Analysis on the Determinants of Divergence between Fertility Desire and Childbearing Behavior of Women in China

Jing Xu

Renmin (People's) University of China

Center for Population and Development Studies

Introduction

China has experienced the conspicuous fertility decline since 1970's due to fertility control policy implemented. The fertility control policy aimed to keep the fertility level down and decrease the total population amount. The total fertility rate declined from 4.95 in 1972 to 2.72 in 1979 sharply, added up to decrease 56 million population of birth during this time. The TFR kept the decline trend with fluctuation and went down to 2.35 in 1989 and to 2.31 in 1990. China came to low fertility countries of the world since 1991. The TFR sneaked into the replacement level in 1992 and dove to 1.82 which was below the replacement level in 1997. Then, it remained 1.8 or so in 2000 (National Population and Family Planning Commission of P. R. China, 2001[1]).

The official and demographers can not figure out the accurate TFR about the low fertility level in China since 2000, because the quality of fertility data had deteriorated. However, the majority agreed that the point of view of fertility which is below the replacement level（Xiaochun Qiao, 2005[2]）. Some scholars summed up the estimated TFR within a range of 1.2 ~ 2.3（Guangzong Mu et al. , 2005[3]）. < World Population

Jing Xu
Doctoral Candidate
Center for Population and Development Studies,
Renmin (People's) University of China
No.59 Zhongguancun Street, Haidian District, Beijing 100872, P.R. China.
Tel: 86-13811857532; 86-10-62518758
Email: xujing1023ruc@gmail.com; xujing20040331@126.com

Prospects: The 2008 Revision> published by Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat online shows that the estimated TFR in China is 1.77 during the period of 2000 ~ 2010 (UN, 2008[4]). Many demographers argued about fertility data which published in official report and estimated TFR by various indirect estimation methods. Most TFR estimations show that China now has a below replacement fertility ranged of approximately 1.6 ~ 1.8 (Zeng, 2007[5]). The latest estimation indicates that TFR has been reached between 1.4 ~ 1.6 (S. Philip Morgan, Guo Zhigang & Sarah R. Hayford, 2009 [6]).

Fertility desire is a value that develops under certain socioeconomic cultural and political conditions, reveals people's wills and desires on the number of children, quality of children, childbearing time and children's gender, reflects objective factors which influence childbearing, is one of important determinants that affect childbearing behavior (Fishbein, 1973[7]; Pritchett, 1994[8]), and is an important basis to make population planning and goal scientifically. As a social phenomenon, fertility or childbearing has "three-dimensional characteristics": quantity, time and gender (Baochang Gu, 1992[9]).

Childbearing behavior diverges from fertility desire at the modern developed and developing countries which located the different demographic transition period (Bonggarts, 2001[10]). But the empirical experience thought that individual intentions about future fertility are significant predictors of future behavior（Bumpass, 1987[11]; Rindtuss, Morgan, & Swicegood, 1988[12]; Thomson, 1997[13]; Westoff & Ryder, 1977[14]）. However, meta-analyses have shown that intentions alone are not sufficient to predict behavioral change satisfactorily (Sheeran, 2002[15]), as they leave large amounts of behavioral variance unexplained. This phenomenon has been labeled "Intention–Behavior Gap" (Urte Scholz et al. , 2008[16]).

In post-transitional society, new insight about the discrepancy and causes between fertility level and fertility desire with cross-sectional evidence obtained from recent

surveys in 42 developing and 12 developed countries demonstrates that the observed level of fertility exceeded desired fertility level in the early or middle stages of population transition of many countries, in reverse, the observed level of fertility was lower than desired at the end of transition （Bongaarts, 2001[10]）. Whereas, there is a positive relation existed between observed fertility level and desired fertility level.（Coleman, 1996[17]; Westoff, 1991[18]; Westoff et al. , 1987[19]） One chart in this paper shows that the diverging trend of TFR and desired family size in Thailand during the time of 1968 ~1993（Knodel et al. , 1996[20]）.

Childbearing behavior diverged desired fertility among women of childbearing age in China since 1990's （Juhua Yang, 2008[21]）, which represent the widening gap between low fertility level and desired fertility level. There is a certain gap between the desired fertility rate of women of childbearing age and the observed fertility rate published by office obtained from the results of 1997, 2001, 2002, 2006 and 2007 Surveys. For example, the desired fertility rate of women of childbearing age is 1.88 in 2007, and the observed fertility rate is 1.43, the difference of both is 0.45. Moreover, the results from National Urban-Rural Resident Fertility Desire Survey in 2002 and National Social Conditions and Public Opinion Polls on fertility desire of residents in 2007 show that two children are the ideal number of childbearing and one son with one daughter is the ideal sex structure of childbearing, which are most couples expected.

Literature Review

There are some inferential statistics researches on the determinants of fertility desire, childbearing behavior and fertility rate. In the early 1987, some scholars used Path Analysis on the effects of total fertility rate compared social economic development with Family Planning Policy（Dudley Poston and Baochang Gu, 1987[22]）. Other scholars make an analysis on the relation of social economic structure and fertility rate based on

community level data（Dudley Poston and Zhongke Jia, 1989[23]）. One scholar uses multilevel logit regression model to decompose the determinants of fertility probability on parity（Fengyu Zhang, 1998[24]）, one scholar uses Kaplan-Meier survival analysis and Cox proportional hazard model to decompose the determinants of age intervals of first marriage and first childbearing（Zhenzhen Zheng, 1999[25]）, one scholar uses linear structural model (LISREL) to examine the multi-dimensional impact of childbearing behavior, which display the correlation between family variables at micro level, community variables at maso level and family planning policy variables at macro level（Yuan Ren, 1999[26]）. Some scholars introduce "fertility desire" as categorical variable into logistic regression model to decompose the determinants of childbearing behavior (Robert Schoen et al. , 1999[27]）, some use "penalty amount of exceeded the stipulated limit of the birth-control policy" as an indicator of operational intensity of fertility control policy and introduce it into linear regression model to estimate the influences that birth control plays on fertility rate (Tao Yang, Marjorie McElroy, 2000[28]), some use Easterlin's model to test the mechanism of socioeconomic variables and medium variable affecting fertility rate(Wei Chen, Mei Shi, 2002[29]). One scholar uses factor analysis method to re-examine the relationship of development, Family Planning and fertility rate（Wei Chen, 2005[30]）, some use structural equation model and introduce "fertility desire" as a latent variable to quantify the determinants of the floating women's childbearing behavior in Shenzhen city （Jiehua Lu et al. , 2005[31]）, some use Poisson regression model to decompose the determinants of fertility rate and childbearing behavior (Zhigang Guo, Xiwei Wu, 2006[32]), some use hierarchical linear model to examine the factors on fertility interval of two children in rural （Zhigang Guo, Jianjian Li, 2006[33]）, some examine the individual and regional factors of ideal family size using multilevel binary and ordered logistic regression models (Maria Rita Testa, Leonardo Grilli, 2006[34]), one scholar use non-linear multilevel model to test the effects on sex ratio of birth by fertility policy （Zhigang Guo, 2007[35]）, some of them use discrete choice model and introduce "altruistic factor" to decompose the determinants of women's fertility desire of in China (Zi Chen, Changrong Deng, 2007[36]), and some use log linear model to do empirical researches on the determinants of marginal fertility

decision on the Leibenstein's Theory (Qiang Ren, Qiang Fu, 2007[37]). The two recent working papers of IUSSP meeting demonstrate the determinants of fertility desire used discrete choice model – Latent Class Model（Ivy A. Kodzi et al. , 2008[38]） and fertility rate used multilevel model（Michael J. White et al. , 2008[39]）, which both are based on combination of individual and community database.

Moreover, based on the Theory of Planned Behaviour, some scholars use structural equation modeling to examine planning, maintenance self-efficacy, and action control served to mediate variable between intention and physical activity (Falko F. Sniehotta, Urte Scholz, & Ralf Schwarzer, 2005[40]). Other scholars use Multi-group structural equation modeling to examine the effect on the healthy behavior by intention, action planning, and coping planning in the HAPA model (Urte Scholz et al. , 2008[41]).

Theoretical Foundation

Two important theories of the relation of fertility desire and childbearing behavior used to decompose the multidimensional determinants in this research, which are Low Fertility Proximate Determinants Model and Theory of Planned Behaviour (TPB).

1. Low Fertility Proximate Determinants Model

According to the Mediate Variable Theory -- Low Fertility Proximate Determinants Model put forward by Professor John Bongaarts in 2001 and 2002, this research attempts to decompose the factors affecting childbearing behavior of women in China, which are socioeconomic, cultural, policy, desire, and biological factors.

Low Fertility Proximate Determinants Model （Bongaarts, 2001 & 2002）

$$\mathbf{TFR} = \boldsymbol{F_u} \times \boldsymbol{F_r} \times \boldsymbol{F_g} \times \boldsymbol{F_t} \times \boldsymbol{F_i} \times \boldsymbol{F_c} \times \mathbf{IP}$$

F_u	Unwanted Fertility	F_t	Tempo Effect	IP	Intended Parity
F_r	Replacement Effect	F_i	Infecundity		
F_g	Gender Preferences	F_c	Competition		

The low fertility proximate determinants model indicates that several factors enhancing fertility which are unwanted fertility, replacement of deceased children, sex preferences, and several factors inhibiting fertility which are postponing age at childbearing, involuntary infertility, and competition preferences（Bongaarts, 2001[10]）. China's low fertility proximate determinants model that is characteristic of native is distinguished from the low fertility proximate determinants model which mentioned above. The new depressing factors of fertility based on Bongaarts' low fertility model include the rate of misreporting, life-time fertility rate, policy total fertility rate, and rate of population floating, whereas, sex preferences will also become to inhibit factor by fetal sex selection and induced abortion（Zhigang Guo, 2008[42]）. In human fertility revolution, the change of childbearing motivation and fertility desire is an essential and original revolution, and the transition of observed fertility rate reflected desired fertility rate changed in fact. According to character of motivation and demand, wanted fertility used to decompose four components, which are replacement effect, cost effect, policy effect and desired number of children（Jianmin Li, 2008[43]）.

2. Theory of Planned Behaviour (TPB)

Theory of Planned Behaviour (TPB) is a social-psychological model to study reproductive decision-making process with macro and micro perspectives. This research attempts to decompose the multi-dimensional determinants of fertility desire and childbearing behavior among women of childbearing age used Theory of Planned Behaviour (TPB) for understanding and analyzing the complex decision-making process.

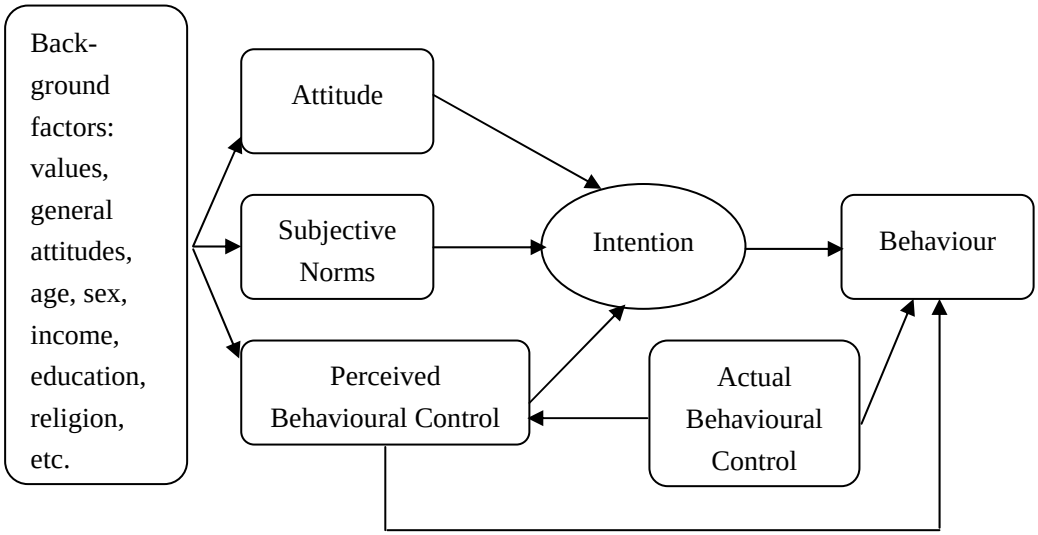
Theory of Planned Behaviour (TPB) (Ajzen, 1991[44]; 2005[45])

The TPB comprises three blocks of determinants of intentions below Each of these blocks includes several components. (Dimiter Philipov, Olivier Thévenon, et al. , 2009[46]).

(1) attitudes towards childbearing;

(2) subjective norms and influence of important others;

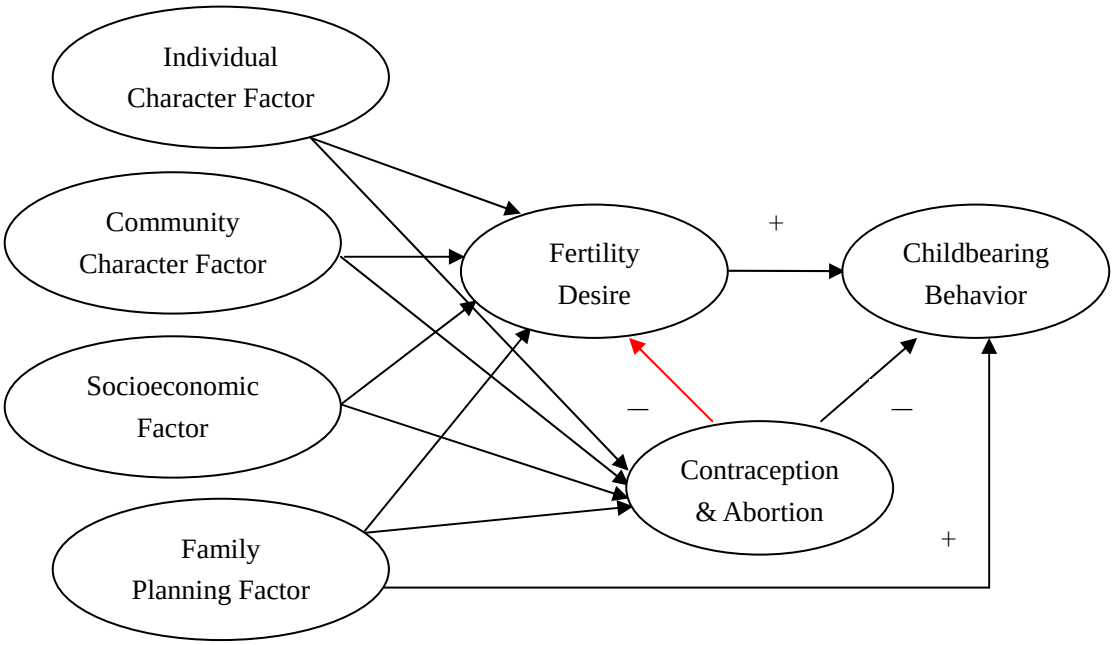
(3) perceived control over the behavior.



Graph A Model of Fertility Decision-making based on the Theory of Planned Behaviour

Analytical Framework

The objective of this research is the determinants of the divergence between fertility desire and childbearing behavior of women of childbearing age in China. This research explores to construct a SEM analytical framework based on the Low Fertility Proximate Determinants Model and Theory of Planned Behaviour for decomposing the multi-dimensional factors affecting childbearing behavior and quantifying the effects on childbearing behavior by fertility desire, family planning factor and contraception and abortion.



Graph SEM Analytical Framework of the Divergence between Fertility Desire and Childbearing Behavior of women in China

Note: The SEM analytical framework above replaced "Intention" item by "Desire" item because the questionnaire of National Survey in China has no "Intention" item.

Research Hypotheses

This research attempts to examine the multi-dimensional determinants of the divergence between fertility desire and childbearing behavior of women of childbearing age in China and test the following main hypotheses.

To examine the positive correlation between fertility desire and childbearing behavior

To examine the negative correlation between contraception, abortion and childbearing behavior

To examine the negative correlation between contraception, abortion and fertility desire

To examine positive correlation between Family Planning Factor and childbearing behavior

Data and Method

Data

The database for this research is nested combined three parts below,

1. Individual and community indicators came from National Social Conditions and Public Opinion Polls on Fertility Desire in 2007 hosted by Department of Publicity and Education at National Population and Family Planning Commission in China;
2. Socioeconomic indicators came from "Statistical Yearbook of provinces and cities in 2008" and "China County Statistical Yearbook 2008";
3. Policy Total Fertility Rate in different cities of China based on weighted estimated results by Professor Zhigang Guo (2003[47]). The research uses the reciprocal of policy fertility rate as the indicator of Fertility Planning Policy to measure intensity. It shows that the more high Policy Fertility Rate, the less intensity of Fertility Planning Policy in China.

Method

This research attempts to decompose the multi-dimensional determinants of the divergence between fertility desire and childbearing behavior of woman used Structural Equation Model (SEM) with AMOS software, which display the effects of socioeconomic, cultural, family planning policy, fertility desire, contraception and abortion.

Structural Equation Model with AMOS using Maximum Likelihood (ML) estimation was used to test the structural assumptions which reflect the causality of latent variables. Missing values were treated using mean and intercept estimation -- expected maximization (EM) method (Danhui Yi, 2008[48]p151). SEM is an effective method for measuring the causality between latent variables and multi-dimensional

factors. Based on the theory and experience, the initial hypothetical SEM should be verified and modified in order to acquiring the optimal model. Model fit was assessed by examining chi-squared / df (CMIN / DF), the comparative fit index (CFI) and the root mean square error of approximation (RMSEA) (Minglong Wu, 2009[49]p44). In recent years, RMSEA was considered as an important criterion for model fit (Steiger, 1990[50]; Browne & Cudeck, 1989[51]; Rigdon, 1996[52]).

Variables

Endogenous Latent Variables: Fertility Desire; Childbearing Behavior; Contraception & Abortion

Exogenous Latent Variables: Individual Character Factor; Community Character Factor; Socioeconomic Factor; Family Planning Factor

Observed Variables:

Individual Character Factor: age, education year, income, birth goal;

Community Character Factor: the transportation distance, the hospitals distance, the library distance;

Socioeconomic Factor: per capita farmland, total power of agricultural machinery, the per capita number of primary school students;

Family Planning Factor: the reciprocal of policy total fertility rate, whether get the singleton card;

Fertility Desire: desired number of children, the proportion of desired childbearing gender in two parities, ideal age at first childbearing, ideal interval of childbearing between first parity and second parity;

Childbearing Behavior: current survived number of children, the proportion of current survived gender in two parities;

Contraception & Abortion: whether contraception, abortion number, elicited abortion number.

Expected Findings

This research attempts to quantify the effects of main determinants affecting the divergence between fertility desire and childbearing behavior of women of childbearing age in China. The expected findings are as follows:

1. Socioeconomic Factor is an important factor of the divergence between fertility desire and childbearing behavior of woman;
2. The influence of Family Planning Factor on childbearing behavior still existed, whereas, the effect of Family Planning Policy on childbearing behavior has been weaken;
3. Fertility Desire is a principal determinant and predictor of Childbearing Behavior of women;
4. Contraception & Abortion has a strong negative effect on the Fertility Desire;
5. Decompose the multi-dimensional determinants of the divergence between fertility desire and childbearing behavior of women and quantify their effects.

Tables and Charts

Table 1 The Official Reports on Total Fertility Rate in China since 1990

year	1990 National Census	National Bureau of Statistics	1992 National Sample Survey on Fertility	1995 National 1% Sample Survey	1997 National Survey on Population and Reproductive Health	2000 National Census	2001 National Survey on Family Planning and Reproductive Health	2005 National 1% Sample Survey	2006 National Survey on Population and Family Planning
1990	2.31	2.17	2.04		2.29	2.37	2.29		
1991		2.01	1.65（1.66）		1.75	1.80	1.77		
1992		1.86*	1.52（1.47）		1.57	1.68	1.59		
1993		1.71*			1.51	1.57	1.52		
1994		1.60			1.32	1.47	1.41		
1995		1.46		1.43	1.33	1.48	1.45		
1996		1.55			1.35	1.36	1.36		
1997		1.49				1.31	1.27		
1998		1.49				1.31	1.34		
1999		1.47				1.23	1.29		
2000		1.22				1.22	1.45		
2001		1.39							
2002		1.38							
2003		1.40							
2004		1.44							
2005		1.33						1.33	1.74
2006		1.38							
2007		1.43							
2008		1.47							

Data Source: TFR of National Bureau of Statistics calculated by age-specific fertility rate in < China's Population Statistics Yearbook > (1991 ~ 2006) and <China Statistical Yearbook of Population and Employment> (2007 ~ 2009). TFR of 1992 National Sample Survey on Fertility

calculated by Zeng and Yu & Yuan according to 1992 National Sample Survey on Fertility Data (Zeng Yi, 1995[53]; Jingyuan Yu, Jianhua Yuan, 1996[54]). TFR of 1997 National Survey on Population and Reproductive Health calculated by Guo according to 1997 National Survey on Population and Reproductive Health Data（Zhigang Guo, 2000[55]）.TFR of 2000 National Census calculated by Guo used Matching Method of Mother-Child according to National Census 1 ‰ Data, TFR* estimated by Guo used Interpolation Method on the National Bureau of Statistics data from 1991 to 1994 （Zhigang Guo，2004[56]）. TFR of 2001 National Survey on Family Planning and Reproductive Health calculated by Ding according to 2001 National Survey on Family Planning and Reproductive Health Data （Junfeng Ding，2003[57]）. TFR of 2006 National Survey on Population and Family Planning obtained from <2006 National Survey on Population and Family Planning Data Collection> (edited by Weiqing Zhang et al.).

Table 2 National Fertility Desire of Women of childbearing age at Age-Specific in China

Year / Family Planning Policy / Age Group	1997	2001	2006	2002		2007	
	under the Family Planning Policy	under the Family Planning Policy	under the Family Planning Policy	under the Family Planning Policy	without the Family Planning Policy	under the Family Planning Policy	without the Family Planning Policy
16～19	1.58	1.48	1.48	1.21	1.61	1.86	1.80
20～24	1.55	1.48	1.57	1.27	1.58	1.81	1.73
25～29	1.68	1.62	1.66	1.43	1.65	1.85	1.79
30～34	1.76	1.72	1.75	1.59	1.80	1.89	1.87
35～39	1.76	1.78	1.78	1.75	1.96	1.90	1.89
40～44	1.81	1.81	1.80	1.80	2.08	1.93	1.95
45～49	1.84	1.87	1.81	1.93	2.19	1.95	1.96
Total	1.71	1.70	1.73	1.61	1.89	1.89	1.88

Data Source: Calculated by the author from National Survey on Population and Reproductive Health in 1997, National Survey on Family Planning and Reproductive Health in 2001, National Survey on Population and Family Planning in 2006, National Urban-Rural Resident Fertility Desire Survey in 2002, National Social Conditions and Public Opinion Polls on Fertility Desire in 2007.

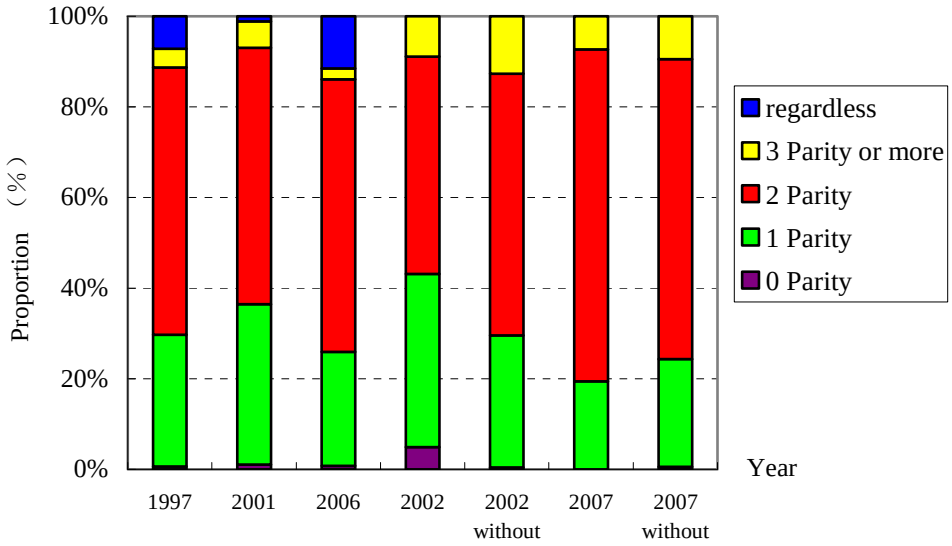


Figure 1 Proportion of desired parity among women of childbearing age in China

Source: Produced by the author. Data calculated from National Survey on Population and Reproductive Health in 1997, National Survey on Family Planning and Reproductive Health in 2001, National Urban-Rural Resident Fertility Desire Survey in 2002, National Survey on Population and Family Planning in 2006, National Social Conditions and Public Opinion Polls on Fertility Desire in 2007.

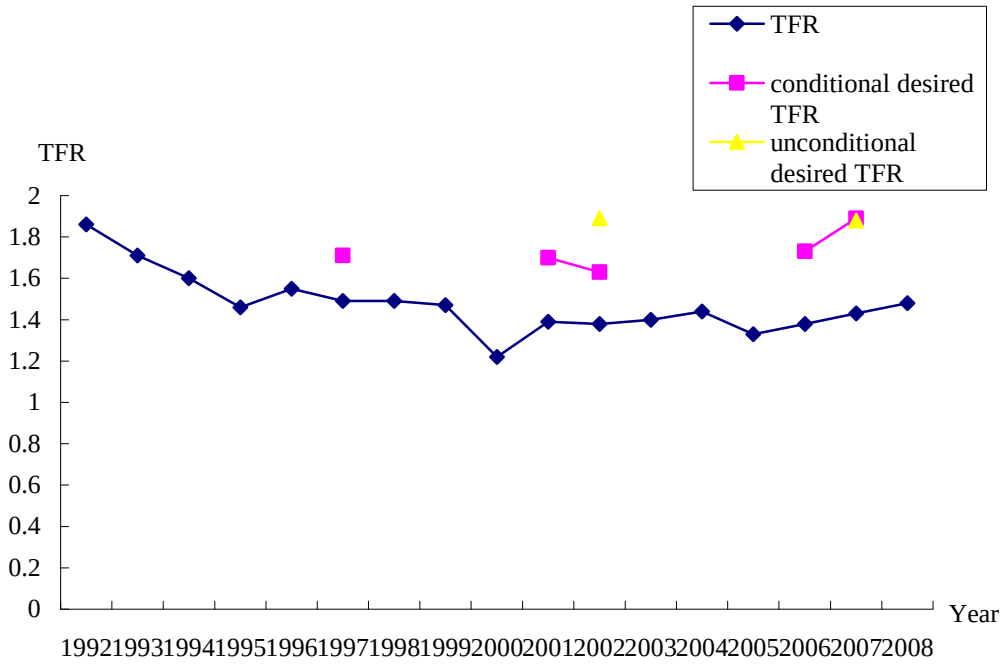


Figure 2 The Gap between Fertility Desire and Childbearing Behavior

Source: Produced by the author. TFR data came from <China Population Statistics Yearbook> (1993 ~ 2006), <China Population and Employment Statistics Yearbook> (2007 ~ 2009), 2000 National Census, and 2005 National 1% Population Sample Survey. Desired TFR data calculated from National Survey on Population and Reproductive Health in 1997, National Survey on Family Planning and Reproductive Health in 2001, National Urban-Rural Resident Fertility Desire Survey in 2002, National Survey on Population and Family Planning in 2006, and National Social Conditions and Public Opinion Polls on Fertility Desire in 2007.

References

[1] National Population and Family Planning Commission of P. R. China. Family Planning Statistical Bulletin, No. 1, 2001.

[2] Xiaochun Qiao. How Low the Chinese Fertility Can Be? *Market & Demographic Analysis*, Vol. 11, No. 6, 2005: 22-33.

[3] Guangzong Mu. An Analysis on the Phenomena of Lowest-Low Fertility. *Market & Demographic Analysis*, Vol. 11, No. 4, 2005: 29-42.

[4] United Nations-Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. 2008. World Population Prospects: The 2008 Revision, http://esa.un.org/unpp.

[5] Zeng Yi. Options for Fertility Policy Transition in China. *Population and Development Review*, Vol. 33, No. 2, 2007: 215-246.

[6] S. Philip Morgan, Guo Zhigang, & Sarah R. Hayford. China's Below-Replacement Fertility: Recent Trends and Future Prospects. *Population and Development Review*, Vol, 35, No. 3, 2009: 605-629.

[7] Fishbein M; Jaccard JJ. Theoretical and Methodological Considerations in the Prediction of Family Planning Intentions and Behavior. *Representative Research in Social Psychology*, Vol. 4, No. 1, 1973: 37-51.

[8] Lant H. Pritchett. Desired Fertility and the Impact of Population Policy, *Population and Development Review*, Vol. 20, No. 1, 1994: 1-55.

[9] Baochang Gu. Discussion on Fertility and Fertility Transition: Quantity, Time and Gender. *Population Research*, Vol.78, No. 6, 1992: 1-7.

[10] John Bongaarts. Fertility and Reproductive Preference in Post-transitional Societies. *Population and Development Review*, Vol. 27, Supplement: Global Fertility Transition. 2001, 260-316.

[11] Larry L. Bumpass. The risk of an unwanted birth: the hanging context of contraceptive sterilization in the U.S.. *Population Studies*, Vol. 41, No. 3, 1987: 347-363.

[12] R. R .Rindfuss, S. P. Morgan, & G. Swicegood. First births in America: Changes in the timing of parenthood. Berkeley: University of California Press. 1988: 291.

[13] E. Thomson. Couple Childbearing Desires, Intentions and Births. *Demography*, Vol. 34, No. 3, 1997 a: 343-354.

[14] Charles F. Westoff, and N. B. Ryder. The Predictive Validity of Reproductive Intentions. *Demography*, Vol. 14, No. 4, 1977: 431–453.

[15] Paschal Sheeran. Intention–behavior relations: A conceptual and empirical review. In Miles Hewstone & Wolfgang Stroebe (Eds.), *European review of social psychology*, Vol. 12, No. 1, Chichester, England: Wiley. 2002: 1–36.

[16] Urte Scholz et al. . Beyond behavioral intentions: Planning mediates between intentions and physical activity. *British Journal of Health Psychology,* Vol. 13, No. 3, 2008: 479–494.

[10] John Bongaarts. Fertility and Reproductive Preference in Post-transitional Societies. *Population and Development Review*, Vol. 27, Supplement: Global Fertility Transition. 2001, 260-316.

[17] David Coleman. New patterns and trends in European fertility: International and sub-national comparisons, in D. Coleman (ed.), *Europe's Population in the 1990s*. Oxford: Oxford University Press.

[18] Charles F. Westoff. Reproductive preferences: A comparative view, *Demographic and Health Surveys Comparative Studies*, No. 3 Columbia, Maryland: Macro Systems & Institute for Resource Development. 1991: 27.

[19] Charles F. Westoff, Charles Hammerslough & Luis Paul. The potential impact improvements in contraception on fertility and abortion in Western countries. *European Journal of Population*, Vol. 3, No. 1, 1987: 7-32.

[20] Knodel, John Vipan Prachuabmoh Ruffolo, Pakamas Ratanalangkarn, and Kua Wongboonsin. Reproductive Preferences and Fertility Trends in Post-transition Thailand. *Studies and Family Planning*, Vol. 27, No. 6, 1996: 307-318.

[21] Juhua Yang. The Intention and Behavior of Reproduction in Developed Countries: a Review. *Academia Bimestris*. No. 1, 2008: 27-37.

[22] Dudley Poston and Baochang Gu: "Socioeconomic Development, Family Planning and Fertility in China". *Demography*, Volume 24, No. 4, November 1987: 531 -551.

[23] Dudley Poston and Zhongke Jia. Socioeconomic Structure and Fertility in China: A County-level Investigation. International Population Conference, New Deli, September 20-27, 1989, Vol. 1, Liege Belgium IUSSP 1989: 69-81.

[24] Fengyu Zhang. The Multilevel Analysis on the Determinants of Parity-specific Birth Probabilities. *Chinese Journal of Population Science*, Vol. 64, No. 1, 1998: 17-31.

[25] Zhenzhen Zheng. An Analysis on the Interval of First Marriage and First Birth of Women in China Since 1980's. *Population & Economics*, Vol. 113, No. 2, 1999:

13-17.

[26] Yuan Ren. LISREL Model for Community Development and Fertility Behavior. *Chinese Journal of Population Science*, Vol. 70, No. 1, 1999: 13-19.

[27] Robert Schoen, Nan Marie Astone, Young J. Kim, Constance A. Nathanson and Jason M. Fields. Do Fertility Intentions Affect Fertility Behavior? *Journal of Marriage and the Family*, Vol. 61, No. 3, 1999: 790-799.

[28] Tao Yang, Marjorie McElroy. The Impact of Family Planning Policy on the Fertility Rate in China. *Chinese Journal of Population Science*, Vol. 78, No. 3, 2000: 18-22.

[29] Wei Chen, Mei Shi. The Re-examined Research on Determinants of Fertility of Women in China: A Empirical Analysis Using Easterlin Model. *Chinese Journal of Population Science*, No. 2, 2002: 49-53.

[30] Wei Chen. The Development – Family Planning – Fertility Relationship in China: A Reexamination Using Provincial Level Data. *Popualtion Research*, Vol. 29, No.1, 2005: 2-10.

[31] Jiehua Lu, Chonghui Fu, Jinhui Zhang, Xuchun Zeng. Fertility Behavior of Migrant Women in Shenzhen City: An Analysis Using Structural Equation Models. *Popualtion Research*, Vol. 29, No. 2, 2005: 25-33.

[32] Zhigang Guo, Xiwei Wu. Application of Poisson Regression on Fertility Study. *Chinese Journal of Population Science*, No. 4, 2006: 2-15.

[33] Zhigang Guo, Jianjian Li. Second Birth Intervals in Rural China: An HLM Analysis. *Popualtion Research*, Vol. 30, No. 4, 2006: 2-11.

[34] Maria Rita Testa, Leonardo Grilli. The Influence of Childbearing Regional Contexts on Ideal Family Size in Europe. *Population*, Vol. 61, No. 1 / 2 (Jan-Apr.), 2006: 109-137.

[35] Zhigang Guo. Multilevel Analysis of Sex Ratio at Birth in China 2000 Population Census. *Popualtion Research*, Vol. 31, No. 3, 2007: 20-31.

[36] Zi Chen, Changrong Deng. Study on Desired Birth of Chinese Women. *Chinese Journal of Population Science*, No. 6, 2007: 75-81.

[37] Qiang Ren, Qiang Fu. Marginal Fertility Decision in Economic Development: Testing the Leibenstein's Theory. *Chinese Journal of Population Science*, No. 1, 2007: 60-70.

[38] Ivy A. Kodzi, John B. Casterline, & Peter Aglobitse . 2008 The Time Dynamics of Individual Fertility Preferences among Rural Ghanaian Woman. Working Paper of

IUSSP International Seminar on Human Fertility in Africa. Sep 2008, Cape Coast, Ghana.

[39] Michael J. White, Kofi Awusabo Asare & Holly Reed. 2008 Community Factors in Recent Ghanaian Fertility. Working Paper of IUSSP International Seminar on Human Fertility in Africa. Sep 2008, Cape Coast, Ghana.

[40] Falko F. Sniehotta, Urte Scholz, & Ralf Schwarzer. Bridging the Intention-Behaviour Gap: Planning, Self-efficacy, and Action control in the Adoption and Maintenance of Physical Exercise. *Psychology and Health*, Vol. 20, No. 2, 2005: 143-160.

[41] Urte Scholz, B. Schüz, J. P. Ziegelmann, S. Lippke, & R. Schwarzer. Beyond behavioral intentions: Planning mediates between intentions and physical activity. *British Journal of Health Psychology*, Vol. 13, No. 3, 2008: 479–494.

[10] John Bongaarts. Fertility and Reproductive Preference in Post-transitional Societies. *Population and Development Review*, Vol. 27, Supplement: Global Fertility Transition. 2001, 260-316.

[42] Zhigang Guo. China's Low Fertility and Its Determinants. *Popualtion Research*, Vol. 32, No. 4, 2008: 1-12.

[43] Jianmin Li. Fertility Revolution in China. *Popualtion Research*, Vol. 33, No. 1, 2009: 1-9.

[44] I. Ajzen. The theory of planned behavior. Organizational Behavior and Human Decision Processes 50, 1991: 179-211.

[45] I. Ajzen. Attitudes, personality, and behavior (2nd ed.). Maidenhead, Berkshire, England: Open University Press. 2005.

[46] Dimiter Philipov, Olivier Thévenon, Jane Klobas, Laura Bernardi, Aart C. Liefbroer. Reproductive Decision-Making in a Macro-Micro Perspective (REPRO) State-of-the-Art Review. *European Demographic Research Papers*, No. 1, 2009.

[47] Zhigang Guo, Erli Zhang, Baochang Gu, Feng Wang. Diversity of China's Fertility Policy by Policy Fertility. *Population Research*, Vol. 27, No. 5, 2003: 1-10.

[48] Danhui Yi. Structural Equation Modeling: Methodology and Application. Renmin (People's) University of China Press, Beijing, 2008.

[49] Minglong Wu. Structural Equation Modeling—AMOS Operation and Application. Chongqing University Press in China, 2009.

[50] Steiger, J. H. Structural Model Evaluation and Modification: An Interval Estimation Approach. *Multivariate Behavioral Research*, Vol. 25, No.2, 1990:

173-180.

[51] Browne, M. W. & R. Cudeck. Single Sample Cross-Validation Indices for Covariance Structures. *Multivariate Behavioral Research*, Vol. 24, No.4, 1989: 445-455.

[52] Rigdon, Edward E. CFI versus RMSEA: A Comparison of Two Fit Indices for Structural Equation Modeling. *Structural Equation Modeling: A Multidisciplinary Journal*, Vol. 3, No. 4, 1996: 369-379.

[53] Zeng Yi. Is Fertility in China in 1991-1992 Far Below the Replacement Level? *Population Research*, Vol. 50, No. 3, 1995: 27-34.

[54] Jingyuan Yu & Jianhua Yuan. Analysis on the Childbearing of China's women in recent years. National 1 % Sampling Servey on Fertility in 1992. Beijing: China Population Press. 1996.

[55] Zhigang Guo. Analysis of China's Fertility Levels in 1990s-Comparison of Different Measurement Indexes. *Chinese Journal of Population Science,* Vol. 79, No. 4, 2000: 11-18.

[56] Zhigang Guo. Fertility in China in the 1990s. *Population Research*, Vol. 28, No.2, 2004: 10-19.

[57] Junfeng Ding. Analysis about the Impact of Changes in Fertility Pattern on Fertility Level for China between 1991 ～ 2000. *Population Research*, Vol. 27, No.2, 2003: 55-60.