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ORIGINAL ARTICLE

Different pathways of the second demographic transition in four East Asian societies: evidence from the 2006 and 2016 East Asian Social Surveys

Weiwen Lai[1] · **Jing Song**[2,3]

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Abstract

This study uses the 2006 and 2016 East Asian Social Surveys to map value changes related to the second demographic transition in mainland China, Japan, South Korea, and Taiwan. The study examines trends in attitudes towards cohabitation, childrearing, and divorce over a 10-year period in the four East Asian societies. The findings suggest that the second demographic transition, if any in East Asia, is an uneven process between societies, and mainland China stands out as the only society in which attitudes had become more conservative, even after controlling for compositional differences in population. In the other three societies, attitudes had shifted to be more liberal. Moreover, the study finds little evidence on the diffusion within societies, given their similar trends across different sociodemographic groups. From an ideational perspective, mainland China and the other three East Asian societies illustrated different patterns of attitude changes regarding marriage and family. From a behavioral perspective, trends in attitudes do not always align with demographic patterns at the macro level, especially in mainland China. More studies are needed to understand the nuanced differences in ideational shifts between societies and the relationship between ideational and behavioral changes in East Asia.

Keywords The second demographic transition · East Asia · Value change · Diffusion · Marriage and family

✉ Weiwen Lai
weiwen.lai@sociology.su.se

[1] Department of Sociology, Stockholm University, Stockholm, Sweden

[2] Gender Studies Programme, The Chinese University of Hong Kong, Hong Kong S.A.R., China

[3] Shenzhen Research Institute, The Chinese University of Hong Kong, Shenzhen, China

1 Introduction

It has been under debate whether East Asia has been experiencing the second demographic transition (referred to as SDT hereinafter), which is argued by scholars to be a spatial diffusion process from place to place (Atoh et al., 2004; Lesthaeghe, 2010, 2020; Raymo et al., 2015; Yu & Xie, 2019). Over the past few decades, demographic and family trends in several East Asian societies seem to support the view that the SDT have spread to this region. Mainland China, Japan, South Korea, and Taiwan have shown trends in the declining fertility rates, the postponed marriage and childbearing, and the increases in cohabitation and divorce. While these changes are in line with expectations of the SDT, some essential elements of the transition are missing. For example, cohabitation is generally short-lived, and childrearing within cohabitation or outside marriage is extremely rare, reflecting the close relationship between the marriage institution and childrearing.

At the outset, SDT was a developed as a conceptual framework to explain new demographic developments of below-replacement fertility and other related changing family patterns in post-industrial societies. The first demographic transition theory posits that, at the end of the transition, a new equilibrium of stationary population is expected with replacement fertility in the absence of population migration. However, the emergence of long-term below-replacement fertility in European countries clearly challenged this view (van de Kaa, 1987). It was difficult to understand why fertility would drop below replacement level according to classic explanations of demographic transition. In this context, SDT was put forward to explain these new demographic developments. Different from economic and structural explanations, the SDT emphasized the central role of value changes, including the shifting attitudes towards marriage and family (Zaidi & Morgan, 2017).

Nevertheless, the literature is contentious on whether the SDT can be as universal as the first demographic transition. A line of this discussion focuses on whether East Asian societies have experienced value changes associated with the SDT, such as the increasing acceptance of the new ways of forming partnership and family. Although previous studies have documented changes in marriage and family patterns in this non-Western context (Chen & Li, 2014; Raymo et al., 2015), the changes can be driven more by other structural factors than value changes. It is to be examined whether the SDT-related value changes have spread to East Asia, driving family changes in the region (Lesthaeghe, 2010, 2020).

This study is not the first one to examine trends in individuals' attitudes towards marriage and family in East Asian societies (e.g., to see Atoh, 2007 for Japan; Na & Cha, 2014 for Korea; Yeung & Shu, 2016 for mainland China), but most existing studies focus on one single context without a comparative scope. This is probably due to the lack of harmonized data by which attitudes can be compared between different points in time and between different societies at the same time. Till now, we have a limited understanding of whether the SDT has spread to East Asia and whether there have been differences in this demographic development across societies.

This study aims to address this gap primarily by using data from the 2006 and 2016 East Asian Social Surveys (EASS) to examine trends in three attitudes towards cohabitation, childrearing, and divorce, respectively. This study geographically covers mainland China, Japan, South Korea, and Taiwan, and compares trends in individuals' attitudes in the four societies. There are two descriptive goals of the study. The first goal is to describe different trends in the three attitudes across societies. The second goal is to describe different trends by key sociodemographic variables within each society. In addition, we also compare trends in attitudes with macro-level trends in sociodemographic developments. Through examining value changes, we aim to compare the development of SDT between and within the four East Asian societies.

2 The second demographic transition and its diffusion

The SDT has been proposed to explain the below-replacement fertility and changing marriage and family patterns that first unfolded in a few highly developed European countries since the 1960s. Despite the scholarly debates around the SDT (Coleman, 2004; Zaidi & Morgan, 2017), it is clear to students of demography that the role of value change is of utmost importance in the theoretical building of the SDT, which has also acknowledged the influence of structural and institutional factors (Lesthaeghe, 2010; van de Kaa, 1987). In short, the SDT postulates that a shift from material needs to non-materials ones will occur among individuals when society advances to be more developed, affluent, and secular (Inglehart, 1990). This societal development leads to ideational change towards individualist values such as personal autonomy, freedom of choice, and self-realization.

These shifting value orientations give rise to changes in several aspects of demographic behavior, which are related to each other (van de Kaa, 1987). In northwestern European countries, which are often considered the forerunner of the SDT, partnership and family processes have become more diverse and complex over the life course. Cohabitation, a landmark feature of the SDT, has gradually replaced marriage as the preferred choice of young people's first union experiences. With the decoupling of marriage and childrearing, cohabitation has become an increasingly popular setting where children are raised (Thomson, 2014). It is not surprising to observe that partnership has become more unstable partly because an increasing share of couples are staying in cohabitation, which is generally less committed than marriage. Even among married couples, divorce rates are also on the rise (Kiernan, 2004). It is not uncommon that divorcees prefer cohabitation over marriage for subsequent partnership (Perelli-Harris et al., 2017), further contributing to union instability.

Another defining SDT feature is the below-replacement fertility levels. During this demographic development, there is a shift in the parent–child relationship from "king-child with parents" to "king-pair with a child" (van de Kaa, 1987). Children, which once had a central role in couple relationships, become one of the fulfilling life events among many others for young people in search of self-realization. When childbearing clashes with the goals of completing education and career development

in early adulthood, young people tend to forego parenthood at this life stage. The inconsistency between parenthood and other life goals is particularly salient for females, who often assume disproportional childcare responsibilities. With the widespread of contraceptive technology, parenthood has been increasingly postponed and even abandoned by some. The postponement of parenthood indicates a shortened reproductive span. The overall outcome at the population level is below-replacement fertility (less than 2.1 children per woman), which is thought to be a long-lasting demographic feature of the populations experiencing the SDT.

An aspect of the debates on the SDT is whether this demographic transition is an idiosyncratic phenomenon limited to developed European countries and a few developed countries outside Europe (Lesthaeghe, 2010; Sobotka, 2008). Some scholars argue that the SDT is a spatial diffusion process between geographic units across and within countries (Doignon et al., 2020; Vitali et al., 2015). This view is tied to the assumption that values are socially contagious, such that people's attitudes can shape and be shaped by others, especially with the aid of social media that connects people in an unprecedented manner. If value change is the fundamental underpinning of the SDT, the transition in one place will spread to new places where similar ideational shifts also occur. As mentioned above, the SDT is often thought to first develop in a few highly developed and secular countries in northwestern Europe and have later spread to other parts of Europe and possibly some developed countries in other continents (Lesthaeghe & Neidert, 2006; Liefbroer & Fokkema, 2008; Sobotka, 2008). However, opinions differ on whether the SDT can take place in non-Western contexts. For example, discussions have just touched upon whether the SDT is developing in East Asian countries, which often have a different culture system than the one shared by the West. More exactly, the culture of familism is rooted and individualism was traditionally discouraged in East Asian cultures (Chen & Li, 2014; Lesthaeghe, 2010, 2020; Raymo et al., 2015). Moreover, the notion that secularization is an impetus for the SDT seems dubious in East Asia. Traditionally, the church was hardly an important or powerful actor in individuals' private life in East Asia, whose societies were not religious, at least not in the same way as Western contexts.

The diffusion of the SDT can also be understood as a micro process. Within a population, innovative ideas of demographic behavior can diffuse unevenly, with groups with particular sociodemographic characteristics first embracing new ideas of partnership and family and leading trends of family change. Over time, new ideas and behavior will spread to other groups of the population. The literature has suggested a few sociodemographic characteristics central to the micro diffusion process of the SDT. Education is shown to be an important avenue for value transformation towards more liberal or progressionist ones, including those surrounding marriage and family (Lesthaeghe, 2010). Better educated people are often the forerunner of the SDT because they tend to disapprove of traditional and religious beliefs and espouse post-materialist values related to the transition (Dotti Sani et al., 2022; Sobotka, 2008; Surkyn & Lesthaeghe, 2004). Age can have a role to play. Younger groups' worldviews are more malleable; due to greater exposure to social media and peer interaction, young people are susceptible to inflowed new ideas and knowledge. A large body of studies has consistently shown that age is related to positive attitudes

towards cohabitation and childlessness, which are typical SDT behavior. Urban residency can also be a candidate for driving people's value changes. Evidence has shown that, at the macro level, the SDT tends to first develop in places with higher levels of urbanization (Lesthaeghe, 2010; Valkonen et al., 2008). Because secularization and de-traditionalization are often a product of urbanization, urban population is more likely to view positively or practice alternative forms of partnership and faces less social pressure from doing it (Sobotka, 2008; Yu & Xie, 2015).

3 Four East Asian societies from a comparative perspective

Mainland China, Japan, South Korea, and Taiwan have many similarities in their marriage and family institutions partly because of the shared cultural roots of what scholars argue to be Confucianism. Chen and Li (2014) argue that these four societies share the familism that can be similarly characterized by structures of power hierarchy and solidarity between family members. More specifically, this familism emphasizes father-son relations in the extended family; children's submission to parental authority; intergenerational support and solidarity; and intrafamily social interaction and exchange (Yang, 1988). Values and norms related to marriage and family under this familism often prioritize collectivist interests such as those of family and community. For example, traditionally, children's decisions on marriage formation required parents' approval (Whyte, 2020; Xu & Whyte, 1990). Even nowadays parents are still involved their children's decision-making of significant life course events, such as marriage and childrearing. The familism in these East Asian societies is apparently different from the individualism-oriented worldviews that are thought to underline the SDT. Partly as a result of the shared familism, the four societies historically had similar demographic profiles, including high fertility rates, universal and early marriage, and rare incidents of divorce, cohabitation, and childrearing outside marriage (Raymo et al., 2015).

The four societies also have similar cultural scripts of defining gender roles inside and outside the family (Fan & Qian, 2022), an important aspect of understanding the family change in East Asia. The meanings attached to non-conventional sexual and family behavior, such as non-marital sex, cohabitation, and divorce, differ by gender (Parish et al., 2007; Song & Lai, 2021), with more social stigma tied to females who experience such behavior than their male counterparts. Upon entry into marriage, the division of labor in the family is highly gendered (Qian & Sayer, 2016). These societies' married females assume the lion's share of household and childcare responsibilities, although they have contributed increasingly more to the family economically (Bumpass et al., 2009). While East Asian females have played a more important role in the labor market and other public spheres, their male peers seem to change little in their involvement in activities in the domestic realm. Females have been expected to be the primary care provider for the family and children. The unequal gender relations in the family and the severe work-family conflicts faced by females shape their choices of marriage and family formation (Brinton & Oh, 2019; Kan et al., 2019).

In addition, the four societies' developmental pathways are similar. Mainland China, South Korea, and Taiwan underwent what has been called the "compressed modernity." This describes that these societies' economies became industrialized quickly within a few decades, though they differed in the timing of the process (Ochiai, 2011). Japan, the case of "semi-compressed modernity" (Ochiai, 2014a), underwent a longer process of industrialization, but it was still much shorter than that of Western countries. Economic development in these East Asian societies also gave rise to important structural changes, including prolonged formal education and improving education as well as employment opportunities, particularly for females (Raymo et al., 2015). The process of economic development was so rapid and condensed that institutional and political change was often limited or lagged (Ochiai, 2014b). The pursuit of economic development has been at the core of social policies for these East Asian governments, which can be reflected by the governments' heavy investment in education and healthcare of their labor forces (Aspalter, 2006). Rather than the state, the family has an important role to play in facilitating welfare provisions and is responsible for the well-being of its members. Family-related policies in these societies, such as parental leave, is weak in either scope or strength, and some of the policies are based on gender essentialist assumptions such as the breadwinner-homemaker family model (Chung et al., 2021). That said, it is important to mention the divergence in the development of welfare regime between societies. While the Chinese welfare regime has become more individualist and market-based, Japan, South Korea, and Taiwan have gradually expanded their welfare provisions to be more inclusive and extensive, aiming at socializing family responsibilities and promoting gender equality (Peng & Wong, 2010).

From a demographic point of view, the four East Asian societies have all exhibited signs of family change that are in line with the SDT, leading to the growing debate on whether the transition has been developing in these societies. Period total fertility rates, which once remained high in this region, have declined to below-replacement level. Japan has the longest record of below replacement fertility in the world; all the four societies have sustained below-replacement fertility since 1995 (Raymo et al., 2015); ultra-low fertility (less than one child per woman) emerged in South Korea and Taiwan in 2018 (Cheng 2020); and over the past few years, the world's lowest fertility rates were repeatedly recorded in societies of this region. Refined fertility measures indicate that a considerable portion of births are more likely to be foregone rather than postponed, driving the strikingly low fertility (Frejka et al., 2010). The increase in pre-marital cohabitation is striking in some of the East Asian societies. Despite the increasing prevalence of cohabitation, cohabiting unions in East Asian societies are far from achieving the important status in partnership progression (legally and culturally) as they are in the West. Instead, cohabitation in East Asia is short-lived and, in most cases, better understood as a prelude to marriage (Raymo et al., 2015). While childrearing within cohabitation or outside marriage is extremely limited, cohabitation is becoming a more common setting where pregnancy occurs (Qian & Jin, 2020; Raymo et al., 2009). Most cohabiting couples with a conceived child marry soon before the birth. When people marry later and as childrearing is still closely tied to marriage, mean ages at first marriage

and first parenthood increase concurrently. Marriage has also become more unstable over time, as indicated by the increase in crude divorce rates over the past recent decades to a level comparable to, if not higher than, most Western countries (Davis & Friedman, 2014; Jones, 2015; Raymo et al., 2015).

Despite similarities in various aspects, remarkable differences in demographic behavior exist between the four societies. In fact, they have more differences than similarities with in-depth comparisons. Japan is often taken as an example of the spread of the SDT into a non-Western context. Nearly all of its demographic developments fit into this transition framework except the absence of out-of-wedlock childrearing (Lesthaeghe, 2010). Chinese people's mean ages at first marriage formation and at first parenthood were earlier than the other three East Asian societies by around five years in 2010 (Raymo et al., 2015). Young peoples' experiences of pre-marital cohabitation seem to be more prevalent in mainland China and Japan than South Korea and Taiwan. In both mainland China and Japan, about one-fourth of the individuals born around 1980 had cohabitation experiences before marriage, but the mean duration of cohabitation was longer in Japan than mainland China (Raymo et al., 2009; Yu & Xie, 2015). For South Korea, no reliable statistics about the prevalence of pre-marital cohabitation can be found, and scholars suggest that social stigma is attached to cohabitation due to moral concerns about female virginity and the society's conservative attitudes towards family matters generally (Cheng, 2020; Park, 2021).

More revealing is how these societies differ in their sociodemographic and policy underpinnings of emerging new demographic patterns. While cohabitation is more popular among people with less education in Japan and Taiwan (Cheng, 2014; Raymo & Iwasawa, 2008), the reversed pattern is observed in mainland China with a clear positive education gradient of cohabitation among older cohorts (Yu & Xie, 2015). For mainland China, although this evidence was taken as a sign of the developing SDT (Lesthaeghe, 2020), however, among the more recent birth cohorts after the 1990s, the positive educational gradient disappears, and, for these cohorts, the percentage of the Chinese with pre-marital cohabitation experiences is larger among people with primary school education than those with college degrees (Yu, 2021). The selection into divorce differs by society. Divorcees in mainland China are not negatively selected on education (Xu et al., 2013), and this contrasts with the clear negative educational gradient of divorce in Japan, South Korea, and Taiwan (Raymo et al., 2015). It is a more controversial issue what has been actually driving mainland China's fertility decline (Cai & Wang, 2021). While the decades-long one-child policy can easily be considered a candidate responsible for forcefully lowering fertility rates, studies have pointed out that economic development rather than the policy should be a more important reason (Cai, 2010). Against this socio-legal context in mainland China, it is not clear whether the decrease in fertility desire arises from the individuals' pursuit of higher-order needs along Maslow's hierarchy, or from the socialization of the one-child family norm as a consequence of being the only child in the family during childhood. In contrast, Taiwan and Japan have been promoting a cultural ideal of the two-child family when their population began to age around the 1960s. Despite so, both the societies experienced

decreases in fertility rates, and the stated preferred family size also decreased in Japan (Fukuda & Saotome, 2018).

4 Data and methods

The study utilizes the 2006 and 2016 the East Asia Social Surveys. With a cross-sectional research design, the EASS is a biennial social survey project that geographically covers four East Asian societies including mainland China, Japan, South Korea, and Taiwan. The survey has rotating topical modules of questionnaires. Because both the 2006 and 2016 surveys have a common module about family and marriage, this provides a unique opportunity to compare attitudes over a 10-year period and across the four societies. The 2006 survey was fielded in the second half of 2006, and response rates, which differ by society, varied from 38.5 to 65.7%; the period when the 2016 survey of the survey was fielded differed by society: mainland China in 2017, Japan in 2017–18, South Korea in 2016, and Taiwan in 2016. The response rates of this survey varied from 46.9 to 68.9% (for more details of the survey, see the EASS project website: https://www.eassda.org/index.php).[1] It is worth mentioning that the one-child policy had been replaced by a universal two-children policy by the time when the 2016 survey was fielded in mainland China. The study population is those aged 20 to 69. After excluding cases with missing values, the sample size of mainland China, Japan, South Korea, and Taiwan is 3310, 1718, 1424, and 1816 respectively in the 2006 survey, and is 3362, 2001, 844, and 1705 respectively in the 2016 survey.

As we examine trends in attitudes around marriage and family, we use three dependent variables that measure the attitudes towards cohabitation, childrearing, and divorce, respectively. The three dependent variables are constructed from the questions "It is all right for a couple to live together without intending to get married," "It is not necessary to have children in marriage," and "Divorce is usually the best solution when a couple can't seem to work out their marriage." The three questions were asked in the same way in both the 2006 and 2016 surveys, with a 7-point Likert scale, in which "1" for "Strongly agree," "2" for "Fairly agree," "3" for "Somewhat agree," "4" for "Neither agree nor disagree," 5 for "Somewhat disagree," "6" for "Fairly disagree," and "7" for "Strongly disagree." We have reversed the scale for ease of interpretation. The analysis examines trends in attitudes in two ways. First, we compare the mean values of the three attitudes between the 2006 and 2016 surveys. After the transformation, a higher mean value indicates a higher level of acceptance of non-traditional attitudes towards marriage and family. Second, aside from mean values, which can be possibly distorted by a skewed distribution, we compare changes in different response categories of the attitudes over time. For simplicity of the analysis, we collapse categories "Fairly disagree" and "Somewhat

[1] We tried to fit models using the sample after weighting to adjust non-response bias. The results about trends in attitudes and model results are similar to those to be presented in the following result section (results not shown, available upon request).

disagree" and categories "Fairly agree" and "Somewhat agree." For the attitude towards childrearing (or fertility desire in general), ideal family size is an arguably better indicator, which is commonly used in the literature. However, information on ideal family size is only available in the 2006 survey but not in the 2016 survey.

This study also examines on trends in attitudes by key sociodemographic variables to examine the development of the SDT within societies. We include sex, education, age, and urban residency. Education is defined as a categorical variable with three levels (Lower secondary or below; Upper secondary or post-secondary; College). Age is split into 10-year intervals from 20 to 69. Urban residency is a binary variable to measure whether respondents are living in large cities. This variable is constructed by the survey question which asked respondents to assess the characteristic of the community where they lived. In the 2016 survey, options include "A big city," "The suburbs or outskirts of a big city," "A town or a small city," "A country village," and "A farm or home in the country." We code those choosing "A big city" as "1" and other options as "0". In the 2006 survey, options for this question differed between the four societies. For each society, we code as "1" those living in the place with the highest level of urbanization and other options as "0". In this survey, respondents coded as "1" in this variable are those choosing "Cities with population above 4,000,000" in mainland China, choosing "Largest cities" in Japan, choosing "1,000,001 and more: Metropolitan city" in South Korea, and choosing "Large cities" in Taiwan. Given the differences in options, it is important to notice that the variable of urban residency is not entirely comparable between the two surveys.

In the result section below, we first present the summary statistics of sociodemographic variables by survey year and society. The following analysis presents and discusses trends in attitudes between societies as well as trends in attitudes by sociodemographic variables within societies. We then move to present the results of society-specific OLS models that regress the three dependent variables on a dummy variable of survey year and the sociodemographic variables mentioned above. The multivariate analysis is to examine whether trends in attitudes arise mainly from the difference in population compositions between 2006 and 2016. At the end of the analysis, we compare trends in attitudes with trends in macro-level indicators of socioeconomic development including annual GDP growth, gross enrolment of college, and female to male ratio of labor force participation, as well as macro-level indicators of demographic behavior such as period total fertility rate, mean age at first marriage for males and females, and crude divorce rate for the four East Asian societies in the same period. This comparison between individuals' attitudes with macro-level indicators provides further insights into the relationship between value changes and family changes in East Asia.

5 Results

5.1 Sample characteristics

Table 1 shows the distribution of sociodemographic variables by survey year and society. The mean and standard deviation of a continuous variable of age are also

Table 1 Sociodemographic characteristics of the sample by year and society

	2006				2016			
	Mainland China	Japan	South Korea	Taiwan	Mainland China	Japan	South Korea	Taiwan
Female (%)	55	55.2	55.1	50.1	54.6	52.8	52.5	49
Age (mean (SD))	42.91 (12.93)	47.77 (13.92)	41.11 (12.27)	41.93 (13.36)	47.06 (13.80)	47.83 (13.63)	43.86 (14.11)	43.20 (13.83)
Age (%)								
20–29	18.5	12.9	19.7	23	14	11.3	21.2	20.5
30–39	24.4	18.8	27.3	22	18.1	17.5	20.5	22.6
40–49	23.6	18.5	29.2	24.3	20.2	24.6	20.1	21.3
50–59	20.9	24.6	13.6	19.2	23.4	21.3	20.9	19.9
60–69	12.6	25.2	10.1	11.5	24.4	25.2	17.3	15.7
Education (%)								
Lower secondary or below	62.5	12.9	18	35.1	58.9	5.8	12.8	21.2
Upper secondary or post-secondary	32.7	65.7	52.8	44.4	28.2	65.3	40.4	38.9
College	4.7	21.4	29.2	20.5	12.9	28.9	46.8	39.8
Living in a large city = Yes (%)	19.1	20.2	50.5	39.6	49.9	19.6	57.6	55.7
N	3110	1718	1424	1816	3362	2001	844	1705

The 2006 and 2016 EASS; authors' own calculations

included in the table as additional information. From Table 1, the percentage of females is slightly higher than males in all the four societies except Taiwan in 2016. The four societies had all aged over time to varying degrees, and mainland China had the largest increase of about 4.1 years. Japan was the oldest society in both surveys. The four societies had become more educated over the 10 year period, as indicated by the increase in the share of college-educated respondents. South Korea had the highest percentage of respondents with college degrees in both surveys among the four societies. Nearly half of the South Korean respondents in the 2016 survey had college degrees. Compared with the other three societies, mainland China was still less educated, although the gap was closing. In both surveys, relative to its neighbors, mainland China still had a much larger proportion of respondents with lower secondary or below education, and its share of college-educated respondents was also noticeably smaller. Each of the four societies had an increase in the share of its residents who lived in large cities except Japan, which had a slight decrease. The decrease is possibly due to the inconsistent measures in the surveys mentioned above.

5.2 Trends in attitudes by society

Figure 1 shows the trends in the mean values of the three attitudes towards cohabitation, childrearing, and divorce from 2006 to 2016 in the four societies; Fig. 2 shows the trends in the distribution of different categories of the same variables, and in this figure, while colors represent response categories, bars are also differentiated by their transparency, with more and less transparent bars representing year 2006 and

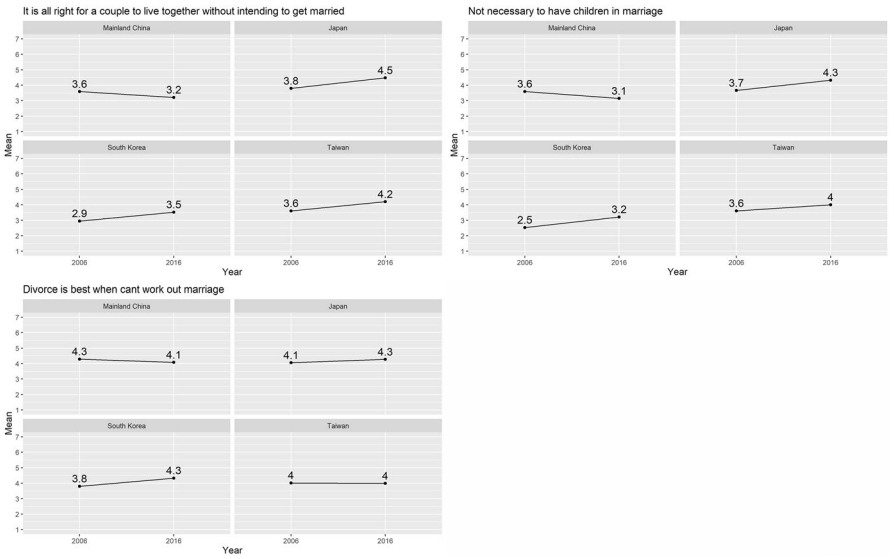

Fig. 1 Trends in attitudes from 2006 to 2016 by society

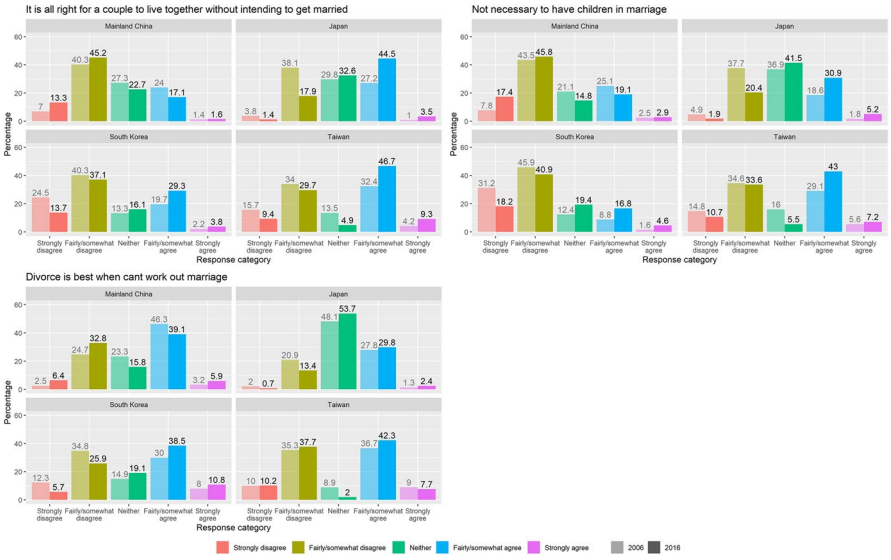

Fig. 2 Trends in attitudes by response category from 2006 to 2016 by society

2016 respectively. Figure 1 shows a clear pattern that while Japan, South Korea, and Taiwan show an increase in the mean value for each of the three attitudes, a reversed pattern of decreasing trends is observed in mainland China. Over the study period, mainland China had become more conservative as to how the Chinese viewed such attitudes related to marriage and family. On the contrary, the other three societies had become more liberal in the same ideational aspects. In 2006, South Korea had the most conservative attitudes, as evidenced by the lowest mean for all the three attitudes among the four societies. However, with its conservative trends, mainland China replaced South Korea to become the one with the most conservative attitudes in 2016. Japan was the most liberal society in each of the three attitudes in both 2006 and 2016. Taiwan, which was similar to Japan, also appeared to be more liberal than mainland China and South Korea in these attitudes. Furthermore, trends in attitudes are not driven by overwhelming increases or decreases in groups with particular attitudes. Figure 2 shows that mainland China's conservative trends in the three attitudes arose from both increases in respondents choosing "Strongly disagree" and "Fairly/somewhat disagree" as well as decreases in "Strongly agree" and "Fairly/somewhat agree." In comparison, the other three societies had seen higher shares of "Strongly agree" and "Fairly/somewhat agree" and lower shares of "Strongly disagree" and "Fairly/somewhat disagree" in the attitudes towards cohabitation and childrearing.

Looking at trends by attitude, Fig. 1 shows that the trends in the attitudes towards cohabitation and childrearing are more pronounced than the one towards divorce. The four societies' attitudes towards divorce had remained basically intact over time except the one of South Korea, with a 0.5-point increase. The liberal shift in the attitude towards divorce in South Korea seems surprising given

that the other three societies experienced minor shifts in this attitude. Also, in South Korea, trends in the three attitudes are similar, with an increase of around half point. In comparison, in Japan and Taiwan, the increasing trends in the attitudes towards cohabitation and childrearing are stronger than divorce. In mainland China, where decreasing trends in attitudes are observed, the decrease in the attitude towards divorce is also less salient compared with the other two attitudes. However, Fig. 1 only shows part of the story about trends in the attitude towards divorce. The distribution of different categories shown in Fig. 2 provides further insights about the seeming stability of such trends. For example, this attitude had actually become more polarized in Taiwan, where the percentages of the Taiwanese respondents who held "Fairly/somewhat agree" and "Fairly/somewhat disagree" both increased; there was also a slight increase in the Chinese respondents indicating "Strongly agree" in the attitude towards divorce (3.2 to 5.9%).

The last point to make by Fig. 1 is that the absolute values of attitudes' means are considerably small, varying from 2.5 to 4.3 and from 3.1 to 4.5 in 2006 and 2016 respectively. Recalling that these attitudes were measured on a transformed 7-point Likert scale, the option with a value of 4 indicates a neutral attitude. Therefore, most of the mean values only indicate slightly more positive attitudes than neutral ones. Figure 2 also shows similar findings. The percentage of "Strongly agree" for the attitude towards cohabitation was less than four in 2016 in all the four societies except Taiwan, which had a slightly higher value of close to 10 percent. However, there are considerable variations between societies. For example, if combining options "Strongly agree" and "Fairly/somewhat agree," around half of the respondents in both South Korea and Taiwan held positive attitudes towards cohabitation in the 2016 survey. In comparison, the corresponding percentage in mainland China was much lower, with a value lower than 30 percent.

5.3 Trends in attitudes by sociodemographic variables

To further investigate whether values associated with the SDT diffuse within societies, we further stratified society-specific trends shown in Fig. 1 by a set of sociodemographic variables central to the SDT, including sex, education, age, and urban residency. The results are shown in Figs. 6, 7, 8, 9 (shown in the Appendix). If the SDT diffuses within societies, we expect that forerunner groups (such as the highly educated) in the transition have more salient trends than later-comer groups. However, the results about trends by key sociodemographic variables are largely not in line with the expectation. Instead, we find that the trends do not differ by sex, education, age, or urban residency in both the societies with increasing trends (Japan, South Korea, and Taiwan) and the society with decreasing trends (mainland China). That said, some important exceptions are observed. For example, the attitudes towards cohabitation and childrearing among Chinese respondents with college education had change little compared with the overall conservative trends in the society; also, there is a negative educational gradient of the trends in the attitude towards

divorce in Taiwan, with the least and most educated groups becoming more liberal and more conservative respectively (for a brief interpretation of trends by sociodemographic variables, see the online supplementary document of the article).

5.4 Adjusting for compositional differences

As shown in Table 1, each of the four societies differ in sociodemographic characteristics between 2006 and 2016. They had all become older, more educated, and more urbanized over the 10 year period. Although the purpose of this study is to descriptively map out trends in attitudes, we have fitted OLS models that regress the attitudes on a dummy variable of survey year (2016 versus 2006) and the sociodemographic variables examined above. Models are fitted using society-specific samples.

The multivariate analysis is to examine whether the pattern of trends hold after adjusting for compositional differences. For each attitude, two OLS models are fitted. While the first model only includes a survey year dummy, which is equivalent to the bivariate analysis in Fig. 1, the second model controls for the sociodemographic variables. We have plotted the unadjusted and adjusted coefficients of survey year from the two models to examine whether between-population compositional differences can account for the period difference in attitudes. Figure 3 shows the comparison of coefficients from the two nested models by attitude and society. In the figure, while red dots and lines represent unadjusted coefficients (without controls) and their associated 95% confidential intervals, the blue counterparts represent the point and interval estimates of adjusted coefficients (with controls).

Figure 3 has clearly demonstrated that when sociodemographic variables are accounted for, the results do not change substantively. Neither the direction nor significance of the association between the dummy variable of survey year and outcomes changes as a consequence of adjusting for compositional differences. To briefly repeat what we have found, over the 10-year period, only the Chinese had become more conservative in all the three attitudes given its negative coefficients. On the contrary, the same attitudes in Japan, South Korea, and Taiwan had become more liberal.[2] The attitude towards divorce in Taiwan is the only exception that this attitude had not changed over this period, a finding consistent between models with and without controls (see the full model results in Tables 2, 3, 4, in the Appendix and see the online supplementary file for a brief interpretation of other covariates).

[2] Mainland China was far less urbanized than the rest three societies under comparison, and rural areas in mainland China was less developed and different from than the urban counterparts. We tried to also drop rural respondents for the Chinese sample and refitted models. The main results remain the same that the 2016 wave is associated with more conservative attitudes. We also fitted ordered logit models for each society, and this did not change the main finding of the relationship between the survey year dummy and attitudes (results not shown, available upon request).

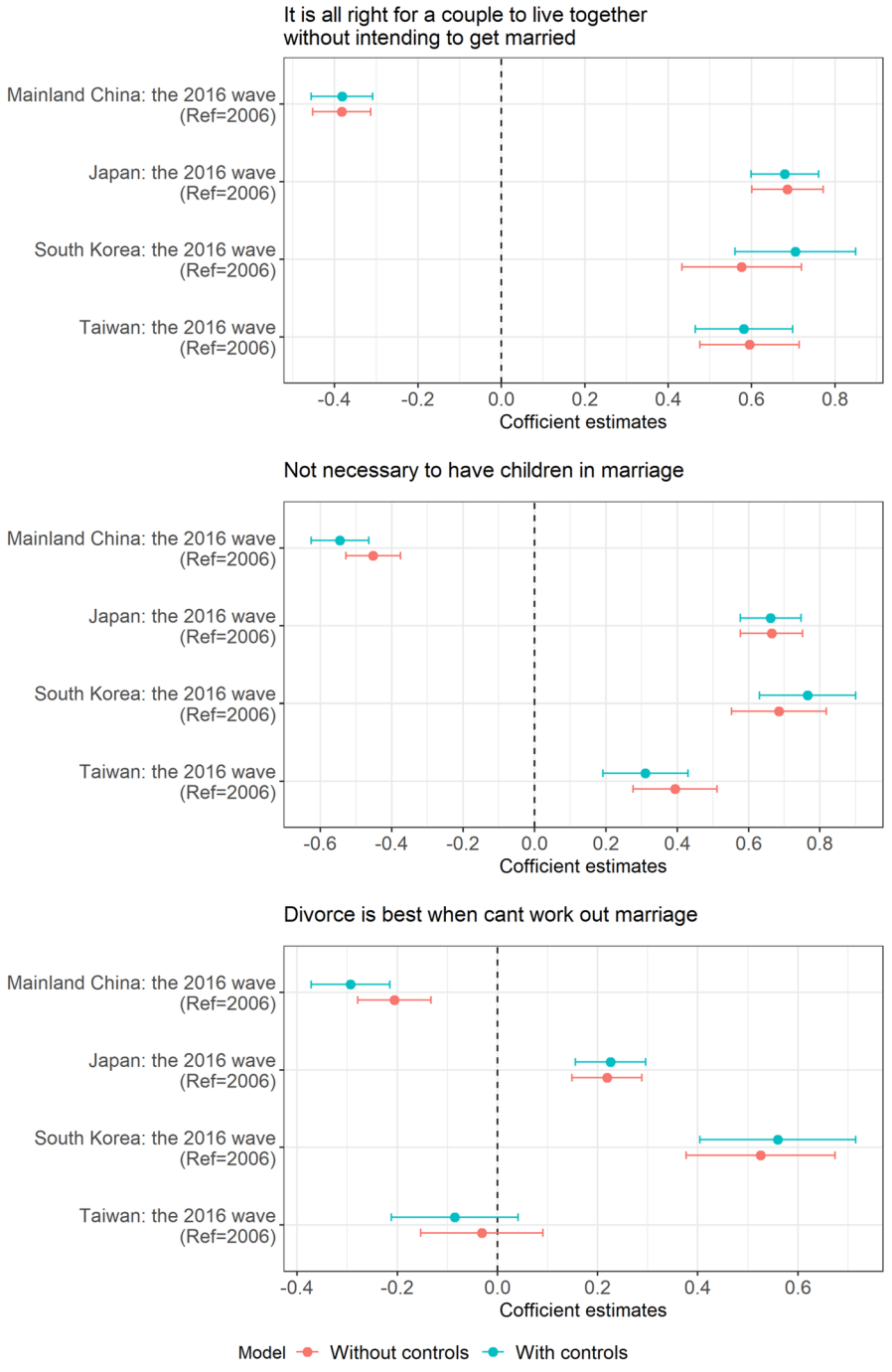

Fig. 3 Comparing coefficients between models with and without sociodemographic controls

5.5 Comparing individuals' attitudes with macro-level indicators

To understand the trends in attitudes and the between-society differences shown in the previous sections, we compare them with macro-level patterns of socioeconomic development as well as demographic behaviors in the four societies during the same period from 2006 to 2016. Figure 4 presents the trends in annual GDP growth, gross enrolment ratio for tertiary education, and gender ratio of labor force participation (female-to-male, aged 15+),[3] which are important correlates of marriage and family dynamics as well as post-materialist values (Inglehart, 1990; Kalmijn, 2007). The figure shows that, despite fluctuations, mainland China, South Korea, and Taiwan had remained positive growth in GDP almost for the whole period, showing no strong sign of economic downturn that might deter marriage and family formation. Japan is different from the other three societies given its negative or zero growth in a few years. Gross enrolment ratio for tertiary education remained stable at a high level over 80 percent in both South Korea and Taiwan. The ratio in Japan (data up to 2013 only) was also stable but with a lower level than that of South Korea or Taiwan. Mainland China's gross enrolment ratio for tertiary education had been increasing but its level was much lower than the other three societies. As the populations in these societies all became more educated, their attitudes were less likely to become more conservative, which, however, is not the case for mainland China. The last panel in Fig. 4 shows an increasing trend in female labor force participation relative to that of male in all the four societies except mainland China, whose level was stable and much higher throughout the whole period. In short, this suggests a possible mismatch between value changes and socioeconomic development patterns.

Figure 5 shows the trends in period total fertility rates and crude divorce rates for the four societies from 2006 to 2016 and mean age at first marriage for males and females in 2005, 2010, and 2015.[4] Period total fertility rates had been well below the replacement level for each of the four societies, with a level lower than 1.5 in this period. Period total fertility rates had been fluctuating in mainland China, South Korea, and Taiwan, but Japan experienced a slight, steady increase. For both sexes alike, the four societies had all gone through an increase in mean age at first marriage except Japan, where mean age at first marriage declined slightly from 2010 to 2015. In comparison, marriage in mainland China was still considerably earlier than the other three places in this period. Given the close

[3] Source: for the three indicators, World Bank Open Data for mainland China, Japan, and South Korean: https://data.worldbank.org/; Data about Taiwan from: https://stats.moe.gov.tw/files/ebook/indicators/14.pdf; partly author's own calculations for the indicator of ratio of female-to-male labor force participation.

[4] Source: trends in total fertility rate from the analysis of Yang et al. (2022) for mainland China and Human fertility database (data assessed on 01 Sept 2022) for the rest three societies; mean age at first marriage of mainland China, South Korea, and Japan from World Bank Open Data for mainland China, Japan, and South Korean: https://data.worldbank.org/, and the corresponding Taiwanese data from https://www.gender.ey.gov.tw/gecdb/Stat_Statistics_Field.aspx; data of crude divorce rate from vital statistic in the respective society: https://www.mca.gov.cn/article/sj/tjgb/ for mainland China, https://www.stat.go.jp/english/data/nenkan/65nenkan/1431-02.html for Japan, http://kostat.go.kr/portal/eng/pressReleases/8/11/index.board for South Korea, and https://www.stat.gov.tw/mp_stat.html for Taiwan.

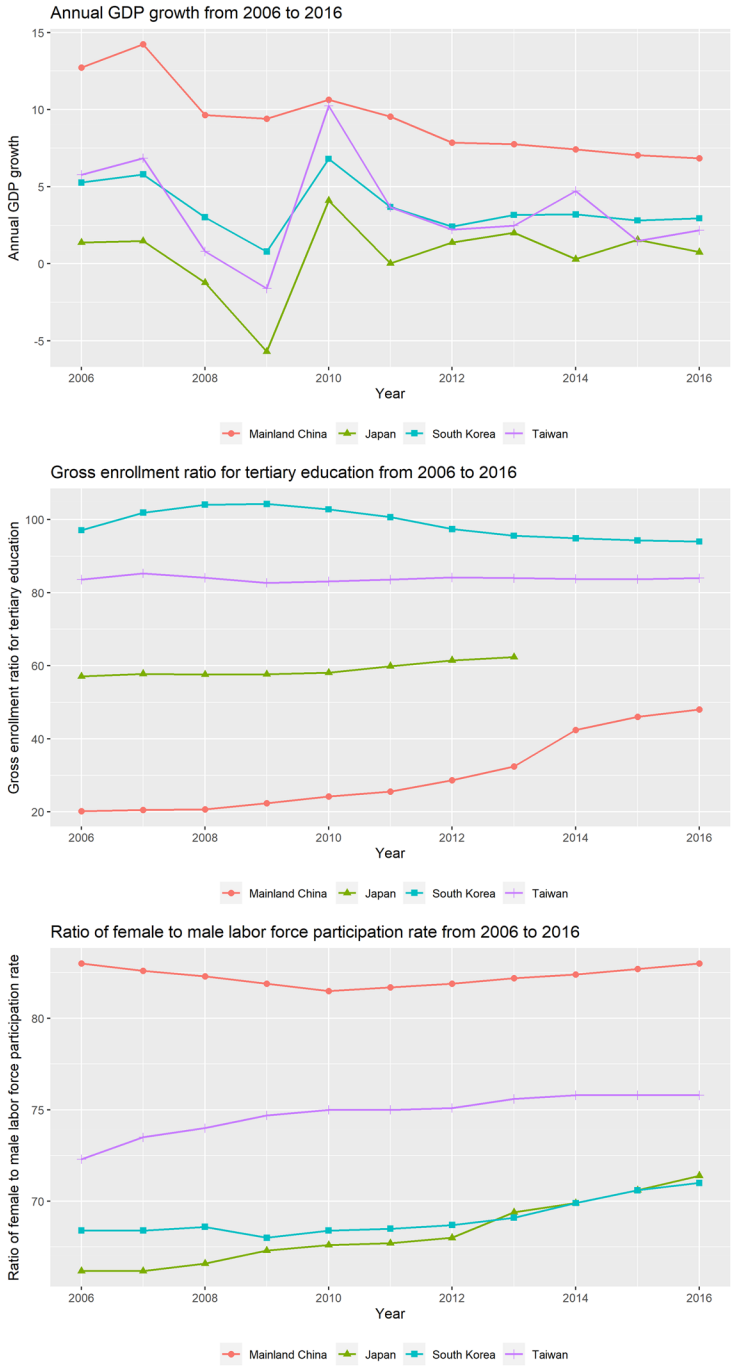

Fig. 4 Trends in macro-level socioeconomic development from 2006 to 2016 by society

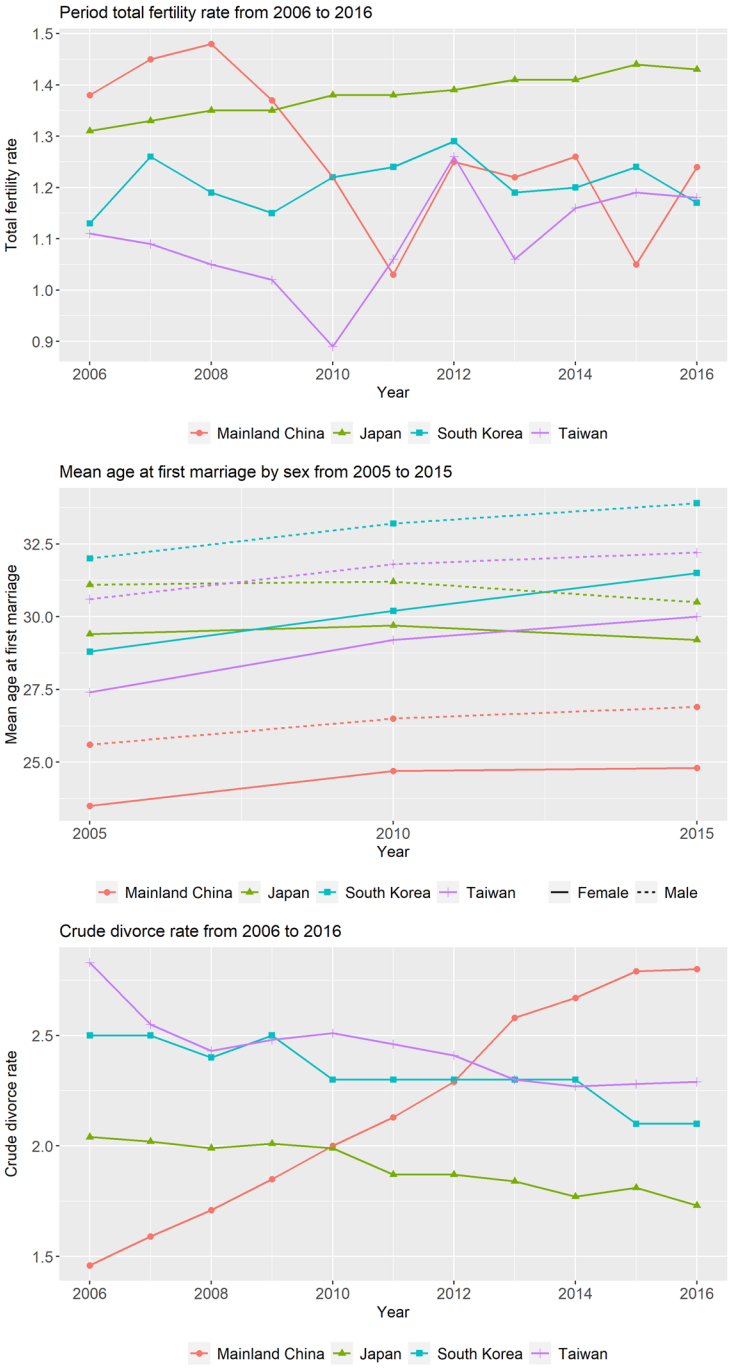

Fig. 5 Trends in macro-level demographic behavior from 2006 to 2016 by society

linkage between marriage and childbearing in the East Asian context (Raymo et al., 2015), it is likely that postponement of first marriage also suggests delay in first births. As young people in these societies marry later, it is possible that they spend a larger proportion of early adulthood in cohabitation. However, due to lack of data on cohabitation, we still have a limited understanding of whether it is the case, especially from a comparative perspective. While Japan, South Korea, and Taiwan had a decreasing trend in crude divorce rates, it is interesting to observe that mainland China again stood in contrast to the other three societies given its increasing trend in this indicator. Mainland China's robust marriage institution and the increasing divorce rates suggest coexisting and sometimes conflicting trends of demographic patterns, which are partly reflected in its different patterns of value changes.

The comparison of macro-level indicators and demographic behaviors neither aligns with nor explains the contrast in attitudes between mainland China and the other three societies. It seems that mainland China does not systematically differ from the other three societies in demographic behaviors at the societal level. Instead, the four societies had seen changes in marriage and family patterns in align with the SDT, such as below-replacement fertility and postponement of first marriage and childbearing. Although being more conservative in their attitudes towards divorce, Chinese individuals' marriage became more unstable. Moreover, when linking individuals' attitudes with macro-level indicators, on the surface, the differences in socioeconomic development at the societal level do not account for the observed different pattern of changing attitudes between mainland China and the other three societies. In this period, mainland China is the one with strong economic growth, an increasingly educated population, and a stable, high share of female labor force participation, which are factors conducive to the development of liberal attitudes. It is to be examined what other socioeconomic factors have contribute to the conservative trends in attitudes towards marriage and family in mainland China.

6 Discussion

The purpose of this study is to provide a descriptive account of changes in the attitudes towards cohabitation, childrearing, and divorce in four East Asian societies from 2006 to 2016. This study addresses whether East Asia has been experiencing the SDT from an ideational perspective. The most important finding is that the pattern of shifting attitudes is opposite between mainland China and the other three societies. Among the four societies, mainland China is the only one that had become more conservative in all the three attitudes. Chinese individuals' attitudes towards marriage and family had become more inconsistent with those that underline the SDT. On the contrary, the other three societies had become more liberal in their views on these attitudes, probably mirroring the ongoing SDT. Trends in the attitude towards divorce are less salient than trends in the attitude towards cohabitation or childrearing. More to the point, the study also has suggested that, in each of the four societies, trends in the three attitudes do not

stem from compositional differences in population. Even with sociodemographic characteristics adjusted for, the contrasting pattern between mainland China and the other three societies still remains. Within societies, trends in attitudes are similar across different sociodemographic groups rather than with SDT forerunner groups leading the trends.

By comparing individuals' changing attitudes with changing patterns of demographic behavior at the societal level, the study suggests that while changes in attitudes and behavior seem consistent in Japan, South Korea, and Japan, the scenario is different for mainland China. Neither socioeconomic development nor demographic patterns at the societal level indicate a clear divide between mainland China and the other three societies, and the four East Asian societies all exhibited signs of the SDT during the study period. Our finding of Japanese people's higher levels of acceptance of the attitude towards cohabitation is consistent with their postponement of first marriage, which also possibly reflects the society's increase in cohabitation behavior (Raymo et al., 2009). In contrast, this consistency does not seem true in mainland China, where the increasing prevalence of pre-marital cohabitation behavior contradicts with the decreasing acceptance of cohabitation (at least over the 2006–16 period), as evidenced by this study.

Both the contrasting pattern of changing attitudes between mainland China and other East Asian societies and the inconsistency between changes in attitudes and behaviors in mainland China seem puzzling and even counter-intuitive, adding a new layer of uncertainty to the debate of the development of the SDT in East Asia, especially mainland China. A possible reason for the observed conservative trends in attitudes in mainland China is that these emerging types of non-conventional demographic behaviors, such as cohabitation, are considered risky and less preferred. In this Chinese context with increasing social inequalities and relatively weak welfare provisions from the state, private life has been becoming more individualized, and individuals tend to rely on themselves and their family to ensure their wellbeing (Davis, 2014); and marriage remains an important channel of upward social mobility, particularly for females (Mu & Xie, 2014). It is possible that Chinese individuals become more conservative and cautious as to the life course trajectory they choose to develop, which can be reflected by their attitudes on marriage and family. Nevertheless, whether or not Chinese individuals actually experience alternative types of partnership and family can be influenced by additional factors aside from attitudes. However, if shifting attitudes are not the primary reason for the family change in mainland China, other reasons than value change should be at play. Admittedly, our understanding of family change in East Asia is still limited. More research is needed to further understand the nuanced differences in shifting attitudes between mainland China and other East Asian societies and the relationship between attitudes and behaviors in these contexts.

What remains uncertain are whether the three examined attitudes can represent values associated with the SDT and, relatedly, whether changes in such values can indicate the development of the SDT in East Asia. Although the three attitude variables used in this study are measuring the perception of cohabitation, childrearing, and divorce respectively, it is not completely clear what these attitudes are referring to. For example, the survey question used to measure the attitude towards childrearing is phrased as "It is not necessary to have children in marriage." This variable can be ambiguous. It can indicate the decoupling of the marriage institution and childrearing, but it can also indicate declining stated fertility intentions among married couples. Despite so, the ambiguity of the question towards childrearing is probably not a major issue because both of its possible interpretations point in the same direction. Supporting either childrearing outside marriage or the unnecessity of having children in marriage is an indicator of the SDT. Overall, we argue that these attitudes are still reliable indicators to measure individuals' beliefs about marriage and family, which are central to the SDT perspective. Although studies on the SDT often draw on the World Value Survey to investigate changes in general value orientations (Atoh, 2007; Lesthaeghe, 2010), we believe that direct measures about attitudes towards marriage and family are important dimensions of understanding this transition process.

It is also critical to note that it is not clear whether increasing trends in attitudes (in the four societies except mainland China) can be considered substantial, given that most increases are only around half point in magnitude. Recalling a finding of this study that the absolute values of attitudes are relatively low, East Asian people's views on alternative marriage and family behavior were still generally conservative in 2016, even with liberalizing trends over the past ten years. With new data in the future, it is interesting to keep track of whether the increasing trends will continue in Japan, South Korea, and Taiwan, and whether mainland China's conservative trends will reverse at some point or deepen continuously. When allowed by data, future cross-society studies with a geographical focus on East Asia can include a larger number of attitudes towards other aspects of marriage and family to explore whether the striking contrasting pattern between mainland China and its neighbors still holds.

Appendix

See Appendix Tables 2, 3, 4.

Table 2 Regression models of the attitude towards cohabitation (four societies)

	Dependent variable			
	Attitude towards cohabitation			
	Mainland China	Japan	South Korea	Taiwan
Survey year: 2016 (Ref = 2006)	− 0.38***	0.68***	0.71***	0.58***
	(− 0.46, − 0.31)	(0.60, 0.76)	(0.56, 0.85)	(0.47, 0.70)
Female (Ref = Male)	− 0.14***	− 0.04	− 0.04	0.04
	(− 0.21, − 0.07)	(− 0.12, 0.04)	(− 0.17, 0.09)	(− 0.07, 0.15)
Age: 30–39 (Ref = 20–29)	− 0.15**	− 0.07	− 0.23*	− 0.19*
	(− 0.27, − 0.04)	(− 0.22, 0.07)	(− 0.42, − 0.03)	(− 0.35, − 0.02)
40–49	− 0.34***	− 0.34***	− 0.62***	− 0.62***
	(− 0.46, − 0.23)	(− 0.48, − 0.20)	(− 0.81, − 0.42)	(− 0.79, − 0.45)
50–59	− 0.51***	− 0.85***	− 1.14***	− 1.25***
	(− 0.63, − 0.39)	(− 0.99, − 0.71)	(− 1.37, − 0.91)	(− 1.43, − 1.07)
60–69	− 0.59***	− 1.20***	− 1.52***	− 1.55***
	(− 0.71, − 0.46)	(− 1.34, − 1.06)	(− 1.79, − 1.25)	(− 1.77, − 1.34)
Education: Upper secondary or post-secondary (Ref = Lower secondary or below)	0.14***	− 0.14	− 0.30**	0.13
	(0.06, 0.22)	(− 0.28, 0.01)	(− 0.52, − 0.08)	(− 0.02, 0.27)
College	0.43***	− 0.03	− 0.26*	0.37***
	(0.29, 0.56)	(− 0.19, 0.13)	(− 0.50, − 0.01)	(0.19, 0.54)
Living in a large city (Ref = No)	0.10*	0.14**	− 0.04	0.04
	(0.02, 0.18)	(0.04, 0.24)	(− 0.17, 0.10)	(− 0.08, 0.15)
Constant	3.88***	4.47***	3.77***	4.05***
	(3.77, 3.99)	(4.28, 4.65)	(3.50, 4.05)	(3.87, 4.24)
Observations	6472	3719	2268	3521
R^2	0.06	0.19	0.11	0.16

The dependent variable is "It is all right for a couple to live together without intending to get married"; the 2006 and 2016 EASS; authors' own calculations; coefficients and 95% CI

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 3 Regression models of the attitude towards childrearing (four societies)

	Dependent variable			
	Attitude towards childrearing			
	Mainland China	Japan	South Korea	Taiwan
Survey year: 2016 (Ref = 2006)	− 0.55***	0.66***	0.77***	0.31***
	(− 0.62, − 0.47)	(0.58, 0.75)	(0.63, 0.90)	(0.19, 0.43)
Female (Ref = Male)	0.11**	0.41***	0.38***	0.33***
	(0.03, 0.18)	(0.32, 0.49)	(0.26, 0.50)	(0.22, 0.44)
Age: 30–39 (Ref = 20–29)	− 0.30***	0.004	− 0.24*	− 0.37***
	(− 0.42, − 0.18)	(− 0.15, 0.16)	(− 0.42, − 0.05)	(− 0.53, − 0.20)
40–49	− 0.25***	− 0.28***	− 0.39***	− 0.40***
	(− 0.38, − 0.13)	(− 0.42, − 0.13)	(− 0.57, − 0.21)	(− 0.58, − 0.23)
50–59	− 0.39***	− 0.56***	− 0.66***	− 0.82***
	(− 0.51, − 0.26)	(− 0.70, − 0.41)	(− 0.87, − 0.44)	(− 1.01, − 0.63)
60–69	− 0.39***	− 0.78***	− 1.22***	− 0.93***
	(− 0.52, − 0.26)	(− 0.93, − 0.63)	(− 1.47, − 0.97)	(− 1.15, − 0.71)
Education: Upper secondary or post-secondary (Ref = Lower secondary or below)	0.20***	− 0.09	− 0.01	0.26***
	(0.11, 0.29)	(− 0.24, 0.06)	(− 0.22, 0.19)	(0.11, 0.41)
College	0.51***	0.14	0.04	0.56***
	(0.36, 0.66)	(− 0.03, 0.31)	(− 0.18, 0.27)	(0.38, 0.73)
Living in a large city (Ref = No)	0.29***	0.09	0.05	0.17**
	(0.20, 0.38)	(− 0.02, 0.19)	(− 0.08, 0.17)	(0.06, 0.29)
Constant	3.66***	3.84***	2.68***	3.59***
	(3.54, 3.78)	(3.64, 4.03)	(2.42, 2.94)	(3.40, 3.78)
Observations	6472	3719	2268	3521
R^2	0.06	0.13	0.11	0.09

The dependent variable is "It is not necessary to have children in marriage"; the 2006 and 2016 EASS; authors' own calculations; coefficients and 95% CI

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 4 Regression models of the attitude towards divorce (four societies)

	Dependent variable			
	Attitude towards divorce			
	Mainland China	Japan	South Korea	Taiwan
Survey year: 2016 (Ref = 2006)	− 0.29***	0.23***	0.56***	− 0.09
	(− 0.37, − 0.22)	(0.16, 0.29)	(0.41, 0.71)	(− 0.21, 0.04)
Female (Ref = Male)	− 0.04	0.02	0.13	− 0.003
	(− 0.11, 0.03)	(− 0.05, 0.09)	(− 0.01, 0.27)	(− 0.12, 0.12)
Age: 30–39 (Ref = 20–29)	0.11	0.14*	0.02	0.29**
	(− 0.01, 0.23)	(0.01, 0.27)	(− 0.20, 0.23)	(0.11, 0.47)
40–49	0.05	0.17**	− 0.09	0.55***
	(− 0.07, 0.17)	(0.04, 0.29)	(− 0.30, 0.12)	(0.36, 0.73)
50–59	0.05	0.21***	0.14	0.68***
	(− 0.07, 0.18)	(0.09, 0.33)	(− 0.11, 0.38)	(0.48, 0.88)
60–69	0.01	0.25***	− 0.50***	0.74***
	(− 0.12, 0.14)	(0.13, 0.37)	(− 0.79, − 0.21)	(0.51, 0.97)
Education: Upper secondary or post-secondary (Ref = Lower secondary or below)	0.15***	0.01	− 0.01	− 0.04
	(0.06, 0.23)	(− 0.11, 0.14)	(− 0.24, 0.23)	(− 0.20, 0.12)
College	0.14	− 0.10	− 0.05	0.03
	(− 0.004, 0.28)	(− 0.24, 0.04)	(− 0.31, 0.21)	(− 0.16, 0.22)
Living in a large city (Ref = No)	0.29***	0.11*	− 0.07	0.16*
	(0.20, 0.38)	(0.02, 0.19)	(− 0.22, 0.07)	(0.04, 0.28)
Constant	4.15***	3.86***	3.84***	3.55***
	(4.04, 4.27)	(3.70, 4.03)	(3.54, 4.14)	(3.35, 3.76)
Observations	6472	3719	2268	3521
R^2	0.02	0.02	0.03	0.02

The dependent variable is "Divorce is usually the best solution when a couple can't seem to work out their marriage"; the 2006 and 2016 EASS; authors' own calculations; coefficients and 95% CI

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

See Appendix Figs. 6, 7, 8, 9.

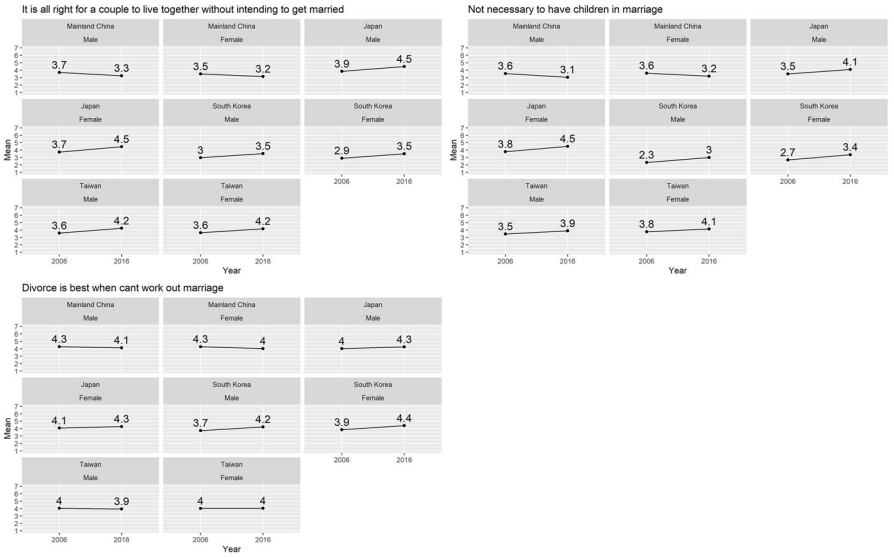

Fig. 6 Trends in attitudes from 2006 to 2016 by society and sex

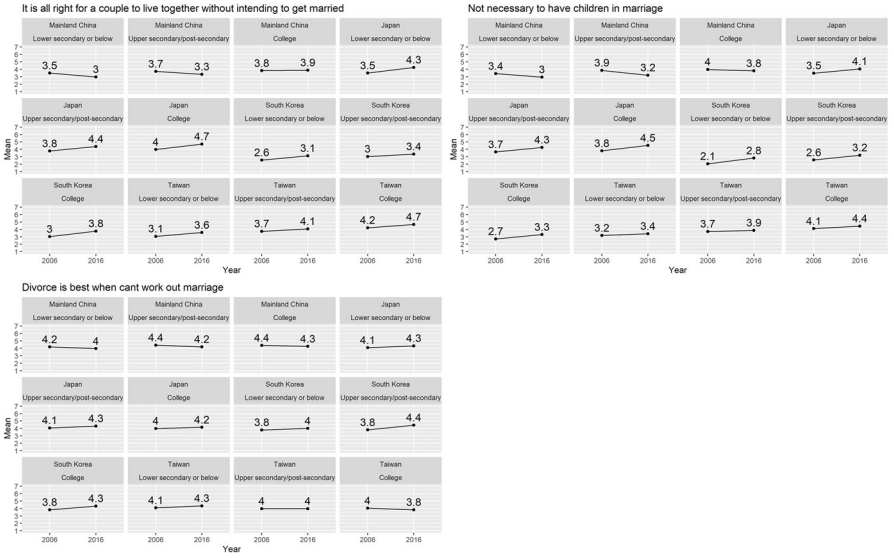

Fig. 7 Trends in attitudes from 2006 to 2016 by society and education

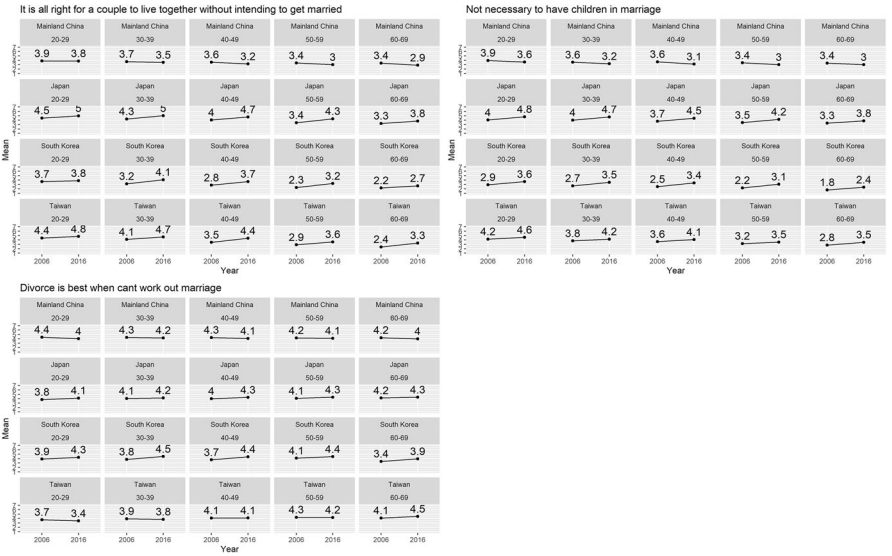

Fig. 8 Trends in attitudes from 2006 to 2016 by society and age

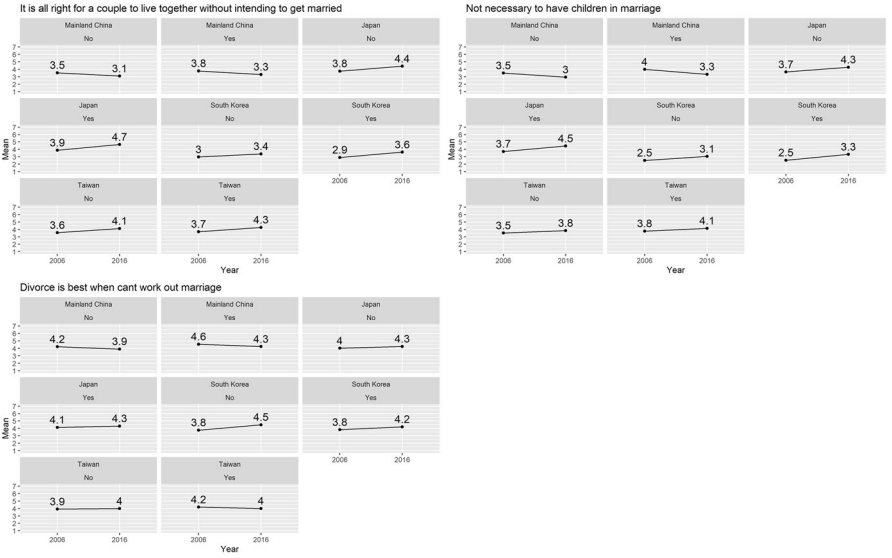

Fig. 9 Trends in attitudes from 2006 to 2016 by society and urban residency

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Declarations

Conflict of interest The authors declare there is no conflict of interest.

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Weiwen Lai is a PhD student in the department of sociology at Stockholm University, Sweden. His research interest is family demography.

Jing Song is an Associate Professor in Gender Studies Programme at the Chinese University of Hong Kong, China and an Associate Researcher (by courtesy) at Shenzhen Research Institute, the Chinese University of Hong Kong, China. Her main research interests include gender and family in urbanization, migration and modernization processes.