Jasmine Trang Ha
9/25/2014

Intergenerational Ties, One-Child policy, and Fertility in China: Evidence from the 1982 and 1990 Census

I. Introduction

This paper utilizes the Chinese Census data for 1982 and 1990 and addresses two questions: (1) How does the relationship between intergenerational ties and fertility look like before and after the One-Child Policy was implemented?; and (2) Are there variations at two time points, in 1982 (3 years after policy implementation) and in 1990 (11 years after policy implementation)?

In this study, I view intergenerational ties as a proxy for cultural ideal that encourage fertility. Co-residence with parents would provide the couple with a direct link to tradition and cultural expectations of the previous generations (Chen 2005). When it comes to fertility of adult daughters, the role of mothers are especially important, as mothers are usually the main providers of informal care and the main transmitters of norms and values regarding fertility (Chen, Short & Entwisle 2000; Chen, Liu & Mair 2011). At the same time, the mother's (and mother in-law's) fertility is a strong signal of the type of values and fertility preference that they would like to transmit (Chen, Yi, Cai & Gu 2011). As such, this study views co-residence with mothers and mother's fertility as a measure of pro-natalist cultural influence on the adult daughter's fertility.

## II. Theoretical Considerations

a. Background

China national total fertility rate (TFR) used to be very high, standing at approximately 5.8 children per women in mid-1950s through 1960s (Peng 1989), and China's patriarchal, pro-natalist culture has often been cited as reasons for preference of high fertility – in that more children/grandchildren and especially sons would signify prosperity and good fortune of the family (Zhao 1997). Together with the global fervor regarding the "population bomb" and daunting problems associated with over-population, the Chinese government had decided to take action: they implemented an anti-natalist policy in 1979 to restrict fertility level, which was known to popular culture as the "One-Child policy".

The policy is fundamentally a population control program that sets a quota on the number of children that a couple can have. For most families, the quota is one child, although there are several exceptions and the Chinese government continued to make changes to the policy over time. Violation of the child-quota often resulted in heavy fines, and some provincial governments went into extremes such as monitoring women's menstrual cycle and forced abortions to maintain the quota (Nie 2005). It is important to note that although the child-quota is set by the Chinese central government, implementation varies a great deal geographically, as the provincial governments get to determine how much the fine will be and how strictly they would enforce the policy (Hesketh, Li and Zhu 2005). At the same time, the government makes exceptions to the rule to balance population needs. For example, minority ethnic groups are often encouraged to have two or more children; agricultural families are allowed to have two children if the first born is a girl – a move in

recognition of the importance of male labor in farming families. The latest exception was announced on November 15, 2013 where they allow couples where either spouse is an only child to have two children (Castillo 2013).

While it has stirred up several controversy regarding human rights, coercive abortion, and sex-selective abortion, the One-Child policy is also widely known for its impressive achievement in population control. TFR in China went down to 2.3 in the early 1980s (Peng 1989). In the government rhetoric, the policy is seen as short-term measure to motivate cultural changes and help Chinese couples move towards a voluntary small-family culture (Hesketh, Li & Zhu 2005). Some research have shown this to be true among the urban population, as families in big cities expressed desire for just one child and no sex preference due to the high cost of living and adjustment to the new culture of nuclear family (Cai 2010; Merli & Morgan 2011). However, it is not clear whether the policy has changed the cultural impacts on fertility and fertility preference on a national scale.

b. Determinants of fertility patterns and the role of policy
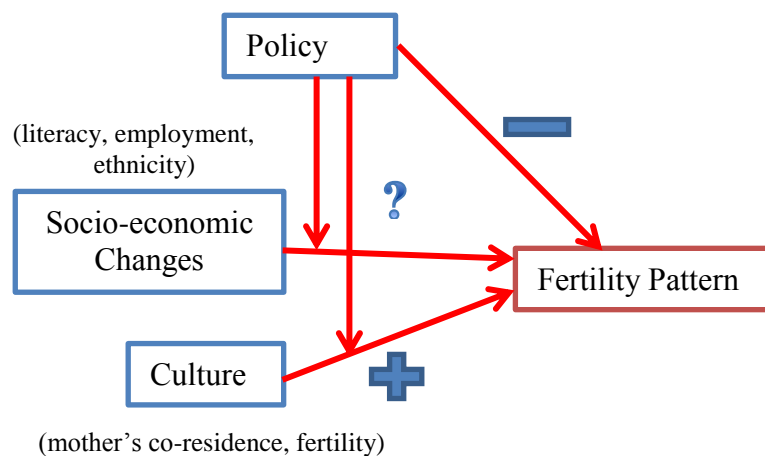
Figure 1: Determinants of fertility pattern

Figure 1 above helps us see the broad picture. Policy, socio-economic changes and culture are three main factors that influence fertility patterns (Bongaarts 2008, 2011). Socio-economic changes refer to transformations in the social and economic structures, which include economic growth, women's participation in labor force, change in social values and gender roles, etc. They could influence fertility in multiple ways, and especially for China, the impact is unclear. On one hand, changes in the economic structure have made women better educated and brought them outside the home for formal employment. On the other hand, however, the social institutions did not change that much, as gender inequality and patriarchal, male-centric practices are still the norms both in the work place and at home. Culture in China is clearly pro-natalist, as traditional values would promote having more babies (and especially sons) to carry on one's linage (Zhao 1997). The policy's intention was also clearly oriented towards discouraging fertility growth. In fact, it was framed as initiative to promote cultural changes. The question, then, is: How had the impact of culture on fertility change after the One-Child-Policy was implemented?

III. Data & Method

a. Data
This study uses Chinese census 1982 and 1990 data that are made available by the IPUMS-International project (Minnesota Population Center, 2014). Both are representative 1% sample of

the full-count census. As fertility information is only available for females between age 15 and 64 and extra-martial fertility were relatively rare in China at that time, I limit my sample to married women aged 15 to 64 in both Censuses.

b. Variables

The focal dependent variable is number of children born by the women that are still surviving. The reason I picked this variable over another variable capturing number of children ever born is due to the fact that policy is enforced based on the number of living children only.

In terms of intergenerational ties, I look at whether the mother or mother in-law co-reside with the adult daughter in the same household, using the IPUMS-I constructed family interrelationship variables (mom location and spouse location). Where mothers co-reside with adult daughters in the same household, I capture mother's fertility (measured by number of children ever born by the mother) and estimate the relationship between mother's fertility and daughter's fertility. Mother and mother in-law might have different cultural significance, given the patriarchal tradition in China. However, due to limitation of data, we cannot accurately disentangle whether the mother is truly the women's own mothers or mother in-laws. And as such, this study will not be able to touch on that that complexity. Nevertheless, it is important to recognize that mothers' presence and fertility (regardless of the in-law status) is an important source of cultural expectations from the previous generation that Chinese women are exposed to. It is also important to note that the two variables, children ever born and children surviving are almost identical to one another among the younger population. I use children surviving for adult daughter's fertility because the policy is enforced based on the number of living children, but children ever born is used for mother's fertility as that would reflect lifetime fertility of elder women.

To disentangle the policy effect, I employ the synthetic cohort concept, i.e. treating the age distribution of the population as if it were a cohort passing through time (Yang & Land 2913). Specifically, I pick out women who were born before 1938 in both census samples. If one was born before 1938, that means she was already older than 40 in 1979 when the policy was implemented. According to literature, around 1980s and 1990s, Chinese women typically finish childbearing at around 35-40 years old. As such, it is likely that she has already completed childbearing and therefore her fertility was not affected by the One-Child Policy.
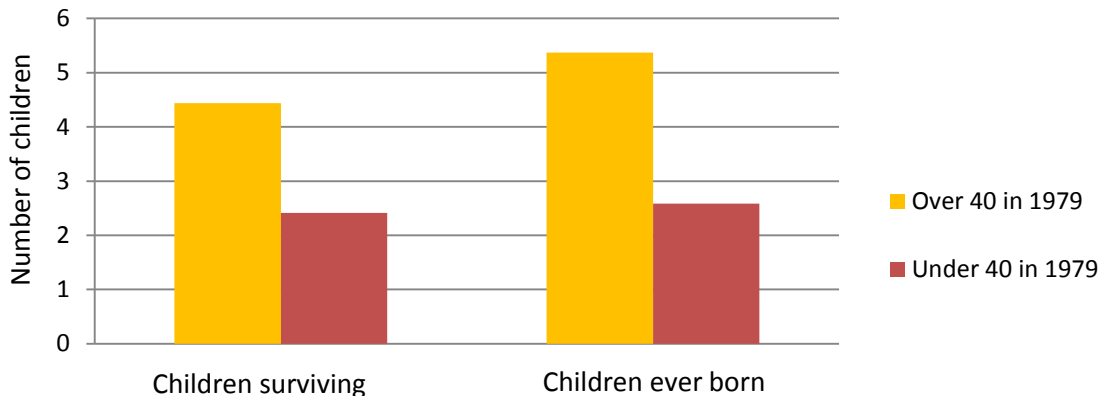

Figure 2: Fertility of those born before and after 1938

Figure 2 above shows difference in fertility between women who are above and below 40 years old in 1979. The yellow block shows fertility of those who are beyond 40 years old in 1979, and the red blocks show those who are below 40 years old at the implementation of One Child Policy. Fertility rate are starkly different, fertility of those finished childbearing before 1979 twice of those who are still in reproductive ages. T-tests show that differences are statistically significant. However, the limitation of this analysis is that the group of women born after 1938 would be much younger and might not have completed their fertility. In order to speak to specific changes fertility behavior, I also perform an analysis on women in the same age group in two Census years.

Additionally, I also capture the impact of socio-economic changes on women through measures of literacy, employment status, and ethnicity.

c. Models and hypotheses

My first analysis will test two hypotheses. First, I hypothesize that (H1) *co-residence with mother will be associated with an increase the probability of the adult daughter having more than one child, and that this effect will hold when controlling for socio-economic characteristics of literacy, employment, and ethnicity.* Second, I propose that (H2) *implementation of the One-Child policy will be associated with a change in the relationship between intergenerational co-residence, in that the relationship will disappear or change in direction (from positive to negative).* I use a logistic regression on a pooled sample of both census years, and stratify the sample into two groups of women, one consisting of those born before 1938 (and hence would have completed childbearing before the One-Child policy implementation) and the other are those born after 1938. As mentioned above, the independent variable of interest is intergenerational ties measured by co-residence with mother or mother in-law. The models also control for women's literacy, age, employment and ethnicity – factors that would reflect some aspects of socio-cultural changes in women's status and are known to affect fertility. Table 1 summarizes the descriptive characteristics of the sample.

Table 1: Descriptive Characteristics, Married women age 15-65 in China's Census 1982 and 1990

Variable	1982	1990
Number of children surviving	3.26	2.71
Age (15-64)	39.58	38.63
Literacy (1=Yes, 0=No)	0.43	0.67
Employment (1=Employed, 0=Unemployed or Inactive)	0.73	0.80
Ethnic Han (1=Han, 0=Other)	0.94	0.93
Mother lives in the same household	0.16	0.16
Born before 1938 (1=Yes, 0=No)	0.37	0.18
N = 4,759,971	2,013,242	2,746,729

With the second model, I advance the analysis further by investigating a new independent variable: mother's fertility, which could be seen as a proxy for the embedded pro-natalist cultural value that encourages fertility of the adult daughter. Due to limitation of census data that groups individuals by household, I can only determine the mother's fertility if she co-reside with her adult daughter. As such, the second analysis is applied on a smaller sample of married women aged 15-64 who co-reside with her mother or mother-in-law. I hypothesize that (H3) *the number of children ever born by mother will be associated with an increase in the probability that the adult daughter has more*

than one child, and that this effect will hold when controlling for socio-economic characteristics. To avoid the One-Child policy impact, I only perform the analysis on married women who are born before 1938 (those who have completed childbearing before the policy). Another limitation of this approach is that fertility data is only collected among women aged 15 to 64. That means data is not available for elderly mother older than 65. As such, the sample size is very small (N=259).

Lastly, I perform a Poisson regression to understand the effect of mother's fertility on adult's daughter fertility. I limit the sample to those between 25 and 35 years old so as to capture fertility in the almost-finish stage. Additionally, the mothers of women in this group are more likely to be younger than 64 so that their fertility data is available. With two time points (1982 and 1990), I also seek to understand the effect of One-Child policy over time. Table 2 below shows that average number of children for women between age 20 and 35 in 1982 and 1990. We can see that although the two figures are quite close, but the fertility of 1982 is slightly higher than that of 1990. T-test shows that the difference is significant at p<0.001.

Table 2: Average number of children by age groups, 1982 and 1990

	Children surviving	
	1982	1990
Age 25-35	2.23	1.8
Age 20-35	2.03	1.65

I hypothesize that (H4) *after the One-Child policy is implemented, the number of children ever born by mother will not be positively associated with the adult daughter's number of children.* Also, I propose that (H5) *there will be a difference in the association between mother's fertility and daughter's fertility in 1982 and 1990.* Table 3 summarizes the characteristic of this sample:

Table 3: Descriptive Characteristics of Sub-Sample, married women age 25-35 who are co-residing with mothers

Variable	Mean
Number of children surviving	1.53
Age (25-35)	27.8
Literacy (1=Yes, 0=No)	0.83
Employment (1=Employed, 0=Unemployed or Inactive)	0.95
Ethnic Han (1=Han, 0=Other)	0.93
Census year 82 (1=census 1982, 0=census 1990)	0.43
Mother's number of children born	4.7
N = 17,145	

I. Findings

Table 4 reports the result from the first analysis, which is a logistic regression for the odds of having more than one child for two sub-groups. The first group is women born before 1938; and the other group is women born after 1938.

Table 4: Logistic regression, married women's odds of having more than 1 child, two subgroups

	Born after 1938	Born before 1938
Co-reside with mother	0.888***	1.098***
(0 = mother is not in household)	(0.00)	(0.03)
Age	1.178***	0.955***
(15-64)	(0.00)	(0.00)
Literacy	0.737***	1.134***
(0 = Illiterate)	(0.00)	(0.01)
Employed	1.047***	1.195***
(0 = unemployed or inactive)	(0.01)	(0.01)
Ethnic Han-Chinese	0.789***	1.189***
(0 = not ethnic Han)	(0.01)	(0.02)
N	3,519,022	1,240,949
Pseudo R-squared	0.15	0.01

As the table shows, the direction of the relationship for mother's co-residence, employment and ethnicity are completely opposite for two groups. There is evidence that policy is possibly working here: co-reside with mother has a negative relationship, so did employment and being Han-Chinese. We know that policy is stricter among those who are Han and those who are formally employed, so that might explain the change in relationship. Employment and ethnicity became constraints rather than resources. Co-residence with mother has also changed in direction, perhaps living with mothers have become more of a burden rather than resource for adult daughters' fertility, especially when the cost of having an additional children includes paying hefty fines. The results confirm hypotheses (H1) and (H2); suggesting that co-residence with mothers has positive association with adult's daughter fertility before but not after the One-Child Policy is implemented.

It is challenging to dis-entangle the associate of mother's fertility and daughter's fertility from the One-Child policy effect, as Table 5 below show the result from the small sample of women born before 1938. There is a positive relationship between mother's fertility and adult daughter's fertility, but this relationship is not statistically significant. As such, hypothesis (H3) is not confirmed.

Table 5: Logistic regression, married women born before 1938, odds of having more than 1 child

	Women born before 1938
Mother's number of children ever born	1.04
Age	0.88
(15-64)	
Literacy	0.77
(0 = Illiterate)	
Employed	1.27
(0 = unemployed or inactive)	
Ethnic Han-Chinese	1.82
(0 = not ethnic Han)	
N=	259

In the next model, I will focus on the group of women who were between age 25 and 35, and look at the effect of mother's fertility on that of adult daughters. I performed separate analysis for each census year. The table below shows descriptive characteristics of the smaller sample, as we only know mother's characteristics if mothers live in the same household. For this reason, the

Analysis considering the association between mother's and adult daughter's fertility is shown in result table below. The effect of mother's fertility is different at the two time point. For year 1982, mother's fertility is negatively associated with adult daughter's fertility, while the relationship is positive in 1990. All other relationships remain stable. It is possible that policy might have a stronger impact in the years following its implementations, thus explaining the negative relationship between mothers and daughters' fertility. As time goes by and people re-adjust to the reality of the policy, cultural values then regain its relevance. The result thus partially confirms hypothesis (H4) in that mother's fertility does not have positive association with daughter's fertility after the One-Child Policy is implemented. However, this is only true for year 1982. It is possible that the Policy is enforced most strongly in the first few years, focusing on family with a history of strong reproduction. As the relationship is different between 1982 and 1990, it also confirms hypothesis (H5), suggesting that pro-natalist culture through the proxy of mother's fertility does still have its impact even when the One-Child policy is in place.

Table 6: Poisson regression, number of children surviving, married women age 25-35, who are co-residing with mother.

	1982	1990
Mother's number of children ever born	-0.00835**	0.0170***
	(0.00)	(0.00)
Age	0.0834***	0.0240***
(15-64)	(0.00)	(0.00)
Literacy	-0.202***	-0.286***
(0 = Illiterate)	(0.01)	(0.02)
Employed	-0.117***	-0.0585**
(0 = unemployed or inactive)	(0.02)	(0.02)
Ethnic Han-Chinese	-0.184***	-0.164***
(0 = not ethnic Han)	(0.02)	(0.02)
N	6,963	10,182
Pseudo R-squared	0.25	0.10

II. Discussion

The ability to link individuals with parents in the Census data provided by IPUMS-International has given a great opportunity for analysis of intergenerational ties and its impact on fertility. I have outlined the impact of One-Child policy on that relationship: that is, after the Policy is implemented, determinants of fertility changes significantly. Co-residing with one's mother is not associated with stronger fertility of the adult daughter anymore. Similarly, characteristics that could be seen as "privilege" such as being employed, and being Han by ethnicity do not provide support for high fertility after policy implementation.

There is also evidence that mother's fertility as a proxy of pro-natalist culture has different relationship with daughter's fertility in 1982 and 1990; which may indicate some degree of adjustments to the policy. While we do not have enough variables to single out the policy's

impact, an insight into how intergenerational ties are transformed with social policy and socio-economic developments in the country is helpful in envisioning future research to get at the "cultural" determinants of fertility.

In my further analysis, I will further refine the models and will add geographic locations as well as occupational variations into the existing model to understand other factors that might impact both policy enforcement and fertility patterns.

Bibliography

Bongaarts, John. 2008. "Fertility Transitions in Developing Countries: Progress or Stagnation." *Studies in Family Planning* 39: 105-110.

Bongaarts, John. 2011. "Can Family Planning Programs Reduce High Desired Family Size in Sub-Saharan Africa?" *International Perspectives on Sexual and Reproductive Health 37:* 209-216.

Cai, Yong. 2010. "China's Below-Replacement Fertility: Government Policy or Socioeconomic Development?" *Population and Development Review* 36(3):419-440.

Castillo, Mariano. 2013. "China to ease one-child policy, abolish labor camps, report says." *CNN news report* on November 16, 2013. Retrieved on Dec 12, 2013 from http://www.cnn.com/2013/11/15/world/asia/china-one-child-policy/

Chen, Feinian, Guyangya Liu and Christine Mair. 2011. "Intergenerational Ties in Context: Grandparents Caring For Grandchildren in China." *Social Forces* 90(2): 571–594.

Chen, Feinian, Susan Short and Barbara Entwisle. 2000. "The Impact of Grandparental Proximity on Maternal Childcare in China." *Population Research And Policy Review* 19: 571–590.

Chen, Feinian, Yingchun Yi, Yong Cai, Zhenzhen Zheng, and Baochang Gu. 2011. "Do Parents Matter? Intergenerational Ties and Fertility Transition in a Low Fertility Context." Paper presented at the 2011 *Annual Meeting of Population Association of America* at Washington DC.

Chen, Feinian. 2005. "Residential Patterns of Parents and Their Married Children in Contemporary China: a Life Course Approach." *Population Research and Policy Review* 24: 125-148.

Hesketh, Therese, Li Lu and Zhu Wei Xing. 2005. "The Effect of China's One-Child Family after Policy 25 Years." *The New England Journal of Medicine* 353(11): 1171-1176.

Merli, Giovanna M. & S. Philip Morgan. 2011. "Below Replacement Fertility in Shanghai." *Population* 66(3-4): 519-542.

Minnesota Population Center. *Integrated Public Use Microdata Series, International: Version 6.3* [Machine-readable database]. Minneapolis: University of Minnesota, 2014.

Nie, Jing Bao. 2005. *Behind the Silence: Chinese voices on abortion.* Rowman & Littlefield Publishers, Inc.

Peng, Xizhe. 1989. "Major Determinants of China's Fertility Transition." *The China Quarterly* 117: 1-37.

Yang, Yang and Kenneth Land. 2013. *Age-Period-Cohort Analysis: New Models, Methods, and Empirical Applications.* Florida: CRC Press, Taylor & Francis Group.

Zhao, Zhongwei. 1997. "Deliberate Birth Control under a High-Fertility Regime: Reproductive Behavior in China Before 1970." *Population and Development Review* 23(4): 729-767.