Does Knowledge Change Fate?
Study on the Effect of Education on Hukou Mobility in China

Xiaoqi Yu

Hua is accepted into Peking University,
Ping is studying in Technical High School,
I'm working as a cashier near my home,
We' all have promising future.

——P253, Integrated Social Study, 8st Grade. People's Education Press, Beijing

INTRODUCTION

Social status is an important index indicating wealth, health, access to materials and resources, and one's fame in a society (Deary 2005). The relationship between education and social status have been widely discussed in economics and sociology literature (Deary 2005; Fleisher 2004; Fu & Qiang 2010; Greenstone 2013). Various studies showed that individuals received better education are expected to gain higher salary over the lifetime and more likely to move upward in social status. Deary's study on social mobility in Scotland found out that one's social class of origin accounted for about one quarter of the variance in social status at age 33, whereas ability, motivation and qualifications, which can be attained by Education, accounted for over 60% of variance in social class at age 33 (Deary 2005). Similar cases happen in China. As people always saying Knowledge Changes Fate, Li's study on the distribution of income for individuals in China during 1988 to 2003 shows that the wage growth for people receiving higher education is significantly faster than others (Li 2007), indicating that education can be a good predictor for social status at midlife.

In the case of China, an important aspect of social status is one's Household registration, called *hukou* system (Afridi 2015; Fu 2010). There're two types of hukou, the Urban and the Rural, which divide people into different levels of geographical and social mobility, educational and career opportunities, medical resources, and insurance benefits (Fu 2010). One's Hukou is determined by his or her birthplace and parental hukou status, rather than by his or her residency or occupation. Consequently, the hukou system promotes inequality in social status by favoring one individual with an urban hukou over another with a rural hukou (Fu 2010). In rare cases, rural hukou holders are eligible to apply for change their hukou into urban hukou. The common

ways to change hukou include going to a national key university, or proving their permanent residency through having business with certain size or finding white collar jobs with long term contract (Chan 2010). Since the inequalities wildly exist between rural and urban hukou holders, if one would be able to change his or her hukou from rural to urban, it is considered that he or she has move upward in social status.

Various previous researches have studied the different aspects of inequality between holders of the rural and the urban hukou. However, little studies have investigated the mobility from the rural hukou to the urban hukou. Some people believed that the most effective way of achieving hukou mobility is through education. After the college entrance exam was restored in 1977, stories about people from some small villages with farming parents and poor neighborhood grew up to be professionals, businessmen, celebrities and role models by working hard in rural high schools and getting into key universities are frequently heard on Chinese media and from people's talks (Wang 2010). However, some studies also suggest that the return on education in China is still low compared to other transition economies (Fleisher 2004). A natural hypothesis to propose here is that education changes fate, which can be specified into receiving better education increases one's odds of changing hukou from rural to urban. Although this hypothesis was largely confirmed by comparing two groups of people currently living in urban area who used to have rural hukou, with one group achieved hukou mobility and got the urban hukou and the other group remain with their rural hukou, the finding also suggests that education might be not the most powerful predictor for the hukou mobility.

METHOD

Participants and Materials

This research aims to investigate the relationship between education and hukou mobility by using responses from the CHIP 2002 datasets (Li 2015). The survey was conducted in 2002 by Beijing Normal University on general Chinese Household Income in 29 out of 32 provinces in China aiming to estimate the distribution of incomes and other economical factors. Ten datasets collect responses to ten questionnaires on demographic and socioeconomic situations of different groups of people and families. This study purposely chose responses from people currently living

in the urban area but originally from the rural area and thus were born with rural hukou. By doing so, the study can investigate the hukou mobility because all participants have rural hukou initially. Following such guideline, dataset 1 and 9 were chosen for the study. Dataset 1 collected responses from 20632 individuals who reside permanently in the urban area, in which all of them hold urban hukou except for some senior citizens who are living with their children. Individuals who responded that they changed their hukou from rural to current urban residence were future chosen from Dataset1. These individuals, achieved hukou mobility, formed the urban group for the study. Dataset 9 collected responses from 5327 people who hold rural hukou but are currently working in the urban area. They formed the rural group for the study because they remained their rural hukou even though they have migrated to urban area. By comparing urban group with rural group, the factors that influence hukou mobility will be understood.

Although the questionnaires for the two groups are different, they both collected various informations about individuals. The ones that are investigated in this study include age (in year), gender (in Male and Female), monthly income (in yuan), occupation, type of working contract, educational level, year of education received (in year), and the year of migrant to the urban area (in year). The occupation is coded into eight categories; ordering from higher skilled to level skilled jobs, they are director of government agent/institute and enterprise, professionals, clerical staff, skilled worker, unskilled worker, Service worker, self-employed or owner of private business and none. The skilled workers are those who need formal training and get the working certificate to work; the unskilled workers do not need training or certificate, indicate lower level jobs compared to skilled workers. The service worker includes housekeeper, servant, salesclerk, who usually work without contract and are expected to receive minimum wage. The type of contract is coded into five levels; from long time to short time, they are permanent, long term, temporary, self-employed, and none. The educational level was coded into seven levels indicating the highest type of school an individual finished; from high to low, they are college and plus, professional/junior college, technical middle school, senior middle school, junior middle school, elementary school, and none. For those in the urban group, their ways to change their hukou (including “going to college” and “proving permanent residency”) are recorded. Since the geographical mobility without government approval was not possible in Mao’s era

(Afridi 2015), people migrated before the year of 1979 are excluded. Considering that people under 19 might have not yet started their higher education or begun to work, and people over 70 might already retired but migrated to urban area with their children, the study future limits participants within age 19 and 70 on purpose. The total population studied is then 2265 for urban group and 3885 for rural group.

Statistical Methods

First, in order to have an general the educational, occupational, and income gap between urban and rural groups, for each hukou group, gender, educational level, occupation, and type of contract were summarized as percentage distribution of each categories. The mean, median and standard deviation of monthly income, age, and year of education received by both groups were summarized. Potential collinearities were then checked; no numerical variables have the absolute value of r greater than 0.5, so they can be considered together when building the model.

To build the model, individuals who have No Response (NAs) to any question in survey were excluded in order to keep the null deviance for different models to be constant. A simple logistic regression was first tested using education as the only predictor variable and binary variable hukou as response. A multiple logistic model was then implemented to analyze the relationship between education and the odds of getting urban hukou after adjusting for occupation. age, contract, gender, and other potential predictors. A Wald test was done to test the significance of every explanatory variables for each model. The AIC values for each model using different predictors were compared and the model with smallest AIC and all predictors statistically significant was selected. Finally, in order to compare the effectiveness of education on hukou mobility to the effectiveness of other factors used in the multiple logistic model, simple logistic regressions were used by setting predictor variable to be each individual predictors used in the multiple logistic model. By comparing drops from null deviance and AIC values of these models, the effectiveness was compared.

RESULT

Significant gaps of educational levels and job opportunities between urban and rural hukou holders were found. The sample contains survey from 2265 individuals in urban group

and 3883 individuals in rural group. Appendix A provides summary statistics for education, occupation, and type of contract as percentage distribution of people in different levels for both groups. The percentage of people who receive at least Senior and Technical middle school education is 66.68 for urban group and 17.86 for rural group. 10% of rural hukou holder did not finish elementary school while only 1.38% of urban hukou holder did not finish. Only 6.74% of rural hukou holder currently working white collar job including director of Government Agent, institution, and enterprise, clerical and office staff, and professionals. This number is 55.21% for urban hukou holders. 53.10% of rural group are self-employed compared to 37.77% for urban group. 74.32% of urban hukou holders have long-term (above 5 years) and permanent working contract, compared to 5.28% for rural hukou holders. The median income of rural registration holder is about 72.1% of urban registration holder, indicating the income gap between the two groups. The rural group has median year of education and median age both three years younger than the urban group.

Potential collinearity was checked. For the entire sample, the correlation between year of education received and monthly income is 0.21, and the correlation between year moving to urban area and age is 0.27, meaning that they can coexisted in the model. The chi-square tests for comparing education levels and occupation, education levels and type of contract, and occupation and contract all give P values smaller than 0.05. Collinearity was hence not existed between the variables that will be studied.

Table 1. List of different Educational Levels to Predict the Odds of Getting Urban Hukou

baseline at college plus	Professional Junior College	Technical Middle	Senior Middle	Junior Middle	Elementary	None
Estimated	0.491*	0.120***	0.0466***	0.0119***	0.00439***	0.00132***
2.5%	0.266	0.0666	0.0265	0.00681	0.00238	0.000492
97.5%	0.861	0.204	0.0764	0.0194	0.00761	0.00304

* P value<0.05, ** P value<0.01, *** P value<0.001.

(Table 1. Result of simple logistic regression to predict the odds of getting urban hukou using educational levels. Listed were the exponentiated coefficient of slope and their significance level and 95% confidence interval. The baseline was set at completing at least college education. The

Estimated column shows estimated odds ratios of getting Urban hukou for people in each educational level compared to people who finish at least college education.)

The models studied 4838 people with 1552 people in urban group and 3286 in the rural group. Table 1 shows the result of simple logistic regression to to predict the odds of getting urban hukou using educational levels exclusively. The **Estimated** column demonstrate the association between the odds of getting urban hukou and highest educational levels received. The odds of getting urban hukou for people with highest education level at professional 49% (95% confidence interval CI:27% to 86%) of the odds of getting urban hukou for people who finish college and above respectively. For every level of decrease in education, the upward hukou mobility decreases significantly. For people in bottom education level who do not finish elementary education, the estimates odds of getting urban hukou is just 0.1% (CI:0.05% to 0.3%) of the odds of getting urban hukou for people who finish college. Considering that all levels have Estimated odds ratios statistically significant and that the odds ratios decrease significantly as level of education decrease, education is a powerful predictor for hukou mobility in China.

Table 2. Effectiveness of Predictor Variables in the Final Multiple Logistic Model

Variable	Null	Education	Age	Gender	Year of Migrant	Occupation	Contract
AIC	-------	4026.8	6004.4	6067.2	4273.2	3959.8	2932.3
Residual Deviance	6071.4	4012.8	6000.4	6063.2	4269.2	3943.9	2922.3

(Table 3. AIC values and Residual of models using each Predictor solely and of final multiple logistic model are listed. The Chi-square Deviance lists the drop in deviance according to the Chi-square test results of comparing the model excluding that variable to the final multiple logistic model)

The effectiveness of educational level in predicting hukou mobility was then compared to the effectiveness of other factors. The simple logistic regression using gender, year of migrant, age, occupation and type of working contract respectively are tested and the AIC values are listed in Table 2. The deviance drop by occupation alone and by job contract alone are greater than the deviance drop by education alone. Education might hence be less effective in predicting the hukou mobility compared to occupation and type of contract.

Table 3. List of Explanatory Variables to Predict the Odds of Getting Urban Hukou

	Estimated	**2.5%**	**97.5%**		**Estimated**	**2.5%**	**97.5%**
Gender***	4.09***	3.16	5.33	***Contract (baseline at long term contract)******			
Year of migrant***	0.818***	0.799	0.836	None	1.67*	1.01	2.80
Age***	1.04***	1.03	1.06	Self-employed	0.133***	0.0857	0.205
Occupation (baseline at Clerical Staff)***				Temporary	0.213***	0.151	0.300
Director	0.649	0.238	1.86	permanent	10.8***	5.96	20.6
professional	0.500*	0.274	0.907	***Education (baseline at college and plus)******			
Skilled	1.69	0.976	2.92	Professional/Junior college	0.610***	0.243	1.48
Unskilled	1.16	0.658	2.04	Technical Middle	0.288***	0.118	0.678
Service	0.697	0.410	1.18	Senior middle	0.113***	0.0483	0.254
Self-employed, private owner	0.392**	0.213	0.723	Junior middle	0.0417***	0.0178	0.0936
Other	0.206***	0.0979	0.421	Elementary	0.0156***	0.00625	0.0376
				None	0.00326***	0.00092	0.0104

* P value<0.05, ** P value<0.01, *** P value<0.001.

(Table 5.Result of multiple logistic regression to predict the odds of getting urban hukou for rural hukou holders. Listed were the exponentiated coefficient of slope with their Wald Test result of significance level and their confidence interval. The baseline and the Chi-square test results of significance for each variable were indicated after the variable names. The Estimated column shows estimated odds ratios of getting Urban hukou for people in each level compared to people in baseline level for that group after adjusting for other variables.)

Table 2 shows the result of multiple logistic regression to predict the odds of getting urban hukou using various factors including gender, year of migrant, age, occupation, type of working contract and education level. The **Estimated** values for Education demonstrate that,

after adjusted for other variables, the odds of getting urban hukou for professional & Junior college graduates is estimated to 0.610 (CI:0.243 to 1.479) times the odds for those who finish college and above. The odds ratios decreases as the educational level decreases, for those who did not even finish elementary school, their odds of getting urban hukou is just 0.3% (CI:0.09% to 1%) of those who finish college. The coefficients for all the estimated odds ratios are significant with P value smaller than 0.001. Hence, the multiple logistic model does not change the fact that the odds of achieving upward hukou mobility increases consistent with the increase in education level. However, the multiple predictors logistic model is still useful because drop the deviance of the sample from null deviance at 6071.4 to residual deviance at 1930.7, way more significant drop compared to 4026.8 of using education as the sole predictor.

As indicated in table 2, occupation and type of contract might be more effective to predict upward hukou mobility. The odds of upward hukou mobility are vastly different among different levels of occupation and among different length of contract. However, according to the level of significance listed for multiple logistic model in table 3, the P values for levels in occupation are not all significant. The odds ratios for categories under occupation and contract in the table also indicate that, unlike education for which the odds of getting urban hukou increase consistently as the levels of education increase, the odds of achieving upward hukou mobility do not increases consistently as the occupation increase from lower level jobs to higher level work, and as type of job contract increase from none to permanent contract. For example. people who work without contract should expected to have the lowest odds of getting urban hukou, however, the odds of getting urban hukou for them is 1.67 times the odds of getting urban hukou for people with long term contract after adjusting for other variables. Hence, although the occupation and contract might be more effective to predict upward hukou mobility, the applicability of predicting upward hukou mobility by occupation and contract is debatable and need to be future studied.

Discussion

In this study, it was confirmed that the educational level is a powerful predictor for rural to urban hukou mobility in China. The association between educational level and mobility of hukou can be generalized into connection between education and mobility in social status, such that more educated population are more likely to move upward in social status. The study also

found that education might be not as effective to predict such as occupation and type of working contract. However, considering the fact that unlike education is accessible for everyone, certain types of occupation and some permanent or long term contracts are only issued to people who already hold urban hukou, the applicability of predicting mobility by occupation and type of contract is still debatable. Furthermore, getting high level of occupation is usually considered as the consequence of upward social mobility, not the cause (Deary 2005). Hence, getting high level of education is a more reliable and applicable way to for people move upward in Chinese society. In fact, 37.9% of people in urban group answered that they get their urban hukou by going to college or professional school in urban area, which is higher than 34.1%, the percentage of people in urban group who actually finish college and professional school. Going to college can be thus considered as a guarantee to getting urban hukou.

As shown in the appendix A table, the urban group have higher percentage of having higher level job, longer contract, and higher level of education. Hence, occupation and type of contract can be confounding variables although Chi-square test shows that their no collinearity among them and education. One of reason for such Chi-square test result might be there are not actually many people in some of levels for occupation and type of contract. However, using them together in the multiple logistic model significantly drop the deviance and the AIC and increase the accuracy of prediction, and hence, they should be still included.

The summary statistics also found that the average age for both group are in mid-thirty. However, when building models, all people with age range 19~70 are considered. Considering that a lot of rural workers in urban area start to work at age young as 15, the actual difference of education between those two group might be greater. Some senior citizens in the urban group might get their urban hukou through their children who achieved upward social mobility, but those senior citizens, who might be actually illiterate, are counted as achieving mobility by themselves in the study, and hence increase the estimated odds ratio of achieving hukou mobility for those who have low levels of education.

This study assumed that upward mobility in social status can be specified into rural to urban hukou mobility. However, mobilities can be achieved in multiple ways. There are urban hukou holders who had been living in urban slam area for generations. From the assumption of

this study, they are considered having higher level in social status compared to all people who hold rural hukou. There are also government officials, or rich people living in the rural area, but they are assumed to have low social status according to the model. Hence, the study only shows one, but important facet of social mobility in China. The influence of education on other ways of social mobility, like moving from urban slam area and moving from middle class to upper class, should be also further investigated.

Some studies showed the reciprocal way that the gap in educational resources is also wide among different social status. The Hamilton Project by Brooks Institute (Greenstone 2013) studied the American family in 2013. The project found that even though the ability gaps of children between high income family and low income family are low, the achievement gaps are huge because of the huge investment gap on Education for children between high income and low income families. Greenstone believed that by investing high quality public education for low income communities, the achievement gap between children from different families can be narrowed. This study suggested that education can increase upward social mobility for people born in lower social class. Hence, beside further study on the influence of education on other ways of social mobility, it is useful to further study the educational resources gap between urban and rural area in China. Since education is a powerful way to encouraging upward social mobility, through realizing the existing educational resources gap can the government make better decision on investment in public education, and helping next generation eliminating poverty and inequality.

Reference

Afridi, Farzana, Sherry Xin Li, and Yufei Ren. "Social identity and inequality: The impact of China's hukou system." *Journal of Public Economics* 123 (2015): 17-29.

Chan, Kam Wing. "The household registration system and migrant labor in China: notes on a debate." *Population and Development Review* (2010): 357-364.

Deary, Ian J., et al. "Intergenerational social mobility and mid-life status attainment: influences of childhood intelligence, childhood social factors, and education." *Intelligence* 33.5 (2005): 455-472.

Fleisher, Belton M., et al. "Sorting, selection, and transformation of the return to college education in China." (2004).

Fu, Qiang, and Qiang Ren. "Educational inequality under China's rural–urban divide: the hukou system and return to education." *Environment and planning. A* 42.3 (2010): 592.

Greenstone, Michael, et al. "Thirteen economic facts about social mobility and the role of education." *The Hamilton Project, Brookings Institution, Washington DC.* (2013).

Li, Shi. "China Household Income Project 2002." *China Institute for Income Distribution*. Beijing Normal University, Web. 04 Nov. 2015. <http://www.ciidbnu.org/chip/>.

Li, Xiaohua, Yaohui Zhao, and Lili Lu. "Effects of education on wage inequality in urban China, 1988-2003." *The 6th PEP research network general meeting*. 2007.

Wang, Yimin, and Heidi Ross. "Experiencing the Change and Continuity of the College Entrance Examination: A Case Study of Gaokao County, 1996-2010."*Chinese Education & Society* 43.4 (2010): 75-93.

Appendix A

Table1, Summary of Educational Level, Occupation, and Type of Contract as Percentage for people with Urban and Rural hukou

Variable Name	Urban Hukou	Rural Hukou	Total
		Gender	
Male	45.25	51.24	49.1
Female	54.75	48.76	50.9
		Highest_Education_Level_Attained	
College and Above	13.68	0.60	5.26
Junior College or Professional School	20.43	1.45	8.22
Technical Middle School	12.14	3.25	6.41
Senior Middle School	20.43	12.56	15.37
Junior Middle School	24.65	48.16	39.78
Elementary School	7.31	23.10	17.47
Below Elementary School	1.36	10.88	7.48
		Occupation	
Director of Government Agent, institution, and enterprise.	11.18	0.48	3.96
Clerical, official staff	19.61	2.38	7.98
Professionals	24.42	3.88	10.56
Self-employed or Owner of Private Business	5.93	53.10	37.77
Skilled Worker	16.24	6.86	9.91
Unskilled Worker	9.24	8.15	8.51
Service Worker and Salesclerk	10.43	18.53	15.90
Other	2.93	6.62	5.21
		Type of Contract	
Permanent Position	53.82	0.51	17.57

Long Term Contract	20.53	4.77	9.81
Temporary Contract	9.94	25.16	20.30
Self-Employed	8.59	66.63	48.06
No Contract, Unknown	7.12	2.93	4.27
Total people Surveyed	**2265**	**3883**	**6148**

(Table 1, Distribution of gender, educational level, occupation, and type of working contract for Urban and Rural groups as percentage. The Educational Level is coded considering the highest education level received by a person. People who do not finish elementary education and who are illiterate are coded in the same category "Below Elementary". For the occupation variable, the workers are divided into Skilled worker, Unskilled worker and Service worker. The skilled workers are those who need formal training and get the working certificate to work; the unskilled workers do not need training or certificate, indicate lower level jobs compared to skilled workers. The service worker includes housekeeper, servant, salesclerk, who usually work without contract and are expected to receive minimum wage. For the contract variable, the self-employed category includes those who work independently as food or clothes vender, driver, recycling worker or who were currently taking break from seasonal and service work (Li 2015).)

Appendix B

Table 2, Summary descriptive statistics of income distribution and year of education distribution for Urban and Rural registration holder

	Urban			**Rural**		
	Mean	*Median*	*SD*	*Mean*	*Median*	*SD*
Monthly Income (mincome)	963.6	831.6	770.7	775.4	600.0	922.1
Year of Education Received (yredu)	10.99	11	3.70	7.81	8	2.88
Age (age)	38.44	37	10.20	34.98	34	8.92

(table 2. Mean, median and standard deviation of monthly income, age, and year of education received by urban and rural hukou holders)