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Fertility Trends in China's More Developed Urban Districts: The Case of Four Cities

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ABSTRACT

This research examines fertility trends in more developed urban districts in China, and provides empirical evidence which enhances our theoretical understanding of fertility. The research uses the study areas of Shanghai, Beijing, Changchun and Shenyang, with the assumption that these cities might provide insights into future fertility trends in China. Data were collected using survey questionnaires and face-to-face and telephone interviews. Participants and their parents reported their demographic characteristics and reproductive desires, and the reasons behind their decisions. Selected participants and family planning officials and workers were interviewed to check the reliability of the information provided on the surveys and to further examine explanations for fertility decline. The research found major differences in demographic characteristics and behaviours between generations and among different demographic groups and the four cities. Very low fertility and reproductive desire were found in these places, together with a high proportion of childless families and a high male/female sex ratio. Career pressure and financial constraints were found to be more important than the one-child policy in explaining these trends. These findings generally agree with local reports and publications and common explanations of fertility change in developed countries. Copyright © 2005 John Wiley & Sons, Ltd.

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INTRODUCTION

In a recent article in the journal *Progress in Human Geography*, Boyle (2003) pointed out that the invisibility of geographers in fertility research is particularly disappointing because of the importance of a geographical interpretation of fertility trends and issues, since place is important to fertility decision-making. A geographical perspective is one of the keys to understanding fertility trends, and any explanation of fertility change requires an understanding of local cultures and social leanings (Boyle, 2003). Geographical perspectives are also important for enhancing demographic theories for the explanation of fertility change. A special issue of *International Journal of Population Geography* was recently devoted to stimulating debate about possible new and more theoretically grounded population geographies (Graham and Boyle, 2001), and a theoretical debate has been ongoing over whether current demographic transition theories may be developed into a common theory for explanations of the varied fertility trends in different parts of the developed world (Caldwell and Schindlmayr, 2003, 2004; Billari *et al*., 2004). According to Caldwell (2004), demographic theorists lost their nerve as the globalisation of declines in mortality and fertility proceeded much more rapidly than they had anticipated.

As many fertility theories are based on experience in the West, their applicability to other places such as China has been questioned. China

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has experienced tremendous fertility decline in recent decades, and this is regarded as China's most remarkable and far-reaching demographic change (Pannell, 2003). As a result, traditionally large families have in the main disappeared in China's cities. Families with more than one child are rare, while childless families are increasing. The natural population growth rate has been negative in some large cities, causing concerns about population ageing instead of overpopulation. Success in population control in China, especially in its urban areas, is widely recognised. However, applying population theories to make sense of the rapid fertility decline and very low fertility in large cities has not been easy. Today, China appears to be in the last stage of demographic transition, with fertility as low as that in developed countries, while its per capita gross national product is still far behind. Such low fertility has naturally been believed to be the result of family planning policies (Peng, 1991; Milwertz, 1997; Hussain, 2002; Zhang, 2005).

China's fertility transition accelerated greatly after 1970 under the official 'late, spacing, and few' family planning programme (Lee and Wang, 1999). A notorious one-child policy was adopted in 1979, in response to a virtual population crisis (Greenhalgh, 2003). The one-child policy refers to a set of rules and regulations that were resolutely enforced by the Chinese government to control fertility. It requires late marriage and childbirth, as well as one child per family under normal circumstances (for details of the development of the policy, see Banister, 1987; Lee and Wang, 1999; Greenhalgh, 2003). On the other hand, conventional explanations of fertility decline in the West are also viewed as important in explaining the Chinese experience. These explanations include socio-economic development, urbanisation, and education as major causes of fertility decline (Guo, 1996; Milwertz, 1997; Hussain, 2002; Harbison and Robinson, 2002). Lee and Wang (1999) believe that the collective culture, and other distinctive features of the Chinese demographic and social system, led to a different demographic transition in China from the one that took place in the West.

OBJECTIVES AND METHODS

This paper examines the fertility trends in China's more developed urban districts, with a focus on intergenerational changes in the determinants of fertility and reproductive desire. Furthermore, this research investigates differences in demographic characteristics and behaviours between generations, and among three demographic groups and four large cities. It intends to contribute to the development of fertility theories for explaining fertility trends in unique places.

The study area includes four large cities: Shanghai, Beijing, Changchun and Shenyang (Fig. 1). It has been reported, and is generally believed, that China's large cities have led the way in the fertility decline (Peng, 1991; Guo, 1996), along with higher levels of socio-economic development, urbanisation and education. Shanghai and Beijing were chosen because they are China's largest cities and leaders in the fertility decline. Shanghai is a pioneer in birth control, and its fertility rates started to decline no later than 1955 (Guo, 1996). Beijing, as the national capital, is the showcase of China's population control and economic development. Changchun and Shenyang are the capitals of Jilin and Liaoning provinces, whose fertility was among the lowest of China's provinces (Pannell, 2003). According to China's 2000 Census (National Bureau of Statistics of China, 2003), Jilin's fertility is the lowest among all China's provinces, except for Beijing and Shanghai. Caldwell and Schindlmayr (2003) defined 'very low fertility' as total fertility below 1.5. Total fertility is 0.64, 0.67, 0.79 and 0.86, respectively, for the urban districts of Shanghai, Beijing, Changchun and Shenyang (National Bureau of Statistics of China, 2003). These cities were also chosen because of the availability of field assistance with data collection, participant accessibility, and the size and location of the cities. There are considerable differences among the four cities in terms of economic, cultural and social developments.

Similar to other large cities in China, these four cities include three divisions. The inner part is called '*shi qu*' (city proper or city districts), followed by '*shixia qu*' (district under city jurisdiction) and '*shixia xian*' (county under city jurisdiction). Level of urbanization decreases from *shi qu* to *shixia xian*. Figure 2 shows the three divisions in Beijing as an example. This research includes only the *shi qu* and *shixia qu*, and regards both of them as urban districts. The number of urban districts ranges from 6 to 10 among the four cities. The urban districts represent from

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Figure 1. Locations of the urban districts of the four cities in China.

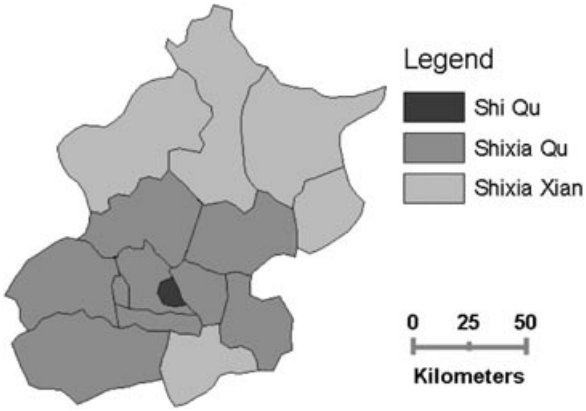

Figure 2. Beijing: the urban districts (*shi qu* and *shixia qu*) and *shixia xian*.

45% to 87% of the total population of Changchun, Shenyang, Beijing and Shanghai, which ranges from 7.1 to 16.4 million. In each city those urban districts with above average per capita gross domestic product (GDP) in 2000 are treated as the 'more developed' urban districts. These are places where people are better educated, wealthier, and employed mainly in the service sector. Fertility and reproductive desire is very low in these places. These particular places were selected for the study under the assumption that they could tell us something about future fertility trends when China becomes more urbanised and the general population becomes more educated and wealthier.

With the help of local collaborators, I systematically selected three representative neighbourhoods or subdivisions called *xiao qu* in the more developed urban districts in each city. To be representative, the selected communities were above average in terms of education, income and fertility trends. The size of these communities ranged from 226 to 443 households. The data were collected using survey questionnaires, and face-to-face and telephone interviews, conducted between June 2001 and August 2004.

Participants were selected from educated urban residents aged 18 to 40, whose parents were also able to provide information. Also, they were from one of three demographic groups:

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unmarried and no children; married but no children; married with children. This grouping method was used under the assumption that demographic trends might be different among the three groups, and comparison among them might provide indications for future demographic trends. Survey questions were designed corresponding to the three groups, one of which the participants identified themselves with. To enhance data reliability and return rate, questionnaires were hand-delivered to a total of 1600 randomly selected households. Each household had at least one qualified person who agreed to participate. The survey was anonymous and only one participant per household was allowed.

The survey had two questionnaires enclosed in separate envelopes: one for the participants and the other for their parents to complete. In case the parents had difficulty filling out the form (e.g. illiterate), the participants would interview their parents and fill out the form for them according to the interview results. Only those who agreed to collect their parents' information qualified for the survey. While all those who were unmarried with no children were living with their parents, the majority of the other participants were not. However, many of their parents lived in the same apartment building, subdivision, district or city. These parents saw or communicated with the participants at least weekly. Two stamped envelopes were provided to participants who wanted to mail the parent questionnaire to their parents. Participants returned both personal and parental questionnaires together. Of the returned surveys, 938 were complete and used for analyses. These included: 366 unmarried and no children; 221 married but no children; 349 married with children. More than 50% of the participants interviewed their parents and filled out the form for them. This percentage was higher than expected and raised the possibility that parents' answers to the questions about son or daughter preferences might have been affected (I return to this issue later). Parent questionnaires filled out by parents were compared with those filled out by participants and the results were very similar. Hence, they were all used together in the analyses.

Also, it should be noted that for participants who were not married or without children, their replies to related questions were based on what they planned to do. This needs to be considered as a factor when comparing participant replies with their parents' replies. Seven to nine households were randomly selected in each community for personal interviews with participants and their parents. Three to six family planning officials and workers were also interviewed in each city. All the interviewees had easy access to telephones. The purposes of the interviews were to check the reliability of the information provided on the surveys and to further examine explanations of fertility decline. Interview results confirmed the reliability of the survey results and provided more in-depth explanations for the identified demographic changes.

RESULTS AND DISCUSSION

Inter-Generation Differences

The participants, their parents, and their grandparents are distinguished, and descriptive statistics provided, in Table 1. The survey did not target the grandparent generation. However, the collected data included the number of siblings the parents had, which was used to represent the number of children the grandparents had. This is the reason that the item for the number of children in Table 1 includes the grandparent generation. Compared with their parents, the participants married (or would marry), and had (or would have) children much later. The participants' marriage age was almost 26.8 years on average for those who were married or were planning to marry. For those who had, or were planning to have, children, the average age of the first childbirth was reported to be 29.9 years. These are considerably older ages than for the parents. Because some participants planned not to marry or have children, there were fewer cases for the ages of marriage (C) and first childbirth (D) (Table 1). Of all participants, 54 (5.8%) reported that they planned not to marry, while 108 (11.5%) planned not to have children.

Analysis of variance (ANOVA) tests were used to compare demographic variables by generations to see whether their means were statistically different (at 0.05). The ANOVA results reject the null hypothesis and indicate that the means of each demographic variable in the two generations are different, except for the daughter preference variable (P). Items H, L, N and Q compare means, first within a generation and then

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Table 1. Demographic comparison between participants and their parents.

Variable	Generation	*n*	Mean	Min.	Max.
A Ages	Participant	936	28.7	19	40
	Parent	1876	56.3	42	74
B Education	Participant	936	15.2	9	19
	Parent	1876	10.9	0	20
C WedAge	Participant	882	26.4	21	31
	Parent	1876	25.2	16	33
D KidAge	Participant	728	29.9	25	36
	Parent	1876	26.6	18	40
E Interval	Participant	938	3.48	–1	12
	Parent	1876	1.34	–1	7
F TotalBoy	Participant	938	0.38	0	2
	Parent	1876	1	0	3
G TotalGirl	Participant	938	0.39	0	2
	Parent	1876	0.99	0	3
H F–G	Participant	938	0.01[b]		
	Parent	1876	0.01[b]		
I TotalKid	Participant	938	0.77	0	2
	Parent	938	1.99	1	6
	Grandparent	1876	4.24	1	10
J BoyDesire	Participant	938	0.57	0	2
	Parent	1541	1.86	1	4
K GirlDesire	Participant	938	0.57	0	2
	Parent	1541	1.54	1	2
L J–K	Participant	938	0[b]		
	Parent	1876	0.32[a]		
M TotalDesire	Participant	938	1.22	0	4
	Parent	1541	3.4	2	6
N M–I	Participant	938	0.45[a]		
	Parent	1541	1.41[a]		
O SonPref %	Participant	938	0.15	0	1
	Parent	1541	0.39	0	1
P DaughterPref %	Participant	938	0.16	2	
	Parent	1541	0.1	0	1
Q Q–P	Participant	938	0.01[b]		
	Parent	1876	0.29[a]		
R NoPref %	Participant	938	0.69	0	1
	Parent	1541	0.51	0	1

Variables: A, age in years at time of survey; B, years of schooling received; C, age at which wedding took place or was planned; D, age at which first child was born or was planned; E, interval of years between marriage and the first childbirth; F, number of sons born or desired; G, number of daughters born or desired; H, difference between F and G; I, total number of children born or planned; J, number of sons that would have been desired if the one–child policy was not in place; K, number of daughters that would have been desired if the one–child policy was not in place; L, difference between J and K; M, total number of children that would have been desired if the one–child policy was not in place; N, difference between M and I; O, percentage of all responses that gave preference to sons; P, percentage of all responses that gave preference to daughters; Q, difference between O and P; R, percentage of all responses that gave no gender preference.
Mean: All means are significantly different between generations, except that item P is not.
[a] Difference between the two items being compared within generation is significant (at 0.05 level).
[b] Not significant.

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between generations. Item H indicates no difference within either generation between boys and girls born (I return to this issue later).

Participants expressed no gender preference in the number of desired boys and girls, but their parents had desired to have more boys (Item L). While the participants' desire was for fewer children than their parents, Item N indicates that both generations would prefer more children than they actually had (or planned to have). This means that the family planning policies were effective in controlling population. The participants had significantly fewer children, 0.77 children or about 39% of their parents' 1.99 children. On the other hand, it may be suggested that family planning was more effective for the parents, as they had 1.99 children despite an average desire to have 3.4. It is interesting to see that the participants only desired an average of 1.22 children, which is just 22% above the one-child limit set by the government. With 1.22 children per family, the population would still experience population decline, since it is well below the replacement rate of 2.1 children (Hussain, 2002). Besides, studies show consistently that people tend to have fewer children than they desire. That may especially be true in a study area where abortion is accepted, or even encouraged, and inexpensive. On the other hand, what people plan or desire to do may not be what they will do. Many people may get married or have a child at the age they plan. However, people who desire to have a girl will not have a better chance to get one, unless they take measures, which is uncommon. Over half of the participants (69%) and their parents (51%) indicated no gender preference. The rest of the participants were split half-and-half between son and daughter preferences, while their parents had strong son preferences.

Why Aren't They Having Babies?

It is interesting to investigate why the participants and their parents made the demographic decisions they did. The Chinese government and many publications in China generally credit the family planning policies for the late marriage, late childbirth, and low birth rates (Peng, 1991; Milwertz, 1997; Hussain, 2002; Zhang, 2005). The research results indicate a more complicated situation in this study area. Often, people decided to delay marriage or childbirth because one or both of the couple had high career goals. They were pressured by time due to educational goals, military enlistment, or simply the pressures of work. These reasons are grouped under 'Career' in Tables 2 and 3. Money was also a factor because of the financial demands of marriage, childbearing and child-raising, which include extra housing and educational costs.

Tables 2 and 3 summarise the reasons for the participants' personal and parental decisions. The varied case numbers for the parents indicate that some parents were not able to provide reasons for certain decisions. In Tables 2–3, 'family planning' refers to pressure from the family planning programmes, rather than access to contraception. Family planning does not mean the same for the time periods before and after 1979. It refers to the one-child policy since 1979, and the less strict family-planning policy before 1979. Family

Table 2. Percentage share of all reasons for late marriage, childbirth, and number of children.

	Participants	Parents
For late marriage (*n*)	(936)	(1297)
Family planning	15.9	43
Career	35.2	23
Money	23.9	16
Other (housing shortage, waiting for Mr/Mrs Right, disagreeing with parents, etc.)	25	18.8
For late birth (*n*)	(936)	(1221)
Family planning	16	46
Money	29	21
Career	22	18
Social stress (corruption, etc.)	17	2
Other (no luck, etc.)	15.2	12.9
For one child (*n*)	(936)	(1338)
Family planning	41.5	61
Money	30.2	24.4
Career	18.9	9.76
Other (no help, miscarriages)	9.43	4.88
For more than one child (*n*)	(936)	(1338)
Companionship	81.4	56
Family tradition	5	28
Other (match, love, etc.)	13.6	16

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Table 3. Percentage share of all reasons for reproductive desire and gender preference.

	Participants	Parents
For desiring to have more children (*n*)	(936)	(1271)
Companionship	60.8	16.9
Value in a large family	26.3	33.9
Labour	2	25.4
Family name	3	16.9
Other (match, etc.)	7.89	6.78
For not desiring to have more children (*n*)	(936)	(1271)
Money	47.4	82.5
Career	31.5	7.04
Social stress (corruption, etc.)	15.3	2
Other (no interest, unhappy marriage, etc.)	5.83	8.45
For preference for sons (*n*)	(936)	(1154)
Labour, supporting parents	6	28.8
Family name	12.6	25.2
Other social	25.1	33.6
Easy to raise	44.3	8.46
Other (successful, famous)	12.1	4.23
For preference for daughters (*n*)	(936)	(1154)
Caring	19.4	18
Change	5	25.2
Cute	68.8	21.6
Easy to raise	4	32.4
Other (dislike of boys)	2.8	2.72

planning was reported as the major reason for the participants' parents to have late marriages, but it was not the only reason. Career and financial pressures were also important. As for the participants themselves, career and money were more important reasons than the one-child policy. Other reasons included waiting for 'Mr. or Mrs. Right' (mainly for the participants), or putting the wedding off or the marriage on hold due to disagreements with parents about who they should marry. Some of the parents, who were less able to refuse to participate in arranged marriages, chose to delay these unions. Shortage of housing was also reported as a reason by the parents. There were several cases where three generations lived in one small room. Some lived in their offices. For the participants, housing was much less problematic. This was possibly because the study areas are more developed places, with a higher proportion of people with decent incomes and housing.

For late childbirth among the parents, pressure from family planning programmes was again the number one reason, while money and career ranked second and third. For the participants, the one-child policy ranked behind money, career and social stress. It seems that career pressure was more important for late marriage, as lack of money was for first childbirth. Some said they were not able to afford a child because they did not even have enough money to take care of themselves. Other reasons included miscarriages, abortions, and unsuccessful early pregnancies.

Pressure from family planning programmes was the most important reason for both the participants and their parents to have only one child. The participants' parents regarded family planning policies as the major factor in determining the number of children they had. Money and career factors were also important, but more so for the participants. People had more than one child mainly for better companionship for themselves and their children. They worried that the only child would have no siblings to grow up with and would lack family support when the parents died. This was particularly true for the participants. Tradition was an important reason for the parents to have more than one child, but not for the participants. Other people had more than one child because they wanted to have a 'match' (both a son and a daughter) or because they simply loved children so much that they ignored the one-child policy. In some cases the government allowed them to have second births and the reasons for this varied. For example, a second birth was allowed if the first child became handicapped, or if the parents themselves were single children and their first child reached a minimum age (usually five).

Both the participants and their parents desired more children than they had or were allowed to have (Table 1). However, they did not feel that way for the same reasons (Table 3). The participants desired more children mainly for companionship for their single child and themselves. Chinese traditional beliefs value large families, as couples with many children used to be considered lucky and successful. This tradition affected reproductive desire, but less so for the

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participants than their parents. Valuing large families was the most important reason that parents cited for desiring more children, followed by labour supply and carrying on the family name. Other reasons included the desire to have a change or match of gender among their children. Over 47% of the participants and over 82% of the parents regarded money as the most important reason for not desiring more children. Career and social stress were important reasons mainly for the participants.

A high percentage of people reported no gender preference (Table 1). The interviews revealed that many people indeed felt equally happy to have either a son or a daughter. Others said they were, or would be, happier to have a son, but still identified themselves as having no preference, because they were, or would have been, nearly as happy to have a daughter. The media, and particularly the family planning propaganda, may have influenced people's answers, as the problems associated with son preference have been publicised.

It is also true that people who had a son tended to say they preferred a son, as preferences prior to birth often disappear once the children are born. From the interviews three kinds of parents could be identified. Some parents never had a preference, and they rightfully identified themselves so. Some would have preferred a son before childbirth, and even used different methods to get a boy, but following the birth of a girl their preferences disappeared. On the other hand, some parents continued to have a son preference even after the birth of a daughter. Some female participants even reported that their parents had always preferred a son and were never happy about having had a daughter. Of course, in other cases it is possible that a female's parents might say they preferred a daughter in order to please their daughter, who may have conducted the interview or with whom they were living.

As for son preference, the parents regarded labour, family name, and other social factors as the most important reasons. In addition to labour demand in rural areas, the physical demands of daily life were also considerable in many urban households two decades ago; carrying coal for heating and cooking was one example of this. Passing on the family name was also a common reason for desiring sons. Other social factors included pressure from parents, grandparents, and peers – traditionally Confucianism discriminates against parents who do not have a son.

The participants were much less concerned about issues related to household labour or family name. On the whole, they thought sons were easier to raise: 'You do not need to worry about them being hurt. It is also easier for men to find jobs and be successful in a career than women.' Men continue to be more socially and economically successful in the male dominant society. Others said daughters were easier to raise. As people had different life experience, it was difficult to define exactly what was meant by 'easy to raise'. Sometimes it was just a personal judgment. Some said that girls demanded better clothing, and thus cost more to raise, but were more vulnerable to assaults, while others believed that girls were less naughty and more obedient. This reason was more important for the participants. Daughters were also regarded as more caring for siblings and parents. Some were afraid of having a naughty, disobedient and uncaring son: 'A son is useless [for caring for the old folks]. He tends to obey his wife and neglect his parents.' A Chinese saying describes such boys as 'forgetting his mother after taking a wife'.

Differences among Three Demographic Groups and Four Cities

The following analyses focus on the participants. ANOVA tests were used to compare demographic variables by three demographic groups and four cities to test for statistical differences using the LSD (least significant difference) test. These statistics test the null hypothesis (at a specified level of significance, 0.05) that the means of each demographic variable in the three demographic groups or the four cities are not different. The results indicate that the means of each demographic variable in the three demographic groups are significantly different, except for the son preference variable (Table 4). Furthermore, the means of most variables in the three groups were statistically different from each other.

As presented in Table 4, the three demographic groups are significantly different in age, with Group 1, the unmarried with no children, as the youngest with a 25.4 year average. Excluding

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Table 4. ANOVA for demographic characteristics and behaviours for three demographic groups.

			1 Unmarried and no children	2 Married but no children	3 Married with children	F-ratio	P > F
A	Ages	*n*	366	221	349	542	0
		Mean	25.4	30	31.3		
		Sig. different	2, 3	1, 3	1, 2		
B	Education	*n*	366	221	349	154	0
		Mean	16.7	17.1	12.4		
		Sig. different	2, 3	1, 3	1, 2		
C	WedAge	*n*	310	221	351	72.9	0
		Mean	28	26.4	25.8		
		Sig. different	2, 3	1, 3	1, 2		
D	KidAge	*n*	254	110	351	137	0
		Mean	30.2	31.7	27.8		
		Sig. different	3	3	1, 2		
E	Interval	Mean	2.7	5.4	2.1	180	0
		Sig. different	2, 3	1, 3	1, 2		
		n (same for the rest)	366	221	351		
F	TotalBoy	Mean	0.28	0.23	0.57	51.4	0
		Sig. different	3	3	1, 2		
G	TotalGirl	Mean	0.39	0.2	0.5	24.8	0
		Sig. different	2, 3	1, 3	1, 2		
H	F–G	Sig. different	Yes	No	Yes	30.1	0
I	TotalKid	Mean	0.66	0.43	1.1	125	0
		Sig. different	2, 3	1, 3	1, 2		
J	BoyDesire	Mean	0.42	0.29	0.77	67.7	0
		Sig. different	2, 3	1, 3	1, 2		
K	GirlDesire	Mean	0.54	0.29	0.65	34.9	0
		Sig. different	Yes	No	Yes	41.3	0
L	J–K	Sig. different	2, 3	1, 3	1, 2		
M	TotalDesire	Mean	1.1	0.58	1.42	77	0
		Sig. different	2, 3	1, 3	1, 2		
N	M–I	Sig. different	Yes	Yes	No	98.1	0
O	SonPref%	Mean	0.14	0.16	0.14	0.26	0.77
P	DaughterPref%	Mean	0.22	0.21	0.11	7.32	0
		Sig. different	3	3	1, 2		
Q	O–P	Sig. different	Yes	No	No	4.3	0
R	NoPref %	Mean	0.45	0.34	0.75	64.2	0
		Sig. different	2, 3	1, 3	1, 2		

participants who planned never to marry, Group 1 planned to marry significantly older than the other two groups. Among the 366 unmarried, 56 participants (15.3%) planned not to marry and 112 (30.6%) planned to have no children. Among the married with no children, a surprisingly high 50%, or 111 out of the 221 participants, did not plan to have children. Excluding those who planned not to have children in Groups 1 and 2, participants in Groups 1 and 2 planned to have their first childbirth at a significantly older age and after a longer period since marriage than those in Group 3 (Table 4). Those in Groups 1 and 2 also desired significantly fewer boys than those in Group 3. The three groups are all different from each other in terms of the number of girls the participants had or desired to have. Group 2 desired the smallest number of girls. While Group 1 desired more girls than boys and Group 2 gave no significant gender preference, Group 3

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actually had more boys than girls (there was a male–female ratio of 114 to 100).

A small minority, from 14% to 16% of all participants, claimed to prefer sons. Group 1 preferred daughters. As people in Group 1 were the ones who were going to marry and have children later, this might suggest that son preference is declining while daughter preference is increasing in urban China. During field interviews, I met many who preferred to have girls and were happy with one child. I collected information on 11 families who were allowed to have a second child since their first and only child was a girl; all of them declined to do so. Two couples said that they would want to have a second child only if they were sure that it would be another girl. I was told on three occasions that someone aborted the foetus after they discovered it was a boy; further research is required on this issue.

The ANOVA results that compare the four cities show that participants were similar in many respects (Table 5). Their age, education, and the number of girls and boys born or desired were not significantly different. The majority of participants in all cities expressed no gender preference. However, significant differences were found between the cities in some respects, such as ages at which participants wedded or planned to wed (C), had, or planned to have, a first child (D). In both cases, participants in Changchun and Shenyang gave a younger age than participants in Beijing and Shanghai. Participants in Changchun had, or planned to have, more children, desired to have more boys and more girls, and expressed stronger son preference than participants in Beijing and Shanghai, and had a weaker daughter preference than participants in Shanghai.

Table 5. ANOVA for demographic characteristics and behaviours for four cities.

			1 Changchun	2 Shanghai	3 Beijing	4 Shenyang	F-Ratio	P > F
A	Ages	*n*	234	218	227	257	0.43	0.73
		Mean	28.7	28.9	28.5	28.6		
B	Education	*n*	234	218	227	257	0.25	0.61
		Mean	14.6	16	15.9	14.5		
C	WedAge	*n*	217	207	215	243	6.18	0
		Mean	26.2	27.1	27	26.5		
		Sig. different	2, 3	1, 4	1, 4	2, 3		
D	KidAge	*n*	190	161	168	196	2.97	0.03
		Mean	29	29.6	29.6	29		
		Sig. different	2, 3	1, 4	1, 4	2, 3		
E	Interval	Mean	2.9	2.8	2.9	2.7	0.59	0.62
		n (same for the rest)	235	218	227	258	1.3	0.27
F	TotalBoy	Mean	0.41	0.36	0.33	0.4		
G	TotalGirl	Mean	0.41	0.35	0.38	0.39	0.6	0.62
H	F–G	Sig. different	No	No	No	No	30.18	0
I	TotalKid	Mean	0.83	0.71	0.71	0.79	2.91	0.03
		Sig. different	2, 3	1	1			
J	BoyDesire	Mean	0.65	0.39	0.41	0.61	13	0
K	GirlDesire	Mean	0.59	0.46	0.49	0.55	2.83	0.04
		Sig. different	2, 3	1	1			
L	J–K	Sig. different	No	No	No	No	6.56	0
M	TotalDesire	Mean	1.31	0.89	0.95	1.23	14.4	0
N	M–I	Sig. different	Yes	Yes	Yes	Yes	25.3	0
O	SonPref%	Mean	0.18	0.11	0.12	0.16	2.48	0.06
		Sig. different	2, 3	1	1			
P	DaughterPref%	Mean	0.14	0.22	0.21	0.15	2.08	0.1
		Sig. different	2	1				
Q	O–P	Sig. different	No	Yes	Yes	No	2.45	0
R	NoPref%	Mean	0.51	0.55	0.53	0.52	0.11	0.95

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The level of socio-economic development appears to be the main explanation for these differences between the most developed cities of Beijing and Shanghai and the relatively less developed cities of Changchun and Shenyang. Although the participants from the urban districts of the four cities had similar ages and educational levels, their social and cultural environments were not the same, and this may have affected their cultural values. As mentioned before, Shanghai and Beijing are larger cities and had lower total fertility than Changchun and Shenyang. They are also among China's most modern and open cities, in which modern popular cultural values concerning marriage and child-bearing are more accepted. On the other hand, traditional values are stronger in Changchun and Shenyang.

CONCLUSIONS

Wang and Yang (1996) reported that the long first birth interval (interval between marriage and the couple's first birth) was around 34 months in the 1950s, making it one of the most prominent features of Chinese demography. However, the interval decreased from 27 to 16 months from 1970 to 1985. They found that shorter intervals were an outcome of increased sexual activity among young couples, as arranged marriages gave way to love marriages. Helped by increased levels of female education and employment and sex education, greater intimacy in love marriages raised the chances of early pregnancies: an unintended consequence of the family planning programme. In this sample the decreasing trend of intervals appears to have reversed, with an increase from 1.34 to 2 years between the parents and participants who had children (Table 4): an increase by a third between these two generations. If all participants are considered, the interval was 3.48 years, or 41.76 months, 23% higher than the 1950s level (Table 1). It shows that young couples were not only marrying late, but also purposely delaying their first births.

Hudson and den Boer (2003) drew attention to the ticking time bomb of sex ratio imbalances in Asia, regarding it as one of the overlooked 'megatrends' of our time, a phenomenon that threatens domestic stability and international security in the twenty-first century. China today has the most sexually skewed adolescent and young adult populations in the world; boys outnumber girls at birth by a ratio of 117 or 118 to 100, according to China's 2000 Census (Fan, 2002; Riley, 2004; Kahn, 2004). The normal rate internationally is 103 to 107 males for every 100 females. The National Population and Family Planning Commission of China also regards the rising sex ratio imbalance as one of the most serious social problems (Zhang, 2005). The imbalance is commonly believed to be a rural problem (Croll, 2002; Bai, 2002; Zhu, 2003; Qin, 2004), although the imbalance appears to exist also in urban areas, including Beijing, Shanghai and Guangzhou (Shen, 2004). This research confirms that belief with the finding of a male–female ratio of 114 to 100 in all births by the participants. This finding suggests that gender imbalance is more widely spread, existing even in more developed districts of large cities. The imbalance is probably due mainly to gender-selective abortions (Zhu, 2003), because there were only a few suspected cases of unreported female births and no known cases of baby abandonment or infanticides in all the studied communities, based on personal interviews. The parents expressed stronger preference for sons. However, it did not appear that they took effective measures to get sons, possibly because most of them had more than one child. In contrast, the participants that claimed less son preference gave birth to significantly more boys than girls.

Demographers concluded that up to 60% of the variation in fertility changes in less developed countries is accounted for by social and economic developments, and that 15% can be attributed to the effects of family planning (Porter and Sheppard, 1998). The Chinese experience has been somehow different. According to these results, the family planning policy was the major reason for late marriages or late childbirth in the parents, followed by career and money. Among the participants, career and money were more important reasons than the one-child policy.

The research confirms that China's family planning policies played an important role in fertility decline, especially for the parents. On the other hand, other forces were at work also. In fact, the decline in the total fertility rate in China pre-dates the introduction of the one-child policy (Hussain, 2002; Zhu, 2003). The decline in fertility and birth rates was most rapid in the 1970s when total fertility fell by 52.7%, and birth rates

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dropped by 45.5% (Yu, 2000). Fertility decline started in the 1950s in Shanghai (Guo, 1996). Cultural changes have also been important reasons, especially changes in attitudes toward family size and gender, as shown by the intergenerational comparisons. Temporal changes and spatial differences indicated that higher incomes were associated with lower fertility rates. When the four cities are compared, income is negatively related to fertility. This supports the idea that social and economic developments have led to fertility decline in China (Peng, 1991; Pannell, 2003) and elsewhere (Porter and Sheppard, 1998). However, the relationship is reversed when we compare Shenyang and Changchun. Economic hardship in Shenyang due to the high unemployment rate may be one reason for this; overall, participants reported that lack of money was an important factor in their low reproductive desire.

There are limitations to this study. The findings were based on only four of the many large cities in China, and these were not selected randomly. The participants in the surveys were educated residents from more developed urban districts where childless families are more common. As a result, the findings relate to more developed urban districts in China's large cities. The intergenerational comparison has limitations also, due to the large age range from 18 to 40. The majority of the participants were between ages 24 and 36. There were 24 participants who were aged below 20. For these participants, their parents' fertility decisions were made after 1979, when the one-child policy was adopted, and in these cases intergenerational differences may be expected to be small.

Nevertheless, personal interviews and what has been reported in Chinese newspapers and government documents are generally consistent with the findings of this research. For example, *China Today* (2003) reported that Shanghai's 'double income no kids' (DINK) households hit 12.4% in 2003. DINK families make up about 11.42% of the all-childbearing age couples in Guangzhou, Guangdong Province (China Population Information and Research Center, 2003). *Xinhuanet* (2004) reported that about 10% of young married couples in Beijing say they do not intend to have children. These reports refer to the whole administrative regions of Shanghai and Beijing which include a large number of rural dwellers (National Bureau of Statistics of China, 2004). This research excluded the *shixia xian* areas and the less developed districts in the city, which tend to have fewer childless families (*Xinhuanet*, 2004), but the percentage of childless families was very similar to the *Xinhuanet* report (11.5% for all four cities). This research found that the average number of desired children was 0.89 in Shanghai and 0.95 in Beijing. The Shanghai Population and Family Planning Commission (PFPC) reported that the average desired number of children was 1.1 in Shanghai in 2003. The report was based on a survey of 20,649 people from 18 to 30 years old in both urban and rural districts of Shanghai (*Xinhuanet*, 2003).

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REFERENCES

Bai Z. 2002. Gender and fertility strategy in a Yi community. *Asia-Pacific Population Journal* **17**: 39–58.

Banister J. 1987. *China's Changing Population*. Stanford University Press: Stanford, CA.

Billari F, Frejka T, Hobcraft J, Macun M, van de Kaa DJ. 2004. Discussion of paper 'Explanations of the fertility crisis in modern societies: A search for commonalities', *Population Studies* **57**(3): 241–263, by Caldwell J and Schindlmayr T. *Population Studies* **58**: 77–92.

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Boyle P. 2003. Population geography: does geography matter in fertility research? *Progress in Human Geography* **27**: 615–626.

Caldwell JC. 2004. Demographic theory: a long view. *Population & Development Review* **30**: 297–316.

Caldwell JC, Schindlmayr T. 2003. Explanations of the fertility crisis in modern societies: A search for commonalities. *Population Studies* **57**: 241–263.

Caldwell JC, Schindlmayr T. 2004. Reply to the discussion of our paper 'Explanations of the fertility crisis in modern societies: A search for commonalities'. *Population Studies* **58**: 92–93.

China Population Information and Research Center. 2003. New marriage views affecting population growth. Speech by Weiqing Zhang, Director of the National Population and Family Planning Commission of China (NPFPCC), at the Fifth Asia-Pacific Population Conference. www.cpirc.org.cn/news20030129-1.htm [Accessed 20 August 2003].

China Today. 2003. Shanghai's DINK Households Hit 12.4 Percent. *February* **52**(2): 6.

Croll E. 2002. Fertility decline, family size and female discrimination: a study of reproductive management in East and South Asia. *Asia-Pacific Population Journal* **17**: 11–37.

Fan CC. 2002. Population Change and Regional Development in China: Insights Based on the 2000 Census. *Eurasian Geography and Economics* **43**: 425–442.

Graham E, Boyle PJ. 2001. (Re)theorising population geography. *International Journal of Population Geography* **7**: 389–394.

Greenhalgh S. 2003. Science, modernity, and the making of China's one-child policy. *Population and Development Review* **29**: 163–196.

Guo S. 1996. Determinants of fertility decline in Shanghai: development or policy? In *China: The Many Facets of Demographic Change*, Goldstein A, Wang F (eds). Westview Press: Boulder, CO; 81–96.

Harbison S, Robinson W. 2002. Policy implications of the next world demographic transition. *Studies in Family Planning* **33**: 37–48.

Hudson VM, den Boer AM. 2003. *Bare Branches: The Security Implications of Asia's Surplus Male Population*. MIT Press. Cambridge, Massachusetts.

Hussain A. 2002. Demographic transition in China and its implications. *World Development* **30**: 1823–1834.

Kahn J. 2004. The most populous nation faces a population crisis. *New York Times* **May 30, 153**: 1–2.

Lee JZ, Wang F. 1999. *One Quarter of Humanity: Malthusian Mythology and Chinese Realities, 1700–2000*. Harvard University Press: Cambridge, MA.

Milwertz CN. 1997. *Accepting Population Control: Urban Chinese Women and the One-Child Family Policy*. Curzon: Richmond.

National Bureau of Statistics of China. 2003. *2000 China County Population Census*. China Statistics Press: Beijing.

National Bureau of Statistics of China. 2004. http://www.bjstats.gov.cn/lhzl/cbtj/200402020012.htm [accessed 1 May 2004].

Pannell CW. 2003. China's demographic and urban trends for the 21st century. *Eurasian Geography and Economics* **44**: 479–496.

Peng X. 1991. *Demographic Transition in China, Fertility Trends since the 1950s*. Clarendon Press: Oxford.

Porter P, Sheppard E. 1998. *A World of Difference: Society, Nature, Development*. Guilford Press: New York.

Qin D. 2004. Increasing sex ratio among the newborns: analyses and suggestions, China.org. http://www.china.org.cn/chinese/zhuanti/2004lh/511198.htm [accessed 15 May 2004].

Riley NE. 2004. China's population: new trends and challenges. *Population Bulletin* **59**: 3–36.

Shen B. 2004. China's regional disparity in 1981–2000: Openness and development of non-state-owned enterprises and fiscal decentralization. *Chinese Geographical Science* **14**: 97–103.

Wang F, Yang Q. 1996. Age at marriage and the first birth interval: the emerging change in sexual behavior among young couples in China. *Population and Development Review* **22**: 299–320.

Xinhuanet. 2003. November 18, Investigation report: Ten characteristics of reproductive desire among Shanghainese. http://www.china.org.cn/chinese/renkou/444418.htm [accessed 1 October 2004].

Xinhuanet. 2004. May 25, Doing the DINK. http://news.xinhuanet.com/english/2004-05/25/content_1488831.htm [accessed 25 May 2004].

Yu, Xuejun. 2000. China enters post demographic transition, *China Demographic Research*, 2000, Issue 2, accessed online at http://www.chinapop.gov.cn/rklt/rkyjhsyyj/t20040326_1514.htm, October, 23, 2004.

Zhang WQ. 2005. Speech at National Tele-Conference on the 1300 Million Population Day by Weiqing Zhang, Director of the National Population and Family Planning Commission of China. http://www.npfpc.gov.cn/2005-01/news20050106-3.htm [accessed 12 January 2005].

Zhu WX. 2003. The one child family policy. *Archives of Diseases in Childhood* **88**: 463–464.

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