean age of graduation from junior college is 27.8 with a standard deviation of 8.1. Figure 7 is a histogram of age at graduation for junior college and university graduates. The age structure for junior college attendance is wider, and most later graduates attended junior college, while university graduates are more

Figure 7: Age at Graduation By Education Type



tightly clustered at earlier ages. The oldest junior college graduates worked between two and ten years between graduation and retirement, allowing little time to reap the rewards of their investment. Overall, 40% of university graduates and 50% of junior college graduates finished after age 25, with 8% and 30% graduating after age 30, respectively.

Gender, Party Membership, and Occupation

As seen in the census data, there is a strong gender gap in higher educational attainment in China. Overall, men are almost twice as likely to graduate, regardless of age or graduation timing. This effect is compounded as women graduates are less likely to be party members and less likely to be cadres even if they are party members. Only about a third (33.8%) of the sample of university graduates is female consistent with the proportion of female graduates in the 2000 census data (34.9%). In the reform period, the Chinese Communist Party has sought to recruit talented and highly educated individuals, as well as facilitating the education of those who already belong to the party (Li and Walder 2005, Hauser 2003). About 40% of the on-time grads and 60% of the late grads are party members.

The gender gap mentioned above is compounded by its interaction with party membership; only one third of female college graduates in the sample are party members, while more than half of male graduates had joined the party. Of 191 college graduates, about half (95) were cadres in the jobs they had held the longest, with 30 below and 37 at first (*keji*) level, 24 at the second (*chuji*) level, and 4 at the third (*juji*) level or above. Only 32% of women were cadres, with none at the third (*juji*) level or above, although 58% of men were cadres.

Wu and Xie (2003) show the importance of occupational sector change in change in returns to income. Obtaining higher education might be one important pathway to exit the state sector or change careers, given China's high job stability. As expected, late graduates were more likely to have changed sectors: 85% of on-time and 63% of late graduates last worked in the same sector as their first job. Job sector itself should also have a cause and effect relationship with educational attainment (Xiao and Tsang 1999).

Cultural Revolution Experience and Background

Delayed education has traditionally been associated with the send-down experience and the Cultural Revolution. But only 20% of late grads (compared to 6% of on-time grads) were 18-24 in 1971, the year of lowest college enrollment during the Cultural Revolution. Having been sent-down to a rural area to work for a period of years has a more straightforward relationship to educational delay. Only 29% of graduates after age 24 (compared to 10% of on-time grads or 17% total) had ever been sent-down. Social origin is likely to have a quite strong relationship with educational attainment. Parents from advantaged occupations may have social connections useful in encouraging their childrens' education. More educated parents may be able to help mitigate disruptions in formal education and help their children prepare for examinations. However, educational attainment may not be a completely straightforward outcome for parents' either. In addition, mothers' and fathers' characteristics are strongly correlated.

Income

Stratification researchers have been most interested in the effect of delayed education on income returns to education. A simple plot of income for respondents below and above age 25 at graduation (not shown) reveals the expected answer: "on-

time” graduates have a wider distribution of incomes and are more likely to be in the highest income quartile, while graduates after age 25 have a more compact income distribution.

Method

Given the differences among early and late graduates, it would be useful to know what factors are associated with enrollment in higher education at three age groups. I employ multivariate logistic regressions in a discrete-time hazard analysis to estimate the relationship between respondents’ characteristics and the timing of college. The unit of analysis is the person-year of exposure to enrollment in higher education. The dataset contains multiple observations for each respondent such that the dependent variable for each year prior to enrollment is coded 0, and each year after enrollment is coded 1. For respondents who had not enrolled in higher education by 1999, the year of data collection, the dependent variable for all person-years is coded 0.

I dropped respondents who had not graduated from at least one secondary school level, as they were likely at very low risk of enrollment (lower middle school, vocational high school, or academic high school). This left 413 respondents who had ever been junior college students and 209 who had been university students, as well as 515 respondents who had attained some secondary education and thus theoretically could have taken the college entrance examination. Respondents who graduated before 1949 are also excluded, with the idea that factors associated with college enrollment might have changed after the revolution, and because they do not tend to be in the 1999 labor market.

Factors associated with the hazard of entering higher education are presented at three age groups: enrollment by age 25, by age 34, and by age 43. In each period, respondents who graduated from college in the previous periods are removed from the sample because they are no longer eligible to enroll for the first time. This results in a changing sample for each group; descriptive statistics are shown in Appendix A. The proportion male declines across periods as men disproportionately enroll, but the proportion with party membership increases due to late enrollment. While 43% of the sample enrolled in higher education by age 25, if they had not enrolled by 34 they had only a 6% chance of doing so by age 43. The small number of respondents in the sample with higher education in this sample, as in any sample available to the researchers, results in a general problem of small sample size. For this reason, we have chosen to create two separate models, one including factors related to labor market experience, and one related to family and life-course events.

Model 1: Occupational Factors Associated with Hazard of College Entrance

	Before Age 25			Ages 25 to 34			Ages 35 to 43		
	Coefficient	Std. Error		Coefficient	Std. Error		Coefficient	Std. Error	
Male	0.502	0.133	***	0.277	0.263		0.227	0.379	
Party Member by ages 25, 34, 43 respectively	-0.308	0.208		1.239	0.266	***	0.926	0.380	*
Occupation in First Job	0.575	0.065	***	0.159	0.120		0.191	0.172	
Same Sector	-0.143	0.157		-0.273	0.286		-0.403	0.401	
Quiz Score	0.055	0.013	***	0.102	0.028	***	-4.555	0.986	
Constant	-3.294	0.358	***	-4.870	0.760	***	-4.555	0.986	***
N	1100			632			553		
Pseudo-R ²	0.0814			0.0982			0.0520		

*** p<.005 ** p<.01 * p<.05

Model 1 shows the association of labor market factors with the hazard of college enrollment in various life stages. Men are more likely to obtain higher education in China. Consistent with Figure 6, however, the effect of male sex in Model 1 seems to be significant and larger for on-time enrollment, so that males are 1.65 times as likely as females to enroll by 25. Those who were party members by age 34 had 3.45 times the yearly odds of enrollment at ages 25 to 34, and membership by 43 increases the yearly odds of enrollment in the late age group by .926. Occupation in the first reported job is measured on the Treiman ISEI scale, which ranges from 0 to 90. Respondents who report never having had a job ($n=35$) were dropped, and the scale was recoded into 4 categories according to quartiles. An increase in one quartile of occupational status of the first job held was highly significant for early period college entrance. Respondents in the highest quartile had 5.61 times the odds of enrollment than those in the lowest occupational quartile.

Changing from the public to the private sector is well-known to be related to increased returns to education, especially for those who changed sectors later in the reform period (Wu and Xie 2003). Job sector here is measured differently, dividing jobs into 11 sectors. Intuitively, a desire to change sector might be a reason to acquire higher education, or higher education might expose a person to the knowledge and contacts necessary to make a switch. Changing job sectors was not significantly associated with college enrollment in the middle period and highly significant in the later period. Logically, changing sectors would have no effect for those who obtained their degree before they had a chance to work in two different sectors.

Respondents were asked a 14 question word-similarity test, including “How are a king and a president similar?” Responses were graded by the interviewer on variable scales, leading to a 31 point scale which is significantly correlated with a wide range of variables, but not with age. A ten-point increase in this verbal intelligence measure increases the yearly odds of enrollment by .73. Interestingly, the significance of the association between verbal acuity and enrollment is not strong for the latest enrollment group, and seems to have a large negative effect on the chances of enrolling even though the quiz score has only a .15 correlation with age.

Model 2 estimates the hazards of enrollment in higher education by 25, by 34, and by 43 when controlling for family and background-related variables. Birth year is highly significant for the youngest enrollees and significant for the oldest enrollees, likely due to the rapidly expanding education system for the youngest cohorts and the send-down experience for the older students. Male gender is included as a control and is not significant for this model.

Model 2: Background Factors Associated with Hazard of College Entrance

	Before Age 25			Ages 25 to 34			Ages 35 to 43		
	Coefficient	Std. Error		Coefficient	Std. Error		Coefficient	Std. Error	
Male	0.339	0.192		0.450	0.336		0.402	0.489	
Birth Year	0.051	0.011	***	0.006	0.021		-0.098	0.035	**
Ever Sent-Down	0.451	0.246		-0.760	0.357	*	-1.197	0.492	*
Fathers' Occupation	0.205	0.061	***	0.317	0.117	**	0.210	0.165	
Married by ages 25, 34, 43 respectively	-0.214	0.221		-1.638	0.558	***	0.399	1.292	
Constant	-4.064	0.749	***	0.702	1.312		5.694	2.190	*
N	552			311			261		
Pseudo-R ²	0.0710			0.0975			0.1717		

*** p<.005 ** p<.01 * p<.05

As expected, ever having been sent-down to a rural area has a non-significant positive effect on the earliest students (increasing the odds by 1.56 times), who either were sent down after graduation or returned to the city by enrolling in school, and a negative effect on the second and third age groups. The yearly odds of enrolling decline with age for those sent-down, decreasing them by 2.13 and 3.31 times in the middle and late terms. These mixed and sometimes positive effects of an otherwise traumatic life experience are discussed in other research (Xie, Jiang, and Greenwell 2006, Zhou and Hou 1999, Deng and Treiman 1997).

Father's occupation at respondents' age 16 was based on the ISCO occupational scale. The data is missing for 47.5% of respondents, whose fathers were unemployed or deceased when the respondent was 16, who did not know, or were not asked their fathers' occupations because they were coded as elders in the matched-pair design of the SURFL data. Missing data is dropped, values 1-200 are coded as 5, 201-400 as 4, 401-600 as 3, 601-800 as 2, and 801-998 as 1. Lower occupation codes represent higher-status occupations, so a positive coefficient of fathers' occupation indicates that respondents whose fathers had higher-status jobs were more likely to enroll in higher education. As expected, the effect of fathers' occupation becomes less significant with age while the size of effects remains similar: the odds of enrollment increase by 1.23 times in the early and late periods and 1.37 in the middle period. The relationships of fathers' education and mothers' education or occupation with respondents' education were not strong, likely a result of the rapidly expanding education system (not shown).

Marriage also shows a differing effect across the life-course. Of the ever-married male and female respondents who met the educational requirements to be included in our

sample, 61% and 32% were married by age 25, and 98% and 92% by age 34. Given that 75% of the sample who had one or more children had had a birth within 3 years of marrying, it seems that respondents in the 25-34 age group often have a small child at home. It is not surprising, then, that marriage by age 34 has a highly significant, negative effect on enrollment between ages 25-34, decreasing the yearly log-odds by 5.14 times. For respondents who are unlikely to have married yet or are less likely to have small children, marriage has no statistically significant effect. The somewhat negative coefficient of marriage in the first period, and positive effect of marriage in the older category are intuitive, as lower age at marriage likely indicates that the respondent did not expect to enroll and non-marriage in a society with nearly universal marriage likely is correlated with some negative unobserved features also associated with enrollment. An interaction term of female gender and marriage was not significant (not shown), however, which could suggest that the effect of marriage is the same for men and women, or could be an area for more careful future investigation.

Conclusion

As many as 40% of university and 50% of junior college graduates in China graduated after age 25, yet stratification researchers have rarely observed this striking fact. Indeed, education in China cannot be assumed to be continuous, as variation at every level is substantial. While delayed and adult education are often associated with disruptions due to the Cultural Revolution, cohorts too young or old to have missed pre-college education have also experienced substantial levels of higher education at non-normatively late ages. Indeed, the widespread irregularities in educational trajectories

among the urban Chinese labor force provide an excellent opportunity for study of the causes and effects of educational timing.

Timing of college enrollment is associated with a number of variables in ways that vary across individuals' employment life-courses, including occupation of first job, party membership, verbal intelligence at time of test, birth cohort, sent-down experience, father's occupation, and marriage. Income returns to various types of higher education and according to timing are likely to differ, yet returns to education have not been estimated separately for early and late graduates. Results of the hazard analysis show that marriage deters yearly odds of enrollment between ages 25 and 34, while party membership by 34 is associated with higher enrollment odds in that period and after.

Unfortunately, little data has been collected to shed light on issues related to higher education in China, even though provision of higher education has been increasing at an almost exponential rate in the last few years. Survey researchers should pay closer attention to the timing and diverse types of higher educational experiences available in China today. Survey instruments could be designed to inquire about the start and stop dates at each education level, the name and type of school, the amount of time spent on coursework vs. employment, tuition and other financing, as well as party and work unit sponsorship of individuals. More research is needed on the variety of schooling available, as well as entrance and evaluation criteria of schools present and past. Little is known about how employers evaluate job applicants' educational credentials, or how income returns to education are related to quality and timing of education. Problems of small sample size for well-educated individuals in nationally or locally representative surveys could be ameliorated by over-sampling professionals or those with degrees.

References

- Breen, Richard, and John H. Goldthorpe. 1997. Explaining Educational Differentials: Towards a Formal Rational Action Theory. *Rationality and Society*, 9(3), 275-305.
- Deng, Zhong and Donald J. Treiman. 1997. The Impact of the Cultural Revolution on Trends in Educational Attainment in the People's Republic of China. *American Journal of Sociology*, 103(2), 391-428.
- Elman, Cheryl and Angela O'Rand. 2004. The Race is to the Swift: Socioeconomic Origins, Adult Education, and Wage Attainment. *American Journal of Sociology*, 110(1), 123-60.
- Gerber, Theodore P. and Michael Hout. 1995. Educational Stratification in Russia During the Soviet Period. *American Journal of Sociology*, 101(3), 611-60.
- Giles, John, Albert Park, and Junwei Zhang. 2003. The Great Proletarian Cultural Revolution, Disruptions to Education, and Returns to Schooling in Urban China. <http://www.econ.yale.edu/seminars/NEUDC03/GilesParkZhangNEUDC2003.pdf> (Note: Authors wish not to be cited as draft is preliminary.)
- Hamil-Luker, Jenifer and Peter Uhlenberg. 2002. Later Life Education in the 1990s: Increasing Involvement and Continuing Disparity. *The Journals of Gerontology*, 57B, S324-32.
- Hannum, Emily and Yu Xie. 1994. Trends in Educational Gender Inequality in China, 1949-1985. *Research in Social Stratification and Mobility*, 13: 73-98.
- Hauser, Seth. 2003. Causation or Selection? The Earnings Advantage of Communist Party Membership in Urban China. Unpublished Dissertation, University of Michigan.
- Heckman, James J. 2003. China's Investment in Human Capital. *Economic Development and Cultural Change*, 51: 795-804.
- Li, Bobai and Andrew Walder. 2001. Career Advancement as Party Patronage: Sponsored mobility into the Chinese Administrative Elite, 1949-1996. *American Journal of Sociology*, 106(5), 1371-1408.
- Mare, Robert D. 1981. "Change and Stability in Educational Stratification." *American Sociological Review*, 46, 72-87.

- Meng, Xin and Gregory R. G. 2002. The Impact of Interrupted Education on Subsequent Educational Attainment: A cost of the Chinese Cultural Revolution. *Economic Development and Cultural Change*, 50(4), 935-59.
- Qian, Tang. 1994-5. Adult Education in China: Policies and Practice in the 1980s. *Policy Studies Review*, 13, 391-414.
- Wu, Xiaogang and Yu Xie. 2003. Does the Market Pay Off? Earnings Returns to Education in Urban China. *American Sociological Review*, 68 (3): 425-442.
- Xiao, Jin and Mun C. Tsang. 1999. Human Capital Development in an Emerging Economy: The Experience of Shenzhen, China. *The China Quarterly*, 157, 72-114.
- Xie, Yu and Emily Hannum. 1996. Regional Variation in Earnings Inequality in Reform-Era Urban China. *American Journal of Sociology*, 101:950-992.
- Xie, Yu, Yang Jiang, and Emily Greenman. Paper presented at the Population Association of America annual meeting in 2006.
- Zhou, Xueguang and Liren Hou. 1999. Children of the Cultural Revolution: The State and the Life Course in the People's Republic of China. *American Sociological Review*, 64, 12-36.

Appendix A: Descriptive Statistics by Age Group

Before 25	N	Mean	Std. Dev.	Min	Max
Ever in Higher Ed. by 25	1135	0.430	0.495	0	1
Male	1137	0.549	0.498	0	1
Party Member by 25	1137	0.107	0.310	0	1
Occupation	1102	2.906	1.092	1	4
Quiz Sum	1137	20.806	5.352	0	31
Same Sector	1137	0.748	0.434	0	1
Father's Occupation	767	2.954	1.522	1	5
Ever Sent-Down	1136	1.842	0.365	0	1
Married by 25	860	0.312	0.463	0	1
Birth Year	1137	55.556	15.153	3 (1903)	82 (1982)

Ages 25-34	N	Mean	Std. Dev.	Min	Max
Ever in Higher Ed. by 34	649	0.122	0.327	0	1
Male	649	0.508	0.500	0	1
Party Member by 34	649	0.206	0.405	0	1
Occupation	632	2.652	1.100	1	4
Quiz Sum	649	20.079	5.483	0	31
Same Sector	649	0.749	0.434	0	1
Father's Occupation	420	3.207	1.495	1	5
Ever Sent-Down	648	1.821	0.384	0	1
Married by 34	494	0.935	0.246	0	1
Birth Year	649	54.097	15.031	3 (1903)	82 (1982)

Ages 35-43	N	Mean	Std. Dev.	Min	Max
Ever in Higher Ed. by 43	570	0.058	0.234	0	1
Male	570	0.495	0.500	0	1
Party Member by 43	570	0.230	0.421	0	1
Occupation	553	2.618	1.102	1	4
Quiz Sum	570	19.770	5.533	0	31
Same Sector	570	0.753	0.432	0	1
Father's Occupation	366	3.298	1.481	1	5
Ever Sent-Down	569	1.845	0.362	0	1
Married by 43	419	0.976	0.153	0	1
Birth Year	570	54.565	15.404	3 (1903)	82 (1982)

Appendix B: Future Work for this Project

1. Create person-year variables for party membership, marriage, childbirth, and possibly migration
2. Create variables for person-years 44-60 to include the latest junior college graduates
3. Re-think the occupational coding schemes
4. Incorporate more variables or models; fix same-sector variable
5. Try to identify or deduce the age-structure of the Chinese population currently enrolled in higher education from the census data
6. Improve paper's organization and tighten argument
7. Write a second paper estimating returns to education by education timing, adjusting for selection bias using propensity scores for probability of on-time education and comparing returns to adult education with those from other societies
8. Consider the relationship between timing of graduation and timing of retirement?
9. The pink line represents the number in the cohort with a university-level education (not necessarily a degree???) in 2000 according to census data. The blue line divides the number of university degrees awarded in a year by the number of people age 22 in that year. How is this possible?

