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Is the "seven-year itch" real?—a study on the changing divorce pattern in Chinese marriages

Qi Xu[1], Zeqi Qiu[2*] and Jianxin Li[3]

* Correspondence:
qiuzeqi@pku.edu.cn
[2]The Center for Sociological Research and Development Studies of China, Peking University, Beijing, China
Full list of author information is available at the end of the article

Abstract

Drawing from the data collected in the 2010 China Family Panel Study (CFPS) baseline survey, this paper studies the changing divorce pattern in Chinese marriages as a whole and for four cohorts. We find an inverted U-shape pattern in the divorce risk for Chinese marriages with the peak coming earlier over time. Family life cycle theory, natural evolvement theory, and population heterogeneity theory provide three different perspectives on interpreting the "inverted-U" shape divorce pattern. Family life cycle theory and natural evolvement theory are not supported by the data; however, population heterogeneity theory fits the data quite well. Split-population model shows that divorce risk for divorced couples increase linearly with marriage duration. However, the curve must come down at the end since the majority of the population does not divorce. By comparing four cohorts divided by marriage year, we find that the proportion of divorced couples has increased over time and the slope of the risk function for divorced couples has increased rapidly.

Keywords: Divorce pattern, Family life cycle, Natural evolvement theory, Population heterogeneity, Split-population model

Research question

Much research has shown that industrialization, modernization, and the subsequent changes to social structures, cultures, and legal systems have had a profound impact on the world's family structures and functions (Goode, 1986). The increasing instability of marriage as well as an increase in the divorce rate has become common phenomena across the world (Zhang, 1997). China is no exception. Since the 1980s, China has experienced rapid economic growth, attitudes to family have become increasingly open, and the marriage law was amended with a "non-fault" divorce amendment. All of these have contributed to China's rapid increase in the divorce rate. As Fig. 1 shows, in 1979, there were only 319,000 divorced couples nationwide and the crude divorce rate then was only 0.3‰. In 2009, however, these two indexes have reached 2,468,000 and 1.85‰ respectively, with yearly increases of 7.1 and 6.3 %.

The increase in the divorce rate over the years and the numerous social problems resulting from it have brought about the widespread attention of the Chinese academy (Xu & Ye, 2001; Xu, 2012; Lu, 2009; Xu et al., 2013). However, existing research has

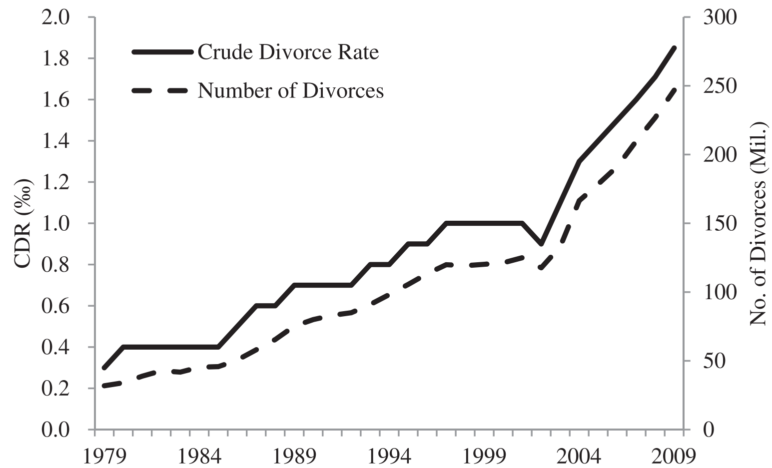

Fig. 1 Growth curve of number of divorces and crude divorce rate since 1978. Source: Institute of Population and Labor Economics, Chinese Academy of Social Sciences, 2010

mostly focused on the incidence and influencing factors of divorce, but rarely has research investigated the divorce pattern of Chinese marriages, i.e., how divorce risk changes over the course of a marriage. Theoretically, divorce level and divorce pattern are two different concepts: the former emphasizes the incidence of divorce (i.e., whether the divorce rate is high or low), whereas the latter looks at the timing of divorce (i.e., when marriage is most likely to break down). Therefore, investigating divorce pattern and its change over time provides a new lens to look at the changing marriage instability in China.

Three theoretical explanations for divorce pattern

Divorce pattern is a dynamic describing the changing divorce risk for a marriage. Studies on Western societies have shown that the divorce risk function has an inverted U-shape curve, indicating that divorce risk first gradually increases according to the duration of marriage and then decreases steadily after reaching its peak (Schoen, 1975; Andersson, 1997; Lyngstad, 2004). With regard to the inverted U-shape divorce pattern, there have been three different theoretical explanations.

The influence of family life cycle

The first theoretical approach suggests that the inverted U-shape divorce pattern reflects the family life cycle, especially the influence of children. The time from getting married to having the first child is the “honeymoon” period; the marriage quality of this period is high so the divorce risk is low. However, the birth of the first child may break the honeymoon period because both the wife and the husband need to adjust to their new roles as parents after having children. The more children a couple has, the more time and energy they must spend on their children and, as a result, they have less time for themselves (Rollins & Galligan, 1978). This may weaken the quality of their marriage and increase the risk of divorce (Waite & Lillard, 1991). However, as children grow older and become increasingly independent, the time and energy needed to rear them gradually decreases (Heaton, 1990). As grown-ups, children live independently, allowing parents to return to the lover's world, which then may increase their satisfaction with marriage and reduce the risk of divorce (Glenn, 1975; Waite & Lillard, 1991).

Therefore, from the perspective of the family life cycle theory, it is the dynamic change of the number of children and the children's age with the duration of the marriage that causes the inverted U-shape divorce pattern. Nonetheless, this explanation clashes with various empirical studies.

Firstly, several studies have shown that the divorce risk decreases significantly after giving birth to children, and the more children a couple has, the less likely it is that they will divorce (Thornton, 1977; Heaton, 1990; Waite & Lillard, 1991; Xu et al., 2013). Becker et al. (1977) argue that children are a significant investment in a couple's marriage. Different from other forms of marriage capital, children naturally belong to both spouses; thus, the more children a couple has, the lower possibility of divorce. Fei Xiaotong (1999) also pointed out that, as a medium binding couples biologically and psychologically, children create a common task that has to be undertaken by parents. And the mutual dependence or "organic unity" generated during the process of rearing children is beneficial to the stability of a marriage (Morgan et al., 1988; Durkheim, 2000). Moreover, after having children, pressure from social norms and cultural traditions may grow to further discourage divorce. Realizing "divorce can affect children negatively" and hoping that their children will grow up healthily, some emotionally damaged couples may choose to sustain their marriage (Thornton, 1977). Thus, children may be both the cause of divorce and a key stabilizer of marriage.

Secondly, contrary to the expectation of the family life cycle theory, studies have also shown that younger children have a more positive impact on marriage stability than older ones (Waite & Lillard, 1991; Heaton, 1990; Xu et al. 2013). A possible explanation is that looking after young children demands more time and energy from parents, so the husband and wife can maximize their contribution through labor division. What is more, parents may also believe that divorce poses greater harm to young children, so parents may be more reluctant to divorce when their children are young.

Based on the above, although the family life cycle theory coheres to the inverted U-shape divorce pattern, it contradicts empirical studies. Consequently, it is not reasonable to attribute the inverted U-shape divorce pattern to the family life cycle (i.e., number and age of children). Therefore, we have to look for other theoretical perspectives to fully understand the changing divorce risk in marriage.

The natural evolution of marriage stability

Unlike the family life cycle theory, which emphasizes the role of children in divorce, some scholars take the inverted U-shape divorce pattern as the natural evolution over time of marriage stability.

After getting married, couples will experience a short "honeymoon period" when marriage satisfaction is very high and divorce risk is quite low. After the honeymoon, the quality and satisfaction with marriage will decline gradually over time. (Rusbult et al., 1986). As time goes on, passion starts to fade and trouble starts to arise; therefore, marriage gradually becomes less appealing to partners (Luckey 1966). According to

Levinger (1976), the attraction of marriage, whether it is referring to the physical attractiveness between spouses or referring to the actual attractiveness of the idea of being married, is the key factor to marriage stability. When the attraction of marriage decreases and alternatives appear, the possibility of divorce will increase evidently.

However, the decline in marriage satisfaction and the increase in divorce risk do not proceed consistently over time. The longer a marriage lasts, the more personal resources both spouses have invested in the marriage; as a result, the more loss both spouses will encounter if they choose to divorce (Xu & Ye, 1998). According to Becker et al. (1977), marriage duration is the sunk cost both spouses have "paid," so that the longer the duration, the less likely a couple is to divorce.

In short, although the continuation of a marriage is often accompanied by a weakening of marriage quality, the cost of divorce also increases correspondingly. The inverted U-shape divorce pattern is precisely the consequence of these two "forces." This explanation has been supported by some researches. For example, a descriptive research by Johnson et al. (1986) showed that marriage satisfaction and marriage quality both initially increase at first and subsequently drop after reaching the peak.

However, this descriptive research only captured how the level of marriage satisfaction and marriage quality changed over time. It did not consider number or age of children. Neither did it take into account the third approach discussed in this article, i.e., population heterogeneity.

Population heterogeneity

Family life cycle theory and natural evolution theory share a default hypothesis, i.e., the research population (couples) are highly homogenous. Nonetheless, every marriage is de facto different. On the one hand, the attractiveness of marriage varies from couple to couple and the intensity and frequency of conflicts also varies from couple to couple. On the other hand, every couple's endurance of marital conflicts and the ability to deal with them also differ. As a consequence, the marriage satisfaction and divorce risk for every specific couple vary widely at any given point of time. Inspired by the concept of population heterogeneity, Vaupel and Yashin (1985) provided another explanation for the inverted U-shape divorce pattern.

Population heterogeneity presumes that every couple's divorce risk is different and couples that will divorce only represent a small fraction of the whole population. Vaupel and Yashin (1985) maintained that there are at least two different subpopulations: for subpopulation 1, divorce will never happen, i.e., $h_1(t) = 0$, while for subpopulation 2, the divorce risk increases over time, which can be depicted as a linear function of time, i.e., $h_1(t) = b * t$.

As time goes by, unstable marriages will break up one by one, and stable marriages will last till the end. In this way, the proportion of subpopulation 2 will steadily decrease over time, whereas the proportion of subpopulation 1 will steadily increase. Therefore, the observed divorce risk function must show an inverted U-shape pattern. In this way, Vaupel and Yashin argued that the "seven-year itch" does not exist at all; the inverted U-shape divorce pattern is only the result of population heterogeneity.

At first glance, Vaupel and Yashin have provided a seemingly convincing explanation for the inverted U-shape divorce pattern. Yet, their explanation to some extent is an ex post facto explanation. In terms of the ending of each marriage, it is true that some couples divorce and some couples do not, or with the words of Vaupel and Yashin, some couple's divorce risk is 0 whereas others are greater than 0. However, in terms of the process of marriage, the risk of divorce should always be greater than 0 as long as a couple remains married. Therefore, we cannot tell couples of subpopulation 1 from couples of subpopulation 2 unless we observe the end of every couple. In spite of this, explaining the divorce pattern from the perspective of population heterogeneity is still very novel and attractive. And from this perspective, we can further extrapolate that the shape of the overall divorce risk function is mainly influenced by two factors: first is the proportion (p) of the couples who will eventually divorce—the greater the proportion, the higher the position of the risk function, and the later the divorce pattern arrives at its peak value (i.e., the "itch'"); second is the rate of divorce—the faster the rate, the higher the position of the risk function, and the earlier the risk function reaches its peak value (Vaupel & Yashin, 1985).

Can this explanation be validated? We will use data collected in China to answer this question.

Data, variables, and model

Data

The data used in this study was drawn from the baseline survey of the Chinese Family Panel Study (CFPS) in 2010. CFPS is a large-scale comprehensive social survey conducted by the Institute of Social Science Survey at Peking University. This survey employs an implicit stratified multistage PPS sampling design and covers twenty-five provinces in mainland China (excluding Inner Mongolia, Xinjiang, Tibet, Hainan, Ningxia, and Qinghai), representing about 95 % of the Chinese population.

CFPS 2010 received a total of 14,960 valid family level questionnaires, included 14,798 household questionnaires, 33,600 adult questionnaires, and 8990 child questionnaires.[1] The total response rate was 81.3 %. This study is mainly based on the married adult samples. The analysis unit is the pair in "first marriage." If both spouses in their first marriage answered the adult questionnaire, they were counted as one couple. After deleting unreasonable values[2] and removing missing values, 16,472 pairs of first marriages included in the analysis.

CFPS asked about each couple's marital history, including the date of their first marriage, respondent's birth date and that of their first spouse, whether their first marriage ended in divorce and the date of divorce, and whether their first spouse died and the date of death. Based on this information, we can thoroughly analyze the changing divorce risk over time.

Marriage cohort

In order to explore the changing divorce pattern over different historical periods, the total valid sample is split into four marriage cohorts for analysis: before 1980, 1980–1989, 1990–1999, and after 2000. The rationale for grouping is mainly based on the transitional stages of the Chinese economic structure (Qiu & Liu 2013).

Firstly, the socioeconomic background and legal institutions for divorce underwent a dramatic change around 1980. Zeng (1995) pointed out that, before 1980, because of the Confucian cultural tradition and the influence of the Cultural Revolution, the divorce rate in China was extremely low. However, after 1980, rapid economic growth and increasing living standards prompted individuals to strengthen their expectations for quality of married life; at the same time, increasing modernity and openness to public opinion and lifestyles reshaped people's attitudes towards divorce. Moreover, owing to the influence of the 1980 "non-fault" divorce amendment to the Chinese marriage law, the divorce rate in China began to increase steadily after 1980. With this background, we grouped all couples into two cohorts: before 1980 and after 1980. Considering the dramatic social and economic changes occurring after 1980, we further classified the couples married after 1980 into three cohorts, i.e., 1980–1989, 1990–1999, and after 2000.

In the 1980s, the Chinese society and economy experienced unprecedented transformation. The 1980s marks the exploratory and primary stage of China's economic reform. During this period, the biggest changes happened in the countryside. For example, people's communes were abolished; the Household Contract Responsibility System became a main stream in rural area, and at the same time, various rural industries developed rapidly (Davis & Harrell, 1993). In cities, however, the planned economy continued in spite of some noticeable changes, such as the improvement in living standards and the emergence of consumerism (Whyte & Parish, 1984). During this period, the domain of marriage and family in China did change to some extent: e.g., the shrinking of family size and the increase in divorce rate. But overall, the traditional system of marriage and family in China did not experience any fundamental changes (Davis & Harrell, 1993).

In the 1990s, China experienced massive changes due to marketization. Especially after Deng Xiaoping's "Southern Tour Speech," China entered a new stage of deepening reform. In order to establish the dominant role of the market in resource allocation, the state gradually retreated from the regulation of and intervention in the Chinese economy (Zhang, 2004). For example, state-owned industries underwent profound reforms: privatized, co-funded, shareholding, and other forms of ownership-based economies were allowed to develop, and at the same time, the limits to population migration were also loosened (Whyte, 2005). Such reforms not only stimulated rapid economic growth in China, but they had a strong impact on Chinese marriages, families, and private lives as well (Yan 2006). The miniaturization of family was increasingly evident and the nuclear family became the dominant form in China (Zeng & Wang, 2004; Wang 2006); at the same time, marriage stability decreased gradually while the divorce rate increased rapidly (Ye & Lin 1998; Zhang 1997).

After 2000, China continued its stride in economic reforms. After joining the World Trade Organisation (WTO) in 2003, communication and collaboration between China and the rest of the world steadily increased; during this process, the Western idea of pursuing individual happiness through marriage became more and more appealing to Chinese people, which—from the point of view of many researchers—is fundamentally detrimental to marriage stability in China (Li 2009; Ye & Lin 1998). Along with the rapid pace of urbanization and the massive population migration, the social bonds built on blood and geographical proximity broke apart; as a result, the traditional norms that had shaped marriage behavior also lost its footing. Under such circumstances, the divorce rate in China increased at a faster rate after 2000 (Fig. 1), compared to other periods in recent Chinese history.

Measurement of the factors related to children

From the perspective of family life cycle theory, the child is the dominant influential factor on divorce pattern. In order to test this hypothesis, we measured the factors associated with children from three aspects, i.e., the number of children, children's age structure and gender structure. Notice that all three groups of variables are time-varying variables, which means that their value will change with the duration of marriage.

The number of children refers to the absolute number of children that couples have at a specific time point and is thus a time-varying variable. In order to distinguish the different influence each child has on their parent's marriage stability, we classified children into four categories based on their age, namely the number of children aged 0, the number aged 1 to 5 years, the number aged 6 to 12 years, and the number of children aged 13 and over. The total of the four variables is the total number of children that couples have at a particular point of time. This categorization is based on Waite and Lillard (1991), which shows that couples experience a "honeymoon" period after each new birth and that the marriage is most stable during these times. Preschoolers (children under 6 years old) are strongly dependent on their parents, so couples' divorce risk is relatively low; however, children over the age of 13 adversely affect the stability of marriage. To test the applicability of these findings in China, this study places children into one of the four groups shown above.

Although family life cycle theory suggests that the number and age of children may affect divorce risk, it does not refer to children's gender. Considering that children's gender structure can also change during their parents' marriage, it is necessary to also consider it when studying the impact of children on marriage stability. Morgan et al. (1988) maintained that boys are more beneficial to marriage stability than girls. They suggest that fathers play a more important role in raising son(s), and thus are more involved in child rearing. In this case, the wife will feel more satisfied with the husband and thus marriage stability increases. In China, for cultural reasons such as carrying on the family line and practical reasons such as raising children for future old-age care, couples prefer boys, which may also render children's gender as a crucial factor for marriage stability. In our analysis, the variable reflecting the gender structure of children is a dichotomous variable. If the couple gave birth to boy(s) before a particular point of time, the value is 1, otherwise 0.

Control variables

Apart from marriage cohort and three groups of variables related to children, the couple's place of residency and the wife's age at marriage and education level were also controlled in the analysis. Since these variables are not only related to the factors for children but also have significant influence on divorce risks, they must be controlled in the model.

First, China's divorce rates showed significant differences between urban and rural areas (Zeng 1995; Wu 1999). And due to huge differences in the level of social development, cultural traditions, and fertility policies, the fertility rate in rural areas was much higher than that in urban areas (Guo 2004). In order to eliminate the confounding effect caused thereby, couple's urban/rural residency is controlled for in the model. In our analysis, rural-urban division is based on whether respondents lived in a village or an urban community. Strictly speaking, the place of residence may change over time because of migration and mobility, thus couple's rural/urban residency is also a time-varying variable. However, the data did not gather the migration history of respondents so we can only control for the place where respondents currently reside.[3]

Second, studies have found that couples' education level and age at first marriage also affect divorce risk. Years of education indicate the modernity of attitude towards marriage; thus, the higher level of education, the more likely they are to divorce. Studies on age at first marriage show that marrying too young negatively impacts marriage stability (Waite and Lillard 1991; Heaton 1990). Empirically, the husband's age at first marriage and education level are strongly correlated with the wife's, but the impact of wife's characteristics has a more direct impact on the children, and therefore in this study, we control for the wife's age at first marriage and her education level.

Finally, one important clarification: 2010 CFPS did not ask about the education level of the first spouse; thus, no information was gathered about the education level of a female spouse who had not completed an individual questionnaire nor about the education level of those already divorced or widowed. In the panel survey in 2012, CFPS supplemented this question, allowing us to draw the missing values from the new responses. However, due to various causes, there are also some missing values for female spouse's education level, especially for those who had previously divorced. In order to avoid losing too many cases, we added a category named "missing value" when there were problems with the female spouse's education level.

Split-population model

Vaupel and Yashin point out an intrinsic defect of traditional survival analysis when they first explained the concept of population heterogeneity: i.e., so long as the time (t) of observation is long enough, the probability of any event will be close to 1 (Du 2008). This hypothesis is suitable for certain studies (e.g., studies on death, since death will inevitably happen to everyone at some point); but in terms of studies on divorce, this hypothesis is inadequate because not every couple's marriage ends in divorce. If we assume that all couples investigated would eventually divorce, the estimated divorce risk function would deviate from reality in a serious way.

In order to overcome this defect, Schmidt and Witte (1989) put forward the split-population model. This model assumes that any population can be divided into two groups: one group has a risk for a certain event; the other does not. This model can estimate the proportion of the second group in a given population (p). If p is greater than 0, then the split-population model is more suitable; and if there is no significant difference between p and 0, one could choose traditional survival models for analysis. Apart from estimating the value of p, one could also use split-population model to investigate the effect of all kinds of independent variables on the probability and timing of an event just as is true of traditional survival models.

The split-population model has been widely employed in epidemiology and biostatistics. In such fields, the model is known as the "cure model," because it is often used to determine whether a patient, upon taking a particular medicine, can recover from a disease and when the recovery will happen (Lambert, 2007). Similar to divorce, since not every patient taking a medicine will eventually recover, traditional survival models are not suitable, but split-population model can effectively solve this problem.

In sociology, the split-population model has been applied in a number of studies. For instance, when studying the probability of convicts returning to prison, Schmidt and Witte (1989) abandoned traditional survival models and instead put forward a split-population model, simply because not every convict would commit a new crime and be sent back to prison. However, the split-population model has not received sufficient attention from Chinese social scientists. To our best knowledge, this article marks the first use of this model to study divorce patterns and its changing tendencies in China.

Results

Sample description

Table 1 describes the marital status of all 16,472 couples when surveyed in 2010. 86.9 % of the couples were still in marriage by the end of the survey, 3.6 % had divorced, and 9.5 % were widowed. By marriage cohort, the proportion of widows gradually decreases over time whereas the proportion of divorce rate increases. Among those married between 2000 and 2010, the proportion of divorced couples is only 3.0 %, which is lower than those proportions for the 1980–1989 and 1990–1999 cohorts. This is mainly due to the fact that these couples had been married for relatively shorter periods of time than was true for the other three cohorts. Although most couples married after 2000 had not divorced by the end of 2010, it does not mean that they will not divorce in the future. Nevertheless, it is also unrealistic to assume that all of them will eventually divorce. Take couples married before 1980 as an example: they have been married for at least 30 years by the end of 2010, but the proportion of those remaining in their first marriage was 75.4 %, and widows accounted for 22.7 % of the entire group. This means that in China, marriage is in general stable, while divorce is relatively uncommon.

Table 2 shows the basic characteristics of all couples by marriage cohort. Two-thirds of the sampled couples lived in rural areas, and one-third lived in urban areas. Among all of the couples, female spouses with only an elementary or lower education in total was 60.3 %; the proportions of secondary school graduates, high school graduates, and those who received higher education were 21.2, 10.5, and 4.1 %, respectively, and missing data cases in total were 3.9 %. On average, women married at the age of 22. Over time, the proportion of couples currently residing in cities increases gradually, and female spouses' education level and their age at first marriage increase as well.

Table 3 depicts the change in number of children, age, and gender structure for the duration of marriage. Over the duration of the marriage, the number of children

Table 1 Marital status by marriage cohorts in 2010

	Before 1980	1980–1989	1990–1999	2000–2010	All
Married (%)	75.4	89.7	92.9	96.7	86.9
Divorced (%)	1.9	4.7	5.2	3.0	3.6
Widowed (%)	22.7	5.5	1.9	1.3	9.5
Sample size	5,447	4,519	3,532	2,974	16,472

Table 2 Statistical description of the characteristics of all couples by marriage cohorts

Variables	Before 1980	1980–1989	1990–1999	2000–2010	All
Residence (%)					
• Countryside	68.7	67.8	65.4	64.7	67.0
• City	31.3	32.2	34.6	35.3	33.0
Wives' highest education level (%)					
• Elementary and below	79.0	57.1	55.1	37.0	60.3
• Secondary	9.1	24.1	25.3	33.9	21.2
• High school	3.9	13.5	11.5	17.0	10.5
• College and above	1.3	2.2	5.4	10.5	4.1
• Missing value	6.7	3.1	2.8	1.6	3.9
Wives' age at first					
Marriage	20.7	22.2	22.7	23.3	22.0
(year)	(3.5)	(3.3)	(3.5)	(4.1)	(3.7)
Sample size (pairs)	5,447	4,519	3,532	2,974	16,472

Note: (1) Standard deviations in parentheses

increases, the number of older children increases, and the number of young children decreases. With the increase in the number of children, the proportion who have boys also increases. Please notice in Table 2 that the sample size decreases with the duration of marriage. One reason is that some divorced or widowed couples ended their first marriage before 2010. These couples do not appear in subsequent years after divorce or losing a spouse. In addition, some married couples only had a very short marriage history when they were surveyed. For example, couples that married in 2006 cannot be part of the sample of marriages of 10 or 20 years since they were surveyed in 2010.

Figure 2 depicts couples' divorce risk and how it changes over time. Consistent with the findings in other countries, the divorce risk function of Chinese couples is also like an inverted U-shape curve, whose peak value appears around the seventh year of marriages. This happens to have the same value with "the seven-year itch" that people are familiar with.

However, the divorce risk function changes significantly over time. In Fig. 3, the height of the four curves is arranged in strict order of four marriage cohorts, which definitely reflect the difference in the level of divorce rate among the four cohorts. In addition to this, the shapes of the four curves also differ. For those married before 1980, the divorce risk function is almost a flat line, whereas the functions of the other three cohorts are all inverted U-shape curves. In terms of time until a function reaches

Table 3 Changes in number of children, children's age, and gender in the duration of marriage

Variables	Married for 2 years	Married for 5 years	Married for 10 years	Married for 20 years
Number of children	0.8	1.3	1.9	2.4
• Aged 0	0.2	0.1	0.1	0.0
• Aged 1–5	0.6	1.2	0.6	0.1
• Aged 6–12	0.0	0.0	1.2	0.5
• Aged 13 and above	0.0	0.0	0.0	1.8
Having son	0.4	0.6	0.7	0.8
Sample Size	15,880	14,880	13,442	9,820

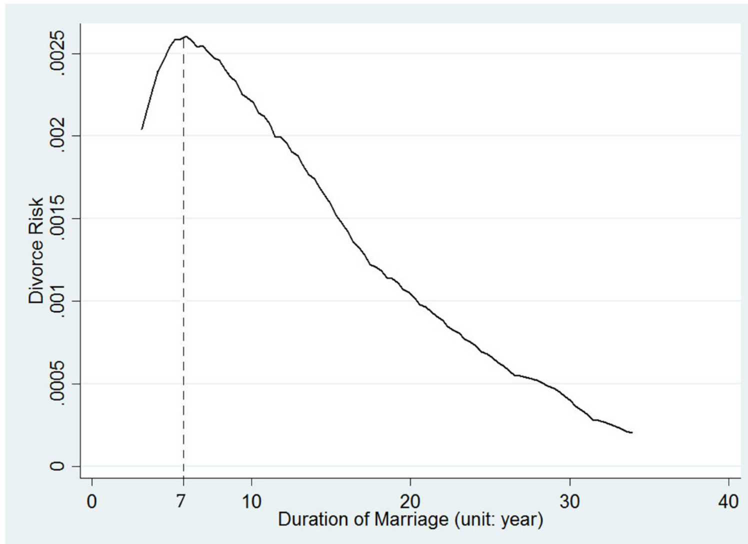

Fig. 2 Divorce risk over time (full sample)

its peak value, we can see that for those married between 1980 and 1989, it is about 11 years after marriage, for the 1990–1999 group, it is 8 years after marriage, and for the 2000–2010 group, it is 5/6 years. To summarize, the peak value of the divorce risk function becomes earlier and earlier over time.

Traditional survival analysis

According to family life cycle theory, children are the main factor in shaping the divorce risk pattern as an inverted-U curve. We use Cox proportional hazard model and discrete time hazard model to test this hypothesis.

Table 4 lists the results of Cox proportional hazard model. We use two types of Cox proportional hazard models. One is the classic Cox model in which marriage cohort is set as a normal control variable, i.e., assuming that the shape of the divorce risk function remains the same for all cohorts, while the level of divorce risk can be

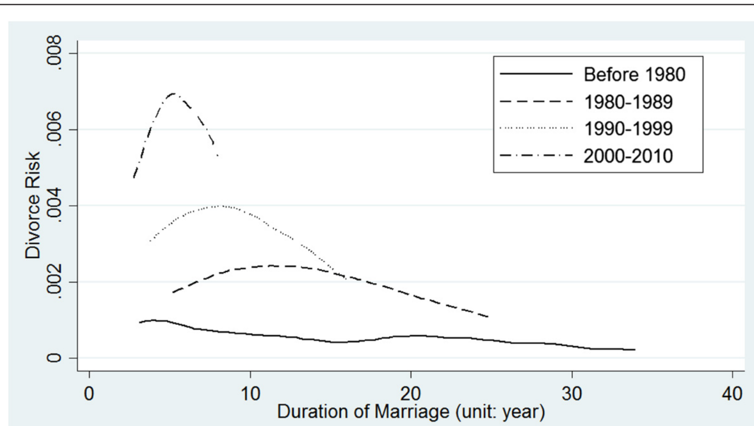

Fig. 3 Divorce risk over time by marriage cohorts

Table 4 Results of Cox proportional hazard model

	Classic Cox		Stratified Cox	
	Coefficient	Standard error	Coefficient	Standard error
Marriage cohort (before 1980 = 0)				
• 1980–1989	1.253***	0.129		
• 1990–1999	1.768***	0.138		
• 2000–2010	2.318***	0.168		
City (countryside = 0)	0.569***	0.092	0.556***	0.092
Wife's first marriage age	−0.026*	0.011	−0.027*	0.011
Wife's education level (Elementary School or below = 0)				
• Secondary school	0.313*	0.129	0.313*	0.129
• High school	0.348*	0.152	0.350*	0.152
• College and above	0.368+	0.210	0.375+	0.210
• Missing value	3.309***	0.113	3.292***	0.113
Number of children				
• No. of children aged 0	−1.874***	0.311	−1.820***	0.312
• No. of children aged 1–5	−0.830***	0.102	−0.816***	0.104
• No. of children aged 6–12	−0.700***	0.102	−0.725***	0.105
• No. of children older than 13	−0.472***	0.110	−0.494***	0.109
Having son (no = 0)	−0.209*	0.098*	−0.212*	0.098
Quasi-likelihood radio chi-square	1471.02***		1249.40***	
df	14		11	
Sample size	16,472		16,472	
Person-years	408,487		408,487	

Note: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

different. The second type is the stratified Cox model. In this model, marriage cohort is regarded as a layer variable, i.e., assuming that the shape and level of the divorce risk function are different in every cohort. By doing this, we cannot attain the regression coefficients of marriage cohort from stratified Cox proportional models. As is seen in Fig. 3, the stratified Cox model is more realistic than the classic model; however, the estimated regression coefficients and their statistical test results are nearly the same in the two models.

Table 4 shows that those married before 1980 have the lowest divorce risk, but as time goes on, the divorce risk increases significantly. Couples living in cities have a higher divorce risk than those living in the countryside; the younger the female spouses' first marriage age, and the higher their education level, the higher the divorce risk. All of these are in accordance with the results of earlier studies (Waite & Lillard, 1991; Heaton, 1990). Notice that when wives' education level is missing, statistically, the divorce risk becomes extremely high, but the fact may not like the model showed.

Table 4 also shows that divorce risk decreases significantly as the number of children increases, after controlling other variables. In comparison to older children, children of age 0 play the greatest role in protecting their parents' marriage, those aged 1–5 come second, 6- to 12-year olds third, and those of 13 years and above least. These findings are consistent with those in Western countries but are contradictory to the hypothesis of family life cycle theory. To summarize, like in other countries, children, especially younger children, have a notably positive effect on stabilizing marriage in China.

Finally, let us pay attention to the effect of children's gender structure. Table 4 shows that having a boy may significantly reduce a couple's divorce risk when other variables are controlled. On the one hand, as Morgan et al. (1988) pointed out, fathers may take more responsibility to look after boy(s), rather than girls, at home; on the other hand, in China, the influence of children's gender on divorce may also be attributed to parents' special preference for son(s) over daughter(s).

Apart from using Cox proportional hazard models, we also use discrete time hazard models to test the reliability of the findings above. The results of discrete time hazard models are listed in Table 5.

Table 5 Results of discrete time hazard model

	No interaction		With interaction	
	Coefficient	Standard error	Coefficient	Standard error
Marriage duration	0.179***	0.023	0.118***	0.035
Square of marriage duration	−0.006***	0.001	−0.004***	0.001
Marriage cohort (before 1980 = 0)				
1980–1989	1.233***	0.129	0.710*	0.340
1990–1999	1.814***	0.138	0.987**	0.363
2000–2010	2.396***	0.171	0.246	0.543
City (countryside = 0)	0.601***	0.093	0.586***	0.093
Wife's first marriage age	−0.023*	0.011	−0.026*	0.011
Wife's education level (elementary and below = 0)				
Secondary school	0.295*	0.129	0.293*	0.129
High school	0.328*	0.153	0.327*	0.153
College and above	0.343	0.210	0.347+	0.210
Missing value	3.411***	0.114	3.371***	0.114
Number of children				
No. of children aged 0	−1.800***	0.310	−1.754***	0.310
No. of children aged 1–5	−0.624***	0.092	−0.767***	0.098
No. of children aged 6–12	−0.695***	0.093	−0.736***	0.097
No. of children aged 13 and above	−0.623***	0.107	−0.545***	0.105
Having son (no = 0)	−0.203*	0.100	−0.218*	0.099
Marriage duration*1980–1989 cohort			0.123*	0.052
Marriage duration*1990–1999 cohort			0.279***	0.074
Marriage duration*2000–2010 cohort			0.945***	0.208
Square of marriage duration*1980–1989 cohort			−0.005***	0.002
Square of marriage duration*1990–1999 cohort			−0.016***	0.004
Square of Marriage duration*2000–2010 cohort			−0.082***	0.020
Intercept	−7.890***	1.285	−7.460***	0.333
Qausi-likelihood radio chi-square	1720.20***		1769.70***	
df	16		22	
Sample size	16,472		16,472	
Person-years	408,487		408,487	

Note: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

The advantage of the Cox proportional hazard model is that one does not have to set the specific function form of divorce risk; in contrast, when using the discrete time hazard model, one must set it. Since the overall divorce risk function appears as an inverted U-shape curve in Fig. 2, we choose quadratic curve to fit the function.

Corresponding to the previous Cox models, Table 5 also consists of two different types of discrete time hazard models: the first type (without interaction term) assumes that the shapes of the divorce risk functions remain the same for different marriage cohorts, while the second type (with interaction term) assumes that the shapes of the divorce risk functions for different cohorts may differ.

Once again, Table 5 proves all the results of the Cox model in Table 4. Firstly, divorce risk increases over time for different married couples. Secondly, couples living in cities have a significantly higher divorce risk than those living in the countryside; the younger a woman's first marriage age, and the less educated she was, the greater the divorce risk. Lastly, the more children a couple has, the less likely they are to divorce. Children of younger age may significantly protect their parents' marriage. And finally, couples having boy(s) are much less likely to divorce than those without a boy.

Apart from the findings above, discrete time hazard model can conduct a formally statistical test in terms of the shapes of divorce risk functions among different marriage cohorts. As is shown in Table 5, all the interaction terms between marriage cohort and the duration of marriage (including its square term) are statistically significant, which indicates that the shape of divorce risk function has changed significantly over time.

Figure 4 shows the divorce risk function of four marriage cohorts derived from the discrete time hazard model (with interaction terms) in Table 4. In comparison, we also give the corresponding results of the stratified Cox proportional hazard model, as shown in Fig. 5.

We can observe that there is no obvious difference between the two figures. Therefore, using a quadratic curve to fit the overall divorce risk function has been successful. Compared to Fig. 3, in which no variable is controlled for, there is no obvious difference. Therefore, no matter whether we control variables associated with children or not, the shape of the divorce risk function does not change too much, which further implies that the family life cycle theory is not supported. Since this theory suggests that children are the main factor causing the inverted U-shape divorce pattern, it is sensible

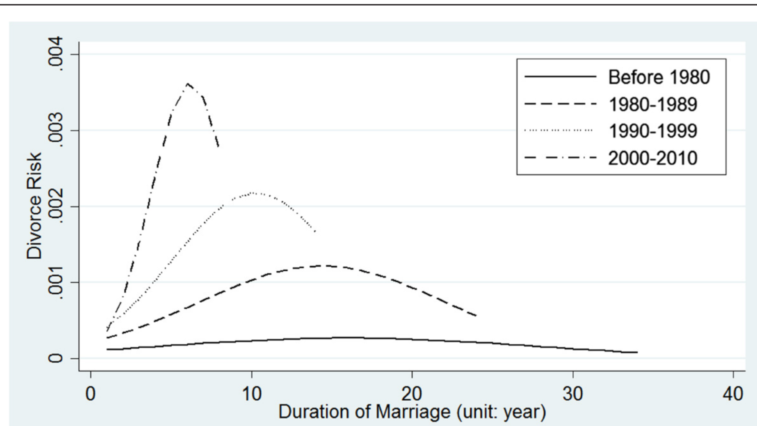

Fig. 4 Predicted divorce risk function by marriage cohorts using discrete time hazard model with interactions

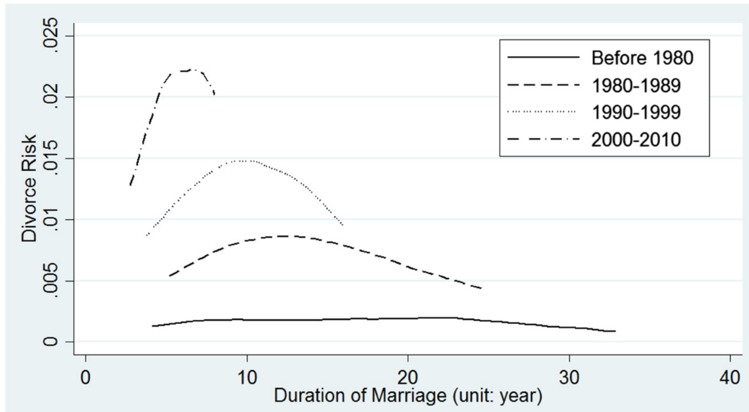

Fig. 5 Predicted divorce risk function by marriage cohorts using stratified Cox proportional hazard mode

to deduce that if we control the variables related to children, the inverted U-shape pattern should have changed accordingly; however, it does not change, which implies that the shape of divorce risk function is probably influenced by other factors.

Split-population analysis

Traditional survival analysis shows that the number of children, their age, and gender structure are not the main factors to influence couples' divorce pattern over time. What remains to be done, however, is to examine whether the inverted U-shape divorce pattern is the result of the natural evolution of marriage stability over time or of population heterogeneity.

The biggest difference between natural evolution theory and population heterogeneity is the rationale they offer to explain why divorce risk decreases after reaching its peak value. The former maintains that the sunk cost of marriage itself increases over time, and this eventually causes divorce risk to decline. According to natural evolution theory, then, the decrease in divorce risk is a real reflection of the change of marriage stability over time. Population heterogeneity, on the other hand, suggests that there are couples in the population who will not divorce under any conditions; and as time goes on, the proportion of these couples will gradually increase, contributing to the decrease in divorce risk over time.

In order to examine these two theories, we remove from our sample couples who remain married; instead, we focus on divorced couples and examine how their divorce risk changes over time. [4]According to population heterogeneity theory, the existence of the subpopulation having no divorce risk seriously interferes with the estimation of the overall divorce risk function; hence, the divorce risk function of divorced couples should substantively differ from the overall divorce risk function. In contrast, natural evolution theory assumes that the divorce pattern of those already divorced does not depart too much from the overall divorce pattern, and so this should also appear as an inverted-U shape.

From Figs. 6 and 7, we can see that the theory of population heterogeneity seems more suitable for the case of China. The two figures both show that the divorce risk function for divorced couples increases monotonically over time, which is markedly

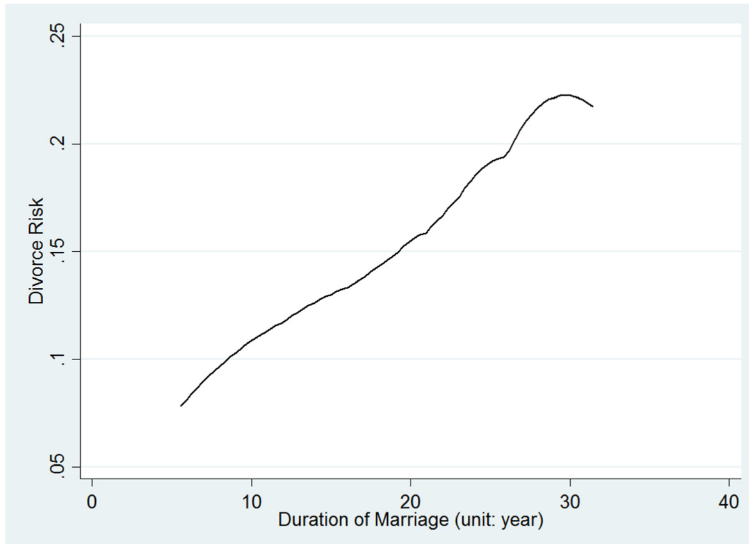

Fig. 6 Divorce risk function for divorced couples

different from the overall inverted U-shape divorce pattern. For different marriage cohorts, the slope of the divorce risk function gradually enlarges, which indicates that as time goes on, the rate of divorce for the divorced couples has increased considerably.

Finally, we use the split-population model to test the findings above. Given that the divorce risk functions in both Figs. 6 and 7 are monotonically increasing lines, we use the Weibull distribution to fit the divorced couples' divorce risk function. Furthermore, given that the proportion of couples who do not divorce must be between 0 and 1, we use logit as the link function.

The results of split-population models, consisting of two parts, are shown in Table 6. The first part shows the estimate for the proportion of couples who do not divorce; the second part shows estimates for the shape parameter and location parameter of the divorce risk function.

First, we should clarify that a positive regression coefficient means that the possibility of divorce will be lower as the independent variable increases. This is because the

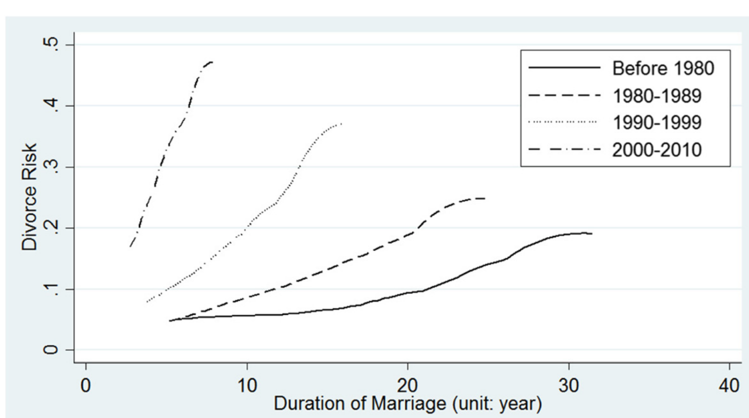

Fig. 7 Divorce risk function for divorced couples by marriage cohort

Table 6 Results of split-population model

	Model 1		Model 2	
	Coefficient	Standard error	Coefficient	Standard error
The proportion of couples who do not divorce (p)				
Marriage cohort (before 1980 = 0)				
1980–1989	−1.020***	0.137	−1.231***	0.188
1990–1999	−1.151***	0.144	−1.271***	0.210
2000–2010	−1.101***	0.173	−1.119***	0.265
City (countryside = 0)			−0.656***	0.110
Wife's first marriage age			0.021	0.014
Wife's education level (elementary and below = 0)				
Secondary school			−0.224+	0.135
High school			−0.214	0.162
College and above			−0.238	0.223
Missing value			−3.856***	0.147
Number of children				
Children aged 0			1.903***	0.336
Children aged 1–5			1.027***	0.112
Children aged 6–12			0.957***	0.108
Children aged 13 and above			0.803***	0.120
Having son (no = 0)			0.335**	0.109
Intercept	3.861***	0.104	2.914***	0.360
LocationpParameter (ln_lambda)				
Marriage cohort (before 1980 = 0)				
1980–1989	−1.387**	0.476	−0.479	0.476
1990–1999	−0.759+	0.461	−0.021	0.478
2000–2010	−1.244*	0.541	−0.150	0.557
Intercept	−3.593***	0.347	−5.392***	0.385
Shape parameter (ln_gamma)				
Marriage cohort (before 1980 = 0)				
1980–1989	0.326**	0.125	0.163	0.104
1990–1999	0.344**	0.129	0.231*	0.104
2000–2010	0.697***	0.138	0.490***	0.119
Intercept	0.232*	0.099	0.538***	0.084
Wald chi-square	81.88***		959.39***	
df	3		14	
Sample size	16,472		16,472	
Person-years	408,487		408,487	

Note: $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

dependent variable here is the proportion of couples who do not divorce. A negative regression coefficient, in contrast, means the possibility of divorce will be higher as the independent variable increases, which is exactly the opposite of the traditional survival analysis.

In model 1, only marriage cohort is included. From this model, we find that the proportion of couples who do not divorce decreases significantly over time. By using logit as the link function here, the intercept and regression coefficient are not direct estimates of proportions, but by means of a simple inverse operation, we can easily calculate these proportions. The calculation shows that among those married before 1980, 97.9 % of them will not divorce; for those married during 1980–1989, 1990–1999, and after 2000, the percentages decline to 94.5, 93.8, and 94 %, respectively. By the end of 2010, couples married after 2000 had only been married for a short period of time; therefore, model 1 probably underestimates the proportion of couples from this cohort who will not divorce. With this in mind, we can infer the proportion of couples who will eventually divorce increases over time. Nevertheless, marriages in China as a whole are still very stable, and only a small number of couples will eventually divorce.

Model 2 adds three groups of variables related to children and other control variables on the basis of model 1. Apart from marriage cohorts, rural/urban differences also have a significant influence on whether a couple will eventually divorce. Compared with those living in the countryside, couples living in cities have a much higher possibility of divorce. In addition, the more children couples have, the less possibility there is for them to divorce. And, as consistent with previous findings, younger children have a more positive impact on marriage stability; similarly, couples with son(s) are less likely to divorce than couples who have only daughter(s). Although there may be unobserved factors (e.g., marital relations) that affect both children and marriage stability, overall, in China, having children is a very important protective factor in terms of stabilizing marriages. It is clear that family life cycle theory is not supported empirically.

Model 2 shows that there is no significant difference among different marriage cohorts in terms of location parameters. The divorce risk at the onset of the marriage is nearly the same for different marriage cohorts. However, the shape parameters change significantly over time. As time passes, the shape parameters become bigger and bigger, which means that the slope of the divorce risk function for couples who will eventually divorce has gradually increased in China.

Figure 8 shows the predicted divorce risk function for couples who will eventually divorce based on model 2. It is very similar to Fig. 7. For couples who will eventually divorce, the divorce risk function increases monotonically as the marriage continues, and the slope of each line (i.e., the rate of divorce) also increases gradually for different marriage cohorts.

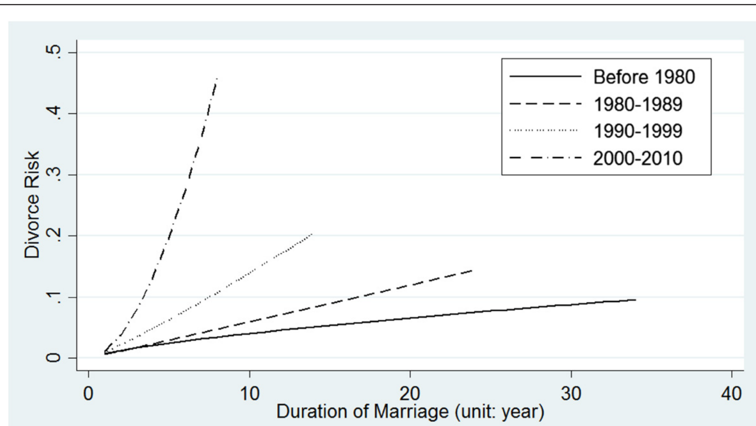

Fig. 8 Predicted divorce risk function for couples who will eventually divorce

In contrast, we also draw the predicted divorce risk functions of the four cohorts based on model 2 (see Fig. 9). This figure is similar to those drawn from the stratified Cox proportional hazard model and the discrete time hazard model shown previously but is substantially different from the divorce risk function for couples who will eventually divorce, as seen in Fig. 8. This demonstrates that it is the existence of the large majority of couples who will not divorce that is responsible for the overall inverted U-shape divorce risk function. Not only does this inverted-U curve fail to accurately reflect the changing divorce risk for couples who will eventually divorce over time, it also distorts the dynamic trend of the overall divorce pattern.

Combining these results with those in Fig. 8, we can now explain why it is gradually taking less and less time for the divorce risk function to reach its peak, as seen in graph 9. From the perspective of population heterogeneity, the smaller the proportion of couples who will eventually divorce, the steeper their divorce risk function, and the earlier the overall divorce risk function reaches its peak value. Although the proportion of couples who will eventually divorce has increased over time, the magnitude of this increase is limited; in contrast, graph 8 shows that the slope of the divorce risk function for couples who will eventually divorce has increased significantly since the 1990s. We would assert that the rapid increase in slope is the main factor causing the time of the itch to shorten year after year.

Conclusion and discussion

By analyzing data from the CFPS baseline survey conducted in 2010, we explored the divorce pattern in China and its change over time for four marriage cohorts.

Similar to Western countries, the divorce pattern in China is an inverted "U shape" curve with the peak at around 7 years, which coincides with the "seven-year itch" proverb. With four marriage cohorts, the divorce pattern changed significantly over time: not only did the level of the divorce risk increase considerably, but the peak value of the divorce risk function also appears earlier and earlier over time.

For such an inverted U-shape divorce risk function, family life cycle theory, natural evolution theory, and population heterogeneity theory provide three different explanations. Family life cycle theory argues that children have a negative impact on marriage

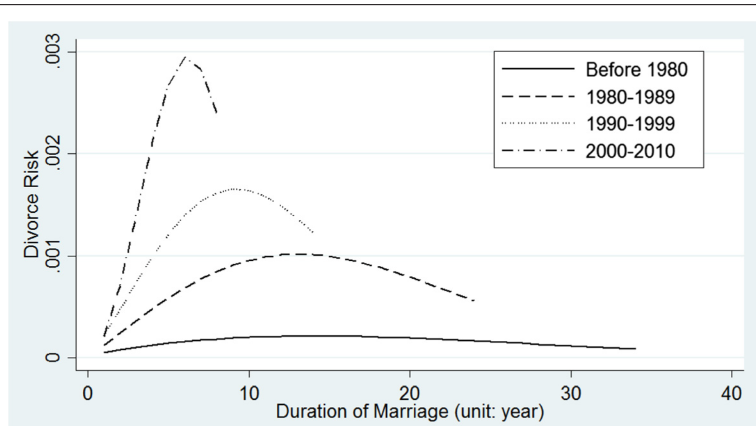

Fig. 9 The overall divorce risk function predicted by model 2

stability, and that the dynamic change of number of children and their age is the primary cause for the inverted U-shape divorce pattern. However, this theory is not supported empirically in the case of China. Both traditional survival analysis and the split-population model show that the more children a couple has, the lower their divorce risk, and the younger the kids, the stronger the protective effect they have on their parents' marriage.

Natural evolution theory states that the tension between marriage attraction and marriage cost changes over time, and this in turn affects marriage stability and further causes the inverted U-shape divorce risk function. However, our descriptive analysis and split-population analysis show that the divorce risk function for couples who will eventually divorce does not appear as an inverted U-shape curve; therefore, data from China does not support this theory.

In contrast, the theory of overall heterogeneity can adequately explain how divorce risk changes over time. As Vaupel and Yashin pointed out, what is so special about the phenomenon of divorce is that not every married couple will eventually divorce, and the large majority of couples who will never divorce seriously affect the shape of the overall divorce risk function. Split-population models show that the divorce risk function for couples who will eventually divorce is a linear monotonically increasing line, which is in essence different from the overall divorce risk function. The inverted U-shape overall divorce risk function accurately reflects neither the divorce pattern of couples who will eventually divorce nor the divorce risk of couples who will never divorce. Therefore, the "seven-year itch" reflects the mixed result of divorce risk dynamics for various marriage cohorts undergoing dramatic social, economic, and institutional changes; it is mainly the result of population heterogeneity, i.e., given that only a small number of couples end their marriage in divorce.

The split-population models also reveal that the proportion of Chinese couples who will eventually divorce has increased gradually as time has passed, but the increment is still quite small. These results imply that marriages in China are still very stable. Nevertheless, the slope of the divorce risk function for couples who will eventually divorce has experienced a rapid increase over time, which shows the peak of divorce risk has moved earlier and earlier, and "lightning divorce" has become a social phenomenon that cannot be ignored.

In short, marriage in China is still stable, but noticeable instability has slowly emerged today. Scholars point out that the rapid pace of economic growth and social development since the Economic Reform of 1978 has exerted a profound influence on marriage stability in China. For instance, rapid economic growth and increasing living standards have prompted individuals to have more expectations regarding the quality of married life; at the same time, increasing modernity and increasing openness to public opinion and lifestyles have reshaped people's attitudes towards divorce; moreover, the implementation in 1980 of the "non-fault'" divorce amendment to the Chinese marriage law has made divorce easier than ever before, at least in terms of administrative procedure (Zeng 1995; Ye & Lin 1998).

Yet, existing research has more or less neglected the impact of the declining fertility rate on marriage stability. The strict family planning policy and overall socioeconomic development have led China's fertility rates to continue to decrease since the 1970s. This has meant a decline in couples' joint resources or the decline of specific marriage capital. At the same time, it also means the chance of having a boy is reduced, and the duration of having a younger child in the family is shortened, thereby greatly increasing the possibility that instability will arise in the marriage and the family. To sum up, the causes for the increase of marriage instability in China are complicated. Much work remains in determining how to best integrate all these influential factors from different sources into a theoretical structure.

Endnotes

[1]Based on the design of CFPS, every household must complete one family questionnaire and one family member questionnaire. But due to the problem of nonresponse, the actual number of completed family questionnaires is slightly less than that of the completed family member questionnaires.

[2]Unreasonable values refer to date of divorce or being widowed occurring earlier than the start of the first marriage. The numbers of these two kinds of unreasonable values are six and three, respectively, and thus deleting them does not significantly affect the total sample.

[3]In addition to residential areas, household registration status can also be used to determine urban/rural areas. This study used residential area to distinguish rural from urban for two main reasons. First, migrants from rural to urban areas differ systematically from the left-behind, and their concepts of marriage and childbearing may change because of their urban experiences. Thus, merging them with those who remain in rural areas may not be appropriate. Second, defining urban/rural according to household registration can bring ambiguities in the operationalization because the husband and wife may each have a different household registration status. For couples living in two separate places, especially people who have been divorced, we only have information from the individual answering the questionnaire, which makes it difficult to operationalize. In order to test sensitivity, we also repeated the analysis by using household registration status to distinguish rural from urban and found that the results are consistent.

[4]It seems that merely focusing on the subpopulation of divorced couples and ignoring those who might divorce in the future may cause selection bias. However, this bias did not significantly affect our analysis. If a couple's marriage duration had already exceeded 20 years, we could reasonably assume that, for these couples, the possibility of divorce is very low. For the two cohorts, i.e., those married before 1980 and those who married from 1980 to 1989, those who remained married through the end of 2010 had been married for more than 20 years. For these two cohorts, the analysis also shows that the divorce risk function for the divorced couples is a linearly increasing trend over time. More importantly, our purpose for doing this here is merely to give an intuitive test of the two theories. A formal test will be shown in the results for split-population models. By using the latent class method to divide a population into two groups, we avoid the selection bias that may result from merely relying on whether a couple has divorced.

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Authors' contributions

QZ proposed the idea for testifying "seven-year itch" in China by hiring CFPS 2010 data, instructed the basic analytic framework, and revised the drafts. XQ cleaned the data, participated in the discussion of the analytic framework, operationalized the analytic models, tested the models, drafted the manuscript, and revised the drafts. LJ participated in the discussion of the analytic framework. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

Author details

[1]School of Social and Behavioral Sciences, Nanjing University, Nanjing, China. [2]The Center for Sociological Research and Development Studies of China, Peking University, Beijing, China. [3]Department of Sociology, Peking University, Beijing, China.

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References

Andersson, G. 1997. The impact of children on divorce risks of Swedish women. *European Journal of Population* 13(2): 109–145.

Becker, Gary S., Elizabeth Landes, and Robert T. Michael. 1977. An economic analysis of marital instability. *Journal of Political Economy* 85: 1141–1187.

Davis, D., and S. Harrell. 1993. Introduction: the impact of post-Mao reform on family life. In *Chinese families in the post-Mao era*, ed. D. Davis and S. Harrell, 1–24. Berkeley: University of California Press.

Du, Benfeng. 2008. *Even history analysis and its applications*. Beijing: Economic Science Press.

Durkheim, Emile. 2000. *De la division du travail social*, Trans. Dong Qu. Shanghai: SDX Joint Publishing.

Fei, Xiaotong. 1999. *Reproduction system*. Beijing: The Commercial Press.

Glenn, N.D. 1975. Psychological well-being in the post-parental stage: some evidence from national surveys. *Journal of Marriage and Family* 37(1): 105–110.

Goode, William J. 1986. *Family*, (Translated by Wei ZhangLing). Beijing: Social Science Literature Press.

Guo, Zhigang. 2004. Studies and discussion of the Chinese fertility rate since 1990. *Population Studies* 2: 10–19.

Heaton, Tim B. 1990. Marital stability throughout the child-rearing years. *Demography* 27(1): 55–63.

Institute of Population and Labour Economy. 2010. *Chinese population yearbook 2010*. Beijing: Economic Management Press.

Johnson, D. R., L. K. White, J. N. Edwards, and A. Booth. 1986. Dimensions of Marital Quality: Toward Methodological and Conceptual Refinement. Journal of Family Issues 7(1): 31–49.

Lambert, P.C. 2007. Modeling of the cure fraction in survival studies. *Stata Journal* 7(3): 351–375.

Levinger, G. 1976, A Social Psychological Perspective on Marital Dissolution. Journal of Social Issues 32(1): 21–47.

Li, Jianxin. 2009. *Chinese population structure*. Beijing: Social Science Literature Press.

Lu, Yilong. 2009. Is "marriage of equal social status" more stable?—an empirical analysis of matching structure and marriage risk. *Population Studies* 2: 81–91.

Luckey, E. B. 1966. Number of Years Married as Related to Personality Perception and Marital Satisfaction. Journal of Marriage and Family 28(1): 44–48.

Lyngstad, T.H. 2004. The impact of parents' and spouses' education on divorce rates in Norway. *Demographic Research* 10(5): 121–142.

Morgan, S. Philip, Diane N. Lye, and Gretchen A. Condran. 1988. Sons, daughters, and the risk of marital disruption. *American Journal of Sociology* 94(1): 110–129.

Qiu, Zeqi, and Shiding Liu. 2013. Change in the structure of social sectors. In *Chinese Social Science Internal Manuscripts*, vol. 6.

Rollins, B.C., and R. Galligan. 1978. The developing child and marital satisfaction of parents. In *Child influences on marital and family interaction: a life-span perspective*, ed. R. Lehner and G.B. Spanier. New York: Academic.

Rusbult, C. E., D. J. Johnson, and G. D. Morrow. 1986. Predicting Satisfaction and Commitment in Adult Romantic Involvements: An Assessment of the Generalizability of the Investment Model. Social Psychology Quarterly 49(1): 81–89.

Schoen, Robert. 1975. California divorce rates by age at first marriage and duration of first marriage. *Journal of Marriage and Family* 37: 548–555.

Schmidt, P., and A.D. Witte. 1989. Predicting criminal recidivism using "split population" survival time models. *Journal of Econometrics* 40(1): 141–159.

Thornton, Arland. 1977. Children and marital stability. *Journal of Marriage and Family* 39(3): 531–540.

Vaupel, J.W., and A.I. Yashin. 1985. Heterogeneity's ruses: some surprising effects of selection on population dynamics. *The American Statistician* 39(3): 176–185.

Waite, Linda J., and Lee A. Lillard. 1991. Children and marital disruption. *American Journal of Sociology* 96(4): 930–953.

Wang, Yuesheng. 2006. Analysis on the changes of family structure in contemporary China. *Chinese Social Science* 1: 96–108.

Whyte, M.K., and William Parish. 1984. *Urban life in contemporary China*. Chicago: University of Chicago Press.

Whyte, Martin K. 2005. Continuity and change in urban Chinese family life. *The China Journal* 53: 9–33.

Wu, Deqing. 1999. *Divorce in contemporary China*. Beijing: Cultural Relic Press.

Xu, Anqi. 2012. The influential mechanism of divorce risk—a model for comprehensive interpretation. *Sociology Studies* 2: 109–125.

Xu, Anqi, and Wenzheng Ye. 1998. Marriage quality: metrics and factors. *Chinese Social Science* 1: 145–159.

Xu, Anqi, and Wenzheng Ye. 2001. The impact of divorce on children and its constraints—a survey from Shanghai. *Chinese Social Science* 6: 137–149.
Xu, Qi, Jianning Yu, and Qiu Zeqi. 2013. The influence of children on divorce risk. *Sociological Studies* 4: 26–48.
Yan, Yunxiang. 2006. *The reform of private life: love, family and intimacy in a Chinese village 1949–1999*. Shanghai: Shanghai Bookstore Press.
Ye, Wenzheng, and Qingguo Lin. 1998. Trend of divorce rate and its cause in contemporary China. *Population and Economy* 3: 22–38.
Zeng, Yi. 1995. *Studies on divorce in China's 1980s*. Beijing: Peking University Press.
Zeng, Yi, and Zhenglian Wang. 2004. Changes in Chinese family and the living arrangements of older persons. *Population Studies* 6: 4–10.
Zhang, Minjei. 1997. China's current state of divorce affairs. *Population Studies* 6: 26–31.
Zhang, Qian Forrest. 2004. Economic transition and new patterns of parent-adult child coresidence in urban China. *Journal of Marriage and Family* 66(5): 1231–1245.