

Population Studies

A Journal of Demography

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/rpst20>

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To cite this article: Shuang Chen & Stuart Gietel-Basten (2023): How genuine are sub-replacement ideal family sizes in urban China?, Population Studies, DOI: [10.1080/00324728.2023.2194670](https://doi.org/10.1080/00324728.2023.2194670)

To link to this article: <https://doi.org/10.1080/00324728.2023.2194670>



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Published online: 06 Apr 2023.



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How genuine are sub-replacement ideal family sizes in urban China?

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Ideal family sizes remain at or above two in most low-fertility settings, but sub-replacement fertility ideals have been reported for urban China. The presence of restrictive family planning policies has led to a debate as to whether such ideals are genuine. This study exploits the ending of the one-child policy and the beginning of a universal two-child policy in October 2015 to investigate whether relaxing the restrictions led to an increase in ideal family size. We apply difference-in-differences and individual-level fixed-effect models to longitudinal data from a near-nationwide survey. For married individuals aged 20–39, relaxing the restrictions from one to two children increased the mean ideal family size by around 0.2 and the proportion who desired two or more children by around 19 percentage points. Findings suggest that although reported ideal family sizes have been reduced by policy restrictions, sub-replacement ideal family sizes in urban China appear to be genuine.

Keywords: low fertility; ideal family size; fertility desire; China; one-child policy; family planning; fertility preferences; Asia; fertility; population

[Submitted April 2022; Final version accepted November 2022]

Introduction

In most post-transitional societies, even though actual fertility is well below replacement level, fertility desires measured by personal ideal family size (Ryder and Westoff 1971; Philipov and Bernardi 2012) remain at or above two children (Bongaarts 2001, 2002; Hagewen and Morgan 2005; Sobotka and Beaujouan 2014; Basten and Verropoulou 2015). The discrepancy between actual and desired fertility raises the probability that period fertility is depressed due to temporary factors (Bongaarts 2001). It also indicates ‘unmet demand’ for children and, therefore, room for (more or less explicitly pronatalist) social policies to increase fertility (Chesnais 1996, 2000). For these reasons, desired family size was considered by Bongaarts (2001, p. 278) as ‘the most critical determinant of future fertility’ in post-transitional societies.

In contrast to most post-transitional societies, as China’s period fertility has dropped and reached below-replacement levels (Feeney and Yuan 1994; Morgan et al. 2009; Cai 2010) so has its stated ideal family size (Morgan et al. 2009; Basten and Gu

2013; Hou 2015; Gietel-Basten 2019). Hou’s meta-analysis (2015) estimated the mean ideal family size in the 2000s to be 1.67: 1.50 in urban areas and 1.82 in rural areas. While some believe that small families, or even one-child families, have been embraced as the norm in China (Nie and Wyman 2005; Zhang 2007; Zhenzhen et al. 2009; Merli and Morgan 2011; Basten and Gu 2013), others argue that ideal family sizes have been understated due to the policy restrictions on family size (Hermalin and Liu 1990; Wang 1990, 2015; Merli and Smith 2002). Survey respondents may have factored in the policy restrictions when reporting their ideal family size (Merli and Smith 2002; Morgan et al. 2009; Zheng 2014). Even with a lead-in statement added to survey questions, such as ‘if there were no policy restrictions’, respondents may still understate their ideal family size to provide socially desirable answers, especially during face-to-face interviews (Hermalin and Liu 1990).

Fertility desires measured by personal ideal family size have been shown to predict reproductive behaviours of women in China, especially second and higher-order births (Merli and Smith 2002; Jiang

et al. 2016). Ascertaining ideal family size is therefore central to several current academic and policy debates: Does low fertility persist in China because people prefer few children or because they are unable to achieve their desired fertility? Has the one-child policy internalized small family sizes and, in consequence, brought about enduring changes in the ideal number of children? What would happen to fertility if birth restrictions were relaxed further or removed completely? Has China fallen into a ‘low-fertility trap’ (Goldstein et al. 2003; Lutz et al. 2006) whereby low fertility ideals resulting from low actual fertility in the previous generation lead to further declines in fertility in the subsequent generation? Although many studies have acknowledged that ideal family sizes in China could have been depressed by policy restrictions (Whyte and Gu 1987; Hermalin and Liu 1990; Morgan et al. 2009; Zhenzhen et al. 2009; Merli and Morgan 2011; Gietel-Basten 2019), most have proceeded without empirically assessing or measuring this. The few studies that draw on empirical evidence to estimate whether and to what extent policy restrictions have reduced ideal family sizes (Hermalin and Liu 1990; Wang 1990, 2015; Merli and Smith 2002) rely on descriptive analyses and thus cannot causally attribute any differences (or lack of differences) to the effect of the policy. Most are also limited to a few cities or counties.

In this study, we exploit the formal ending of the last vestiges of the one-child policy and the beginning of a universal two-child policy in October 2015 to investigate whether relaxing the restrictions from one to two children led to an increase in fertility ideals in urban China. To isolate the effects of policy change, we apply difference-in-differences and individual-level fixed-effects models to longitudinal data from a near-nationwide survey. This study adds to a growing body of evidence on the impact of ending the one-child policy (Basten and Jiang 2014; Zhao 2015; Attané 2016; Zeng and Hesketh 2016) and is the first to assess its impact empirically on fertility desires as measured by personal ideal family size. Findings from this study not only have implications for future fertility policies in China but also contribute more broadly to a better understanding of fertility desires.

Background

Sub-replacement fertility and pronatalist policies in China

According to the 2020 Census results announced by the government, China’s total fertility rate (TFR)

was just 1.3, one of the lowest in the world (Reuters Staff 2021). A recent study by Yang et al. (2022) using indirect estimation methods yielded a Chinese TFR in the range of 1.5–1.6 for the period 2000–10 and an average TFR of 1.49 for the period 2011–20. The latest edition of the UN’s *World Population Prospects* (United Nations, Department of Economic and Social Affairs, Population Division 2022) estimated that China’s TFR in 2022 was even lower, at 1.18. Even with all the caveats relating to the challenges of calculating the Chinese TFR (Gietel-Basten 2019, chapter 3), there is little doubt that China has joined the group of countries characterized by (very) low fertility.

This transition to (very) low fertility has, in recent years, been accompanied by increasing concern in both the academic (e.g. Liu and Sun 2015) and popular (e.g. Campbell 2019) literature regarding the consequences of population ageing and, ultimately, negative population growth. In response to this, various branches of national and local government—in common with those of numerous other states around the world—have developed strategies to support and encourage couples to have more children (within their allotted quota). This policy shift is nothing new. More than a decade ago, local governments were encouraging couples who were eligible to have two children to do so. For example, in Shanghai in the late 2000s, Xie Lingli, director of the Shanghai Population and Family Planning Commission, stated: ‘We encourage eligible couples to have two kids because it can help reduce the proportion of elderly people’ (Waldmeir 2009).

In recent years, several local governments (Yeung 2021) and employers (Mistreanu 2022) have introduced ‘baby bonuses’ and other financial and non-financial support packages to stimulate fertility under the conditions of the current three-child policy (see later for a discussion of family planning policies). More generally, China’s most recent (14th) Five-Year Plan includes a statement to ‘promote the attainment of an adequate fertility level’ and describes many measures to support families with childbearing (People’s Congress 2021). The plan states: ‘we will enhance the inclusivity of fertility policy, promote the linkage of fertility policy with economic and social policies, reduce the burden of family fertility, parenting, and education, and release the potential of fertility policy’. These supporting policies include improving ‘end-to-end prenatal, natal, and early education services, strengthening health services during pregnancy and childbirth’, developing childcare systems and ‘child-friendly cities’, and ‘establish[ing] and improv[ing]

a comprehensive support and assurance system for families with special difficulties in family planning’.

In 2021–22 alone, a wide array of policies was introduced to stimulate fertility. These included tax deductions, longer maternity leave, bonuses for third children, housing subsidies, and a crackdown on expensive private tutoring (Master and Zhang 2022). Indeed, in August 2022, 17 government agencies issued a joint set of guidelines on how they planned to develop policies in finance, tax, housing, employment, education, and other fields to ‘create a family-friendly society and encourage families to have more children’ (Global Times 2022). Such policies included promoting pre- and postnatal care; improving maternity leave and insurance; offering preferential house purchase options to families with two or more children; and encouraging kindergartens to take on younger children, aged below three (Global Times 2022; Xin 2022). In contrast, the guidelines also ‘pointed to prevention of unwanted pregnancies and a decrease in non-medical abortions’ (Global Times 2022). It is noteworthy that although local baby bonus schemes are in place, no reference to a national allowance was made in the announcement.

Fertility desires

One marker of the potential success of such policies relies on there being a latent *demand*—or unmet need (Chesnais 1996, 2000)—for children that is currently being hampered by inadequate institutional support or other factors. Demographers have explored this demand through the lens of desired family size (McClelland 1983; Thomson 2015; Yeatman et al. 2020). In many low-fertility settings, a sizeable ‘gap’ has been observed between desired family size and actual fertility (Bongaarts 2001; Lutz et al. 2006; Basten and Verropoulou 2015; Gietel-Basten 2019), and this gap has been used by (especially European) policymakers to justify interventions designed to increase fertility (European Commission 2005).

Fertility *desires*, defined by McClelland (1983, p. 288) as ‘the number of children parents would have if there were no subjective or economic problems involved in regulating fertility’, are to be distinguished from *intentions*, which reflect an implementable plan to achieve a given number of births (Miller 2011; Yeatman et al. 2020). Where intentions exist, the role of policy is relatively modest: ensuring that prevailing circumstances do not change so much as to affect those intentions

and/or their actualization. Fertility desires as measured by personal ideal number of children are also distinct from fertility *ideals* at the societal level, measured in terms of some hypothetical average individual/family (Blake 1966; Ryder and Westoff 1971; Trent 1980; Philipov and Bernardi 2012). Where societal ideals are presented, these can simply reflect prevailing social constructions and norms of the family, for instance a ‘two-child norm’ as seen in many locations (Livi Bacci 2001; Sobotka and Beaujouan 2014). Using societal ideals can lead to an ecological fallacy as far as policy is concerned. As Philipov (2009, p. 356) observed, ‘the fertility gap is measured at the macro level, while policies act at the micro level, being directed towards individuals and couples who might experience frustrated fertility desires’.

There is, however, much controversy over the validity of notions of desired fertility as measured by personal family size ideals (Testa and Grilli 2006; Philipov et al. 2009; Gietel-Basten 2019). Some have argued that the concept is too abstract (Toulemon 1996), not least because ‘ideal’ life circumstances are very difficult to achieve, either through policy intervention or otherwise (Philipov et al. 2009). Others have observed that when ideal family size is compared with tempo-adjusted TFRs, the gap is often less pronounced (Lutz 2007) and the measure does not always properly account for childbearing already experienced or fluctuations in actual fertility (De Santis and Livi Bacci 2001; Van de Kaa 2001).

Despite these critiques, there is still a valid place for studying fertility preferences through the lens of desired family size. Various theoretical formulations have sought to identify the role that fertility preferences play in shaping the broader sphere of family formation. All of these note the importance of some intrinsic desire or ideal family size which, in turn, is shaped and affected by institutions, society, and shifting circumstances to morph into intentions and, then, actualized fertility. In the Theory of Planned Behaviour approach, for example, a fertility ‘goal’ along with a general desire for children is a fundamental part of shaping ultimate fertility intentions (Ajzen and Klobas 2013). According to Miller (2011), meanwhile, fertility desires form an intermediate step between ‘motivational traits’ and ‘fertility intentions’. According to Testa and Grilli (2006, p. 102), personal ideal family sizes reflect ‘personal values and attitudes toward childbearing’, which are then mediated through other factors, such as educational level, labour market, family experiences, actual fertility and, of

course, family policy. At the very least, it is argued, ideal family size may represent an ‘upper limit’ to fertility (Van Peer 2002).

Sub-replacement ideal family sizes in China

Whyte and Gu (1987) published one of the first meta-reviews of studies concerning ideal family size in China. They concluded that ‘it is not simply that fertility has dropped sharply in advance of substantial economic development ... It also appears that the attitudes and aspirations of Chinese peasants have been at least partially “modernized”’ (Whyte and Gu 1987, p. 487). Empirically, they found that mean ideal family size in the early 1980s ranged between 1.50 and 1.81 in six urban settings (with an outlier of Zhejiang province, at 1.15) and between 1.56 and 2.49 in 10 rural areas, with a ‘meta-mean’ of 1.98. More recently, Basten and Gu (2013) performed a meta-analysis of 41 studies and surveys conducted between 1979 and 2009. They found that mean ideal family size in the 1980s and 1990s was generally between 1.6 and 1.8 children. By the 2000s, however, the values found in surveys had fallen to between 1.2 and 1.4 (Basten and Gu 2013). Finally, Hou’s (2015) meta-analysis estimated mean ideal family size in the 2000s to be 1.67 (1.50 in urban areas and 1.82 in rural areas).

In addition to these national-level meta-reviews, several provincial-level analyses have confirmed the presence of a downward trend in mean fertility ideals. In the north-eastern province of Jilin, a study by Choe and Tsuya (1991) found a mean ideal family size of 1.95 among female peasants aged 15–59 in 1985; this had declined to 1.6 a decade later (Basten and Gu 2013). Basten et al. (2010) found strong evidence of low mean ideal family size among Shanghai’s registered population: according to official surveys, it fell from 2.04 in 1983 to 1.07 in 2008, even though a sizable number of couples would have been free to have two children under the official policy and respondents were explicitly asked to consider a future without any policy restrictions. Merli and Morgan (2011), using the Shanghai Sexual Behaviour and Sexual Networks Survey, similarly found that 66.1 per cent of those eligible to have a second child did not intend to do so. Finally, an extensive study of women in six Jiangsu counties who were entitled to have two children revealed an ideal family size of just 1.31 (Zhenzhen et al. 2009).

The sub-replacement ideal family sizes found in China contrast with the overwhelming majority of countries, where various measures of fertility

preferences (including intentions and ideals) are stated as two children or more (Bongaarts 2001, 2002; Hagewen and Morgan 2005; Sobotka and Beaujouan 2014; Basten and Verropoulou 2015). However, it is not unheard of for respondents in other societies to report such sub-replacement preferences. In German-speaking parts of Europe in the early 2000s, for example, reported ideal family sizes among some groups fell as low as 1.7 (Goldstein et al. 2003). In Hong Kong, too, sub-replacement fertility ideals have been reported in recent years (Gietel-Basten 2019, chapter 4), while some evidence of below-replacement *intentions* has been observed in Taiwan (Basten and Verropoulou 2015; Gietel-Basten 2018). In the case of German-speaking countries, however, these very low stated ideal family sizes were not long lived. By 2011, for example, mean ideal family sizes in Austria had risen to two children or above (even though Austrian women reported the lowest ideal family sizes among the Organisation for Economic Co-operation and Development countries; OECD 2011).

China, then, appears to be the only major population in the world that has consistently reported sub-replacement ideal family sizes over an extended period (Zheng et al. 2018). However, China is also a country with a unique history of restrictive family size policies, the (contested) history of which has been discussed at length elsewhere (Greenhalgh 2008; Basten and Jiang 2014; Goodkind 2017; Greenhalgh 2018; Wang et al. 2018; Zhao and Zhang 2018). In short, from the early 1970s, China pursued a policy of *wan, xi, shao*, that is, *later* marriage, *longer* spacing between births, and *fewer* births overall (Banister 1987). At the very end of that decade, a national one-child policy was introduced and strictly implemented through a variety of means (including an extensive education campaign and harsh penalties for having more than one child; Croll et al. 1985). From 1984, however, the strict national one-child policy was relaxed for certain population groups. Over the next two decades, various changes to the policy were implemented meaning that by the 2000s, rather than a one-child policy as such, the birth control policy in China resembled a complex patchwork of exemptions and entitlements which differed by geography, occupation, and family circumstances (Gu et al. 2007). By 2007, all but one province had allowed couples who were both only children to have two children (Zeng and Hesketh 2016). In 2013, this policy was extended: it was announced that all couples where one spouse is an only child would be allowed to apply for certification to have a second child (Zeng

and Hesketh 2016). In October 2015, the government announced the introduction of a national two-child policy (Zeng and Hesketh 2016) and, finally, the three-child policy was introduced in 2021 (BBC News 2021).

Are ideal family sizes in China under-reported due to prevailing policies?

Under these circumstances of strict birth control policies, it is difficult to judge the real meaning of the reported ideal family sizes found in various studies in China. On the one hand, many surveys on ideal family size are performed by local family planning authorities: the same institutions responsible for enforcing prevailing birth control policies, as well as ‘punishing’ those who have births ‘out of quota’. In this setting, it is reasonable to imagine that many respondents would be reticent to give an honest answer to an investigator, even when assured that the question was purely hypothetical (Basten and Gu 2013). On the other hand, if such stated ideal family sizes are entirely an artefact of prevailing birth control policies, and thus are removing all agency from respondents, they could be misleading. After all, fertility in China did fall rapidly, and its (often challenging) conditions for family formation and childbearing are similar to those seen elsewhere (Gietel-Basten 2019; Gietel-Basten et al. 2019). The fact that (period) fertility has remained stubbornly low, even after recent policy changes to allow couples to bear more children, could provide evidence that such stated ideal family sizes are genuine and have, indeed, been internalized. A further explanation, meanwhile, may be that the stated two-child norm seen in most places is as much a social construction of societal expectations about what a ‘normal’ family should look like in those settings as the preference for one child expressed in many Chinese surveys is.

Previous studies have attempted to estimate whether (and the extent to which) policy restrictions on family size have led to under-reporting of fertility ideals in China. Hermalin and Liu (1990) contrasted two fertility surveys conducted in Shanghai around the mid-1980s. They found the mean ideal family size reported in the mail-in survey (2.29) to be at least 0.4 children or 25–30 per cent higher than the mean ideal family size obtained from the face-to-face survey (1.80). Although the study represented the first attempt to assess the validity of responses to questions on ideal family size in China empirically, because the two surveys differed in many ways other

than survey modes (e.g. in sample sizes, sampling procedures, response rates), we cannot know for sure that the mean ideal fertility being lower in the face-to-face survey was due to individuals providing socially desirable responses.

Several studies have compared alternative measures of fertility preferences within the same survey. In 1987, Wang (1990) surveyed women of childbearing age in Shifang county, Sichuan province. The survey not only included a direct question about ideal family size but also asked respondents to choose between two cards illustrating hypothetical families of different sizes and sex compositions. By comparing responses to the direct question with the preferences revealed by the paired comparison of hypothetical families, the author revealed that 80 per cent of those who expressed a desire for one child (in the direct question) and 25 per cent of those who expressed a desire for two children had understated their family size preferences, and the ‘true’ desired family size was about half a child more than the reported value of 1.73. In Merli and Smith’s (2002) survey of four counties between 1991 and 1994, respondents were asked if they felt their current number of children was ‘too few’, ‘just right’, or ‘too many’. In addition, they reported their ideal number of children. Using the discrepancy between the respondent’s actual number of children and their ideal number, the authors obtained an alternative measure of how respondents felt about their current number of children. They found that self-reported feelings were biased towards ‘just right’, that is, respondents exaggerated their contentment about their current number of children. The extent of the bias ranged from three percentage points in Huasheng county to 14 percentage points in Ciqixian county, where 34 per cent reported feeling that the current number of children was ‘just right’ but only 20 per cent had actually had the number of children equal to or greater than their ideal. Most recently, in a nationally representative survey conducted in 2013 (Wang 2015), respondents were asked two alternative questions about their fertility intentions. One question asked: ‘Considering factors such as the family planning policy, your health, and family economic conditions, how many children do you plan to have?’ The other question had a different lead-in: ‘Suppose there are no family planning restrictions and considering factors such as your health and family economic conditions...’ The mean intended family size without family size restrictions was 1.68, whereas the intended family size considering family size restrictions was 0.09 lower.

In addition, several descriptive analyses have compared fertility preferences by policy eligibility. Zhenzhen et al. (2009) surveyed six counties in Jiangsu province in 2006, focusing on couples who were eligible to have two children. The mean ideal family size among women eligible to have two children was estimated to be 1.46, with 55 per cent reporting that a one-child family was ideal. Since they were eligible to have two children, their fertility ideals indicated a genuine preference for one-child families. However, because the demographic characteristics of women who are eligible to have two children are different from those who are not, the findings cannot be extrapolated to the whole population. A more recent nationwide survey revealed that ideal family sizes were lower in regions with more restrictive family planning policies (Zhuang et al. 2014). While this demonstrates a negative correlation between policy restrictions and reported fertility ideals, it cannot be said that more restrictive policies have caused lower reported fertility ideals.

Did ending the one-child policy lead to changes in ideal family size?

The ending of the one-child policy and the introduction of a universal two-child policy at the end of 2015 offers a rare opportunity to investigate if relaxing the family size restrictions led to an immediate increase in fertility ideals. According to a national fertility survey conducted in 2017 (Zhuang et al. 2020), the mean ideal family size among married women aged 20–44 was 1.98. This represents a steady increase from 1.72 in 2001, 1.76 in 2006, and 1.92 in 2013 according to comparable national surveys (Zhuang et al. 2020). The jump in ideal family size from 1.76 to 1.92 coincided with major family planning policy reforms between 2006 and 2013, but because other trends may have occurred concurrently, the descriptive evidence in Zhuang et al. (2020) is not sufficient to attribute the increase in ideal family size to the relaxation of the one-child policy alone.

This current study exploits the introduction of the universal two-child policy in October 2015 to test if relaxing the family size restriction from one to two children led to an immediate increase in fertility ideals in urban China. This attempt to identify a causal link between prevailing restrictions and fertility preferences by exploiting the changes in policy environment is the main contribution of this paper to the existing literature. To estimate the causal effect of changing eligibility from one to two children, we apply two related strategies to data

collected before and after 2015. A difference-in-differences estimator, taking advantage of the fact that the policy change affected the eligibility to have two children only for some individuals but not others, uses individuals who were not affected as a counterfactual for what would have happened to fertility ideals in the absence of the policy change. Another strategy, the fixed-effects model, uses repeated observations on the same individuals in the longitudinal survey, to effectively control for any unobserved individual-level time-invariant characteristics that may be related to both eligibility to have two children and fertility ideals.

Data and methods

Data

This study draws on data from the 2014 and 2018 waves of the China Family Panel Studies (CFPS), the largest near-nationwide, longitudinal survey in China (Xie and Lu 2015). The survey has followed members of 14,960 households from 25 provinces since 2010. Several features of the survey enable us to use quasi-experimental designs to estimate the causal effect of the policy change on individuals' fertility ideals. First, the survey collects the sibship size and structure for each respondent and their spouse. This allows us to determine the family size restrictions and exposure to the policy change for every individual. Second, in 2014 (before the introduction of the universal two-child policy), and again in 2018 (after the introduction of the universal two-child policy), all adult respondents were asked about their ideal number of children. Besides the repeated measures of fertility ideals, the survey also collects repeated measures of individual and household background information. These repeated measures enable us to estimate fixed-effects models that effectively control for any individual-level heterogeneity.

Measurement

To measure ideal family size, in 2014 respondents were asked: 'Without considering the policy restrictions, what do you think is the ideal number of children to have?' In 2018 respondents were asked again about their ideal number of children: 'What do you think is the ideal number of children to have yourself?' Compared with the 2014 question, the 2018 question does not have the lead-in 'without

considering the policy restrictions', and explicitly asks about own personal ideals. The changes in question wording (Merli and Smith 2002; Zhenzhen et al. 2009) do not affect the internal validity of this study, because the analytic strategies (detailed next) effectively control for their potential effect and, more broadly, for any secular trend unrelated to the policy change that might have impacted fertility ideals. In addition to ideal family size, the study also examines two binary outcome variables: whether ideal family size is two or more and whether ideal family size is greater than actual number of children.

Analytic strategies

To estimate the causal effect of the policy change on individuals' fertility ideals, two analytic strategies are used: difference-in-differences and fixed-effects estimators. In the first strategy, we take advantage of the phased reform of the one-child policy. Specifically, in 2014, couples in which at least one of the partners was an only child were already allowed to have two children, which means that the introduction of the universal two-child policy in 2015 affected only individuals in couples where neither partner was an only child. Therefore, we first calculate the difference in fertility ideals before and after the introduction of the universal two-child policy among individuals in couples where neither partner was an only child. This group of individuals is considered the 'treatment group' because their eligibility to have a second child changed as a result of the policy change in October 2015. We then calculate the same difference among individuals in couples where one or both partners were only children. These individuals had already been allowed to have two children by the end of 2013 and are therefore considered the 'control group' who did not experience any further relaxation of policy restrictions in 2015. The causal effect of the policy change is estimated by taking the difference between the two differences. Assuming that the trends in fertility ideals would be the same in both groups in the absence of the policy change, the difference-in-differences approach removes any biases in the change in fertility ideals over time due to secular trends unrelated to the policy change (including changes in question wording between the two waves of the survey).

The second analytic strategy applies an individual-level fixed-effects model to estimate the effect of the introduction of the universal two-child policy on fertility ideals. The fixed-effects model compares the

reported fertility ideals of the same individual before and after the announcement of the policy and, thus, effectively controls for any differences between individuals that might be correlated with both policy eligibility and fertility ideals. More specifically, we use fixed effects (Wooldridge 2001, p. 265) to estimate the following model:

$$y_{it} = \beta w_{it} + \mathbf{z}_{it}\boldsymbol{\gamma} + c_i + u_{it}, \quad t = 2014, 2018 \quad (1)$$

In this model, y_{it} denotes the ideal family size reported by individual i in year t . The independent variable of interest, w_{it} , is a dummy variable indicating whether individual i was eligible to have two children by year t . Individual heterogeneity is denoted by c_i , and u_{it} is the idiosyncratic error. The fixed-effects model controls for any time-invariant, individual-level attributes that may confound the relationship between policy eligibility and reported fertility ideals. Previous research has shown that individuals may change their fertility desires over the life course and/or as their individual- and household-level circumstances change (Heiland et al. 2008; Yeatman et al. 2013; Ray et al. 2018; Trinitapoli and Yeatman 2018). To control further for time-varying characteristics that may confound the relationship between policy relaxation and changes in fertility ideals, equation (1) includes the vector \mathbf{z}_{it} , containing for individual i in year t the year of survey, age, urban/rural residence, employment status, and household income per capita. For the two binary outcomes (i.e. whether ideal family size is two or more and whether ideal family size is greater than actual number of children), linear probability models with the same individual fixed-effects and time-varying controls are estimated. In addition, because ideal number of children is a count variable, we also fit a fixed-effects Poisson model as part of our robustness checks (see Appendix, section 3).

Sample restrictions

For this analysis, we restrict the sample to individuals with non-agricultural *hukou* who were aged 20–39 and currently married during either survey wave. Agricultural and non-agricultural *hukou* are household registration statuses that determine entitlement to various privileges and social benefits in China (Chan and Buckingham 2008). We limit the analyses to individuals with non-agricultural *hukou* because they have been most impacted by changes to the one-child policies since 2010. A large proportion of individuals with agricultural *hukou* were already eligible to have two children by 2010 and thus were

not impacted by the recent reforms. This is due to the previous relaxation of the one-child policy in 1984, which allowed rural couples meeting certain conditions to have a second child (Greenhalgh 1986), as well as regional variation in the implementation of the one-child policy (Gu et al. 2007). We limit the sample to individuals still in their early and middle reproductive years. (According to China's 2020 Population Census, the mean age of women at childbirth was 28 for all births and 33 for second births; Figure A1 in the Appendix (section 4) presents age-specific fertility rates by birth order.) We exclude individuals aged 40 or above because even if they were eligible to have another child, they would have passed their peak reproductive ages, and hence any increase in their fertility ideals would be irrelevant.

From the 1,821 observations of married urban individuals aged 20–39 at the time of the surveys, we delete 64 cases (3.5 per cent) whose treatment status cannot be ascertained (because their own or their spouses' sibship size information is missing) or whose ideal family size is missing. This gives a full sample of 1,757 person-years, which we use for the difference in differences. From the full sample, we take a subset of person-years from individuals interviewed in both survey waves. After excluding observations with missing covariates, we obtain a balanced sample of 880 person-years to be used for the fixed-effects analysis.

Table 1 describes the (unweighted) composition of the two analytic samples and presents summary statistics for the variables used in the analysis. We note some differences between the full and balanced samples in terms of their education and age distributions. The balanced sample contains a higher proportion of tertiary-educated individuals (52 per cent) compared with the full sample. The balanced sample is also about 2.5 years younger on average, with a lower proportion of individuals aged 35–39 (13 per cent vs 45 per cent) in 2014. In the following analyses, we present difference-in-differences estimates using both the full and balanced samples. In the Appendix (section 1), we present sensitivity analyses to check the robustness of our results to sample selection and attrition.

Results

Difference in differences

Panel (a) in Table 2 summarizes the levels and changes in ideal family size for both the full and balanced samples. All estimates are weighted by

the cross-sectional survey weights provided by the CFPS. For the treatment group, mean ideal family size increased slightly, by 0.026 from 2014 to 2018, whereas for the control group, there was a decrease of 0.187. Therefore, the difference in differences of the changes in ideal fertility is 0.213 and significantly different from zero. The estimate is similar when the same analysis is applied to the balanced sample.

Panel (b), Table 2, presents the proportion of individuals desiring two or more children and its change over time. In 2014, over 80 per cent of individuals in the treatment group and over 70 per cent in the control group reported desiring two or more children. Between 2014 and 2018, the proportion remained virtually unchanged for the treatment group but decreased to around 50 per cent in the control group. The sharp decrease in the control group captures the effect of question wording change between the two waves of the surveys: as previously mentioned, compared with the 2014 survey question, the 2018 survey question about fertility ideals omitted the lead-in 'without considering the policy restrictions' and explicitly asked about own personal ideals. Both changes could have led to a decrease in reported ideals, even without any policy change (Wang 2015). By subtracting the change observed in the control group from that in the treatment group, our analytic strategy effectively controls for any secular trend between 2014 and 2018 unrelated to the policy change that might have impacted fertility ideals, including (but not limited to) the change in question wording. According to the difference-in-differences estimate, changing the eligibility from one to two children increased the proportion desiring two or more children by 19.3 percentage points. Using the balanced sample generates an estimate of the same direction and magnitude.

Panel (c), Table 2, presents changes in the proportion of individuals with unrealized ideals (i.e. whose ideal family size is greater than their actual number of children). In the treatment group, the proportion of individuals with unrealized ideals decreased by 15.5 percentage points from 2014 to 2018, but the proportion in the control group decreased even more (by 27.0 percentage points). Thus, changing the eligibility from one to two children increased the proportion with unrealized ideals by 11.5 percentage points. For this outcome, the estimated effect on unrealized ideals is sensitive to the sample selection and attrition: using the balanced sample, the effect size is reduced to 3.7 percentage points and is no longer statistically significant.

Table 1 Description of analytic samples (full and balanced): China, 2014 and 2018

	Full sample		Balanced sample	
<i>Treatment status (percentage)</i>				
Control (one or both only child)	39.85		43.88	
Treatment (neither only child)	60.15		56.12	
<i>Sex (percentage)</i>				
Female	51.71		53.35	
Male	48.29		46.65	
<i>Ethnicity (percentage)</i>				
Non-Han	10.44		10.16	
Han	89.56		89.84	
<i>Education (percentage)</i>				
Less than primary	0.63		0.23	
Primary school	3.36		2.31	
Middle school	21.04		18.94	
High school	26.51		26.33	
Tertiary and above	48.46		52.19	
<i>Number of person-years</i>	1,757		880	
	<i>2014</i>	<i>2018</i>	<i>2014</i>	<i>2018</i>
<i>Ideal number of children</i>	1.81	1.74	1.84	1.72
	(0.62)	(0.76)	(0.74)	(0.56)
<i>Ideal number of children (categorical, percentage)</i>				
Less than two	23.24	31.99	21.59	29.77
Two	73.87	65.07	75.45	67.27
More than two	2.88	2.94	2.95	2.95
<i>Ideal number of children greater than actual number</i>	0.63	0.41	0.68	0.34
	(0.48)	(0.49)	(0.47)	(0.47)
<i>Age</i>	33.38	33.73	30.88	34.88
	(4.02)	(3.79)	(3.12)	(3.11)
<i>Age group (percentage)</i>				
20–24	1.44	0.47	3.00	0.00
25–29	17.57	16.15	27.71	6.00
30–34	35.77	34.63	56.35	33.95
35–39	45.23	48.76	12.93	60.05
<i>Urban</i>	0.87	0.88	0.84	0.89
	(0.34)	(0.33)	(0.37)	(0.31)
<i>Employed</i>	0.86	0.84	0.85	0.85
	(0.35)	(0.36)	(0.36)	(0.36)
<i>Household income per capita (log)</i>	9.70	10.30	9.72	10.24
	(0.94)	(0.95)	(0.86)	(0.97)
<i>Number of children</i>	1.11	1.26	1.05	1.39
	(0.54)	(0.63)	(0.51)	(0.56)
<i>Number of observations</i>	1,110	647	440	440

Notes: Table shows unweighted means and proportions. Standard deviations in parentheses.

Source: Authors' analysis of CFPS (2014, 2018).

Figure 1 presents the difference-in-differences estimates using subsamples defined by individuals' sex, ethnicity, level of education, and number of children in 2014. Not surprisingly, the effect of transitioning to the universal two-child policy on raising fertility ideals was predominantly driven by individuals with less than two children at baseline and individuals of Han majority, whereas there was virtually no effect among ethnic minorities who had become eligible in the earlier policy reforms (Greenhalgh 1986; Gu et al. 2007). There is some evidence that the effect of the policy change on raising the

probability of desiring two or more children was greater among individuals with less than high school education. However, due to limited sample sizes, we are unable to generate more precise estimates for subsample comparisons.

Fixed effects

Table 3 presents estimates from the individual fixed-effects models using the balanced sample. The treatment variable of interest is the change in

Table 2 Mean ideal family size, proportion desiring two or more children, and proportion desiring more than actual number of children, by year and treatment status, and difference-in-differences estimates: China, 2014 and 2018

	Full sample		Balanced sample	
	<i>Treatment</i>	<i>Control</i>	<i>Treatment</i>	<i>Control</i>
<i>(a) Ideal family size</i>				
2014	1.859	1.762	1.879	1.781
2018	1.885	1.575	1.867	1.536
Difference	0.026	-0.187	-0.012	-0.245
Difference in differences		0.213** (0.040)		0.233*** (0.031)
<i>(b) Desires two or more children</i>				
2014	0.808	0.708	0.831	0.724
2018	0.801	0.509	0.831	0.536
Difference	-0.006	-0.199	0.000	-0.188
Difference in differences		0.193** (0.038)		0.193*** (0.022)
<i>(c) Desires more than actual number</i>				
2014	0.624	0.695	0.661	0.703
2018	0.469	0.425	0.339	0.344
Difference	-0.155	-0.270	-0.323	-0.359
Difference in differences		0.115* (0.043)		0.037 (0.044)

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Notes: All analyses using the full sample are weighted by the CFPS cross-sectional weights to be representative of the population in 2014 and 2018. Standard errors (in parentheses) are clustered by survey year \times own/spouse's sibship size cells.

Source: As for Table 1.

eligibility to have two children. The models control for survey year, individuals' age, urban/rural residence, employment status, and household income per capita. According to column (a), the transition to the universal two-child policy leads to an immediate increase in ideal family size, by 0.233, and the effect is statistically significant. Column (b) indicates that the transition to the universal two-child policy increases the probability of desiring two or more children by about 18.7 percentage points, and the effect is statistically significant. According to column (c), the policy change increases the probability of having unrealized ideals (i.e. desiring more than the actual number of children) by 3.7 percentage points, but this effect is not statistically significant. These results are very similar to those from the difference in differences.

Figure 2 illustrates the results from estimating the fixed-effects models on subsamples defined by individuals' sex, ethnicity, level of education, and actual number of children at baseline. These results are only indicative because the small analytic sample limits our ability to generate precise estimates. Nonetheless, consistent with the previous results, there is some evidence that the transition to the universal two-child policy impacts the fertility ideals mainly of individuals of the Han majority and those with less than two children in 2014.

Discussion and conclusions

Previous research has shown that the ending of the one-child policy and the introduction of a universal two-child policy have had a limited impact on raising fertility so far (Basten and Jiang 2015; Attané 2016; Guo et al. 2019; Li et al. 2019). Some scholars have suggested that this limited impact might be due to the 'normalization' of small family sizes in China (Basten and Jiang 2015) and that China may have fallen into a low-fertility trap (Basten and Gu 2013): if ideal family size has fallen below two, even further relaxation of the current three-child policy or complete removal of any restrictions will not raise fertility to replacement level. Understanding the genuineness of these stated ideal family sizes, as this study has aimed to do, is therefore crucial to developing a foundational idea of the true nature of attitudes towards family formation in China, the upper limit to fertility, and the possible impact of policies designed to support families growing. This study has also made a valid contribution to the global literature on fertility ideals in two ways: first, by exploring on an individual level the plasticity of fertility ideals and how they respond to changing exogenous circumstances (Heiland et al. 2008; Yeatman et al. 2013; Ray et al. 2018; Trinitapoli and Yeatman 2018). Second, our

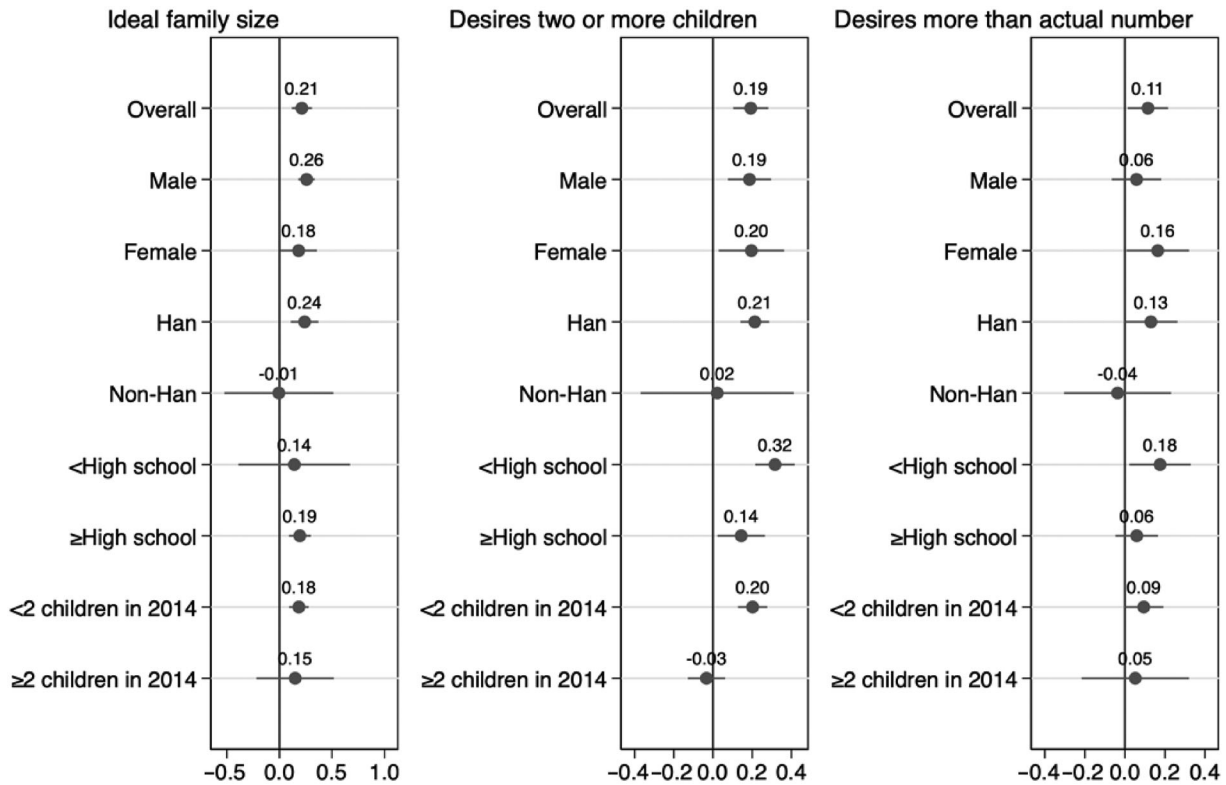


Figure 1 Difference-in-differences estimates of effects of being eligible to have two children on ideal family size, proportion desiring two or more children, and proportion desiring more than actual number of children, overall and by subgroup: China, 2014 and 2018

Notes: All estimates are based on subsets of the full sample and are weighted by cross-sectional weights. Horizontal lines show 95 per cent confidence intervals.

Source: Authors' analysis of CFPS (2014, 2018).

study has contributed to testing the notion of a universal two-child norm in low-fertility settings (Livi Bacci 2001; Sobotka and Beaujouan 2014). Most other areas of very low fertility in the region—such as Taiwan, Singapore, Japan, and the Republic of Korea (Basten and Verropoulou 2015; Gietel-Basten 2018, 2019)—are characterized by a two-child norm. As such, our study can inform the debate over whether China is an outlier.

Before discussing this issue, we must address some potential limitations. First, of course, we were able to assess the impact of just one change in policy: the October 2015 reform (see Appendix, section 2, for a detailed discussion of the external validity of the current study). On release of future rounds of the survey, we would expect to be able to examine the presence of any changes in fertility ideals that may be associated with the implementation of the universal three-child policy in 2021. Second, because of the questions deployed in the survey, we were able to consider only personal fertility ideals, rather than other measures of fertility preferences, such as fertility intentions.

Despite this, we believe that fertility ideals still play a role in the canon of fertility preferences in terms of showing a (possibly socially constructed) vision of an idealized family form that respondents might aspire to in future. Third, our sample size limited our ability to generate precise estimates for subpopulations.

We now return to the main question: Did family size restrictions imposed by the one-child policy depress fertility preferences? Exploiting the introduction of a universal two-child policy in October 2015, this study investigated whether relaxing the one-child restriction led to an increase in the ideal number of children. On one hand, if fertility ideals were completely independent of policy considerations—even when respondents were explicitly told that they should disregard current family size restrictions—and therefore represent a deep, innate, personally held goal, then we would anticipate the policy change to have brought about no change in fertility ideals. On the other hand, if fertility ideals were purely an artefact of policy and a ‘politically correct’ response to survey takers, then

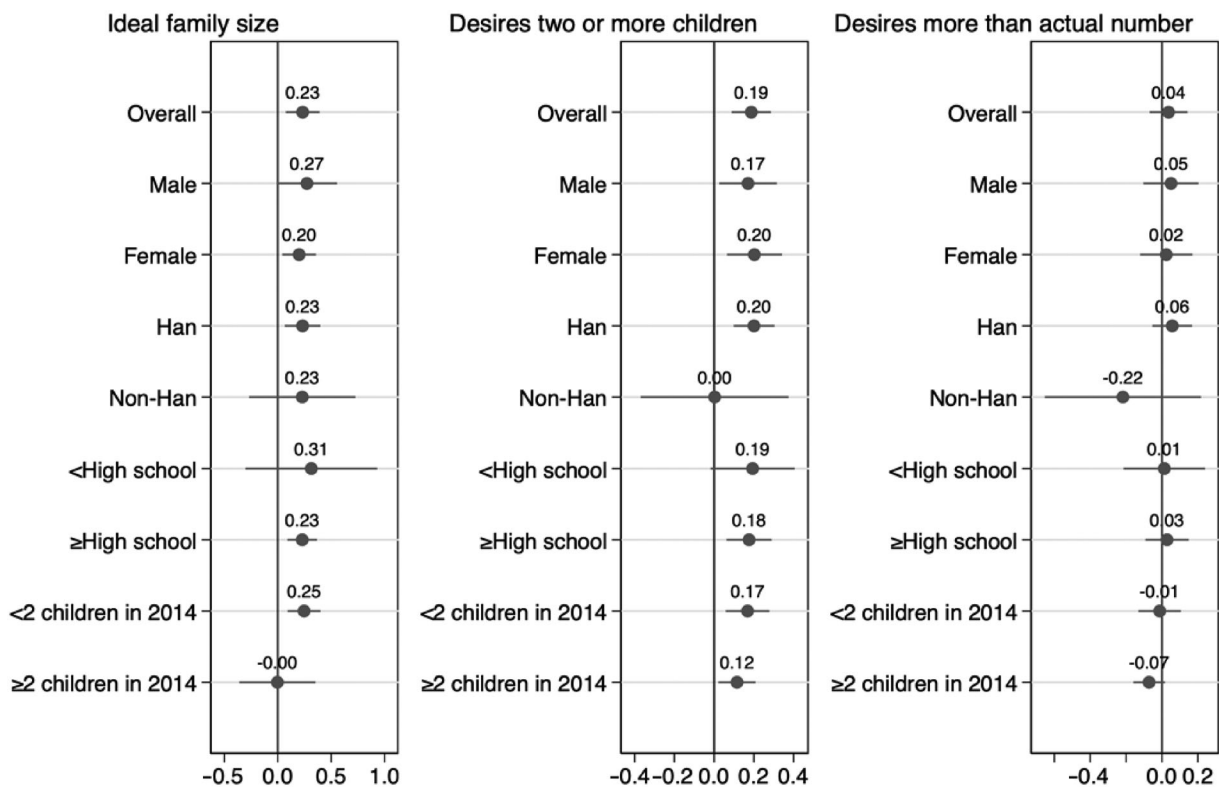
Table 3 Estimates of effects of being eligible to have two children on ideal family size, proportion desiring two or more children, and proportion desiring more than actual number of children, using individual fixed-effects models: China, 2014 and 2018

	(a) Ideal family size	(b) Desires two or more children	(c) Desires more than actual number
<i>Eligible to have two children</i>	0.233** (0.080)	0.187*** (0.050)	0.037 (0.054)
2018	-1.258*** (0.331)	-0.970*** (0.200)	-1.811*** (0.202)
Age	0.255*** (0.069)	0.197*** (0.041)	0.362*** (0.042)
Urban	0.024 (0.150)	0.043 (0.129)	0.054 (0.130)
Employed	-0.085 (0.073)	-0.085 (0.063)	0.029 (0.069)
Household income per capita (log)	-0.015 (0.036)	-0.013 (0.021)	0.002 (0.026)

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Notes: Standard errors (in parentheses) are clustered at individual level. Analysis is based on the balanced sample.

Source: As for Table 1.

**Figure 2** Fixed-effects model estimates of effects of being eligible to have two children on ideal family size, proportion desiring two or more children, and proportion desiring more than actual number of children, overall and by subgroup: China, 2014 and 2018

Notes: Estimates are based on subsets of the balanced sample. Horizontal lines show 95 per cent confidence intervals. Standard errors (in parentheses) are clustered at individual level.

Source: As for Figure 1.

we would anticipate the policy change to have brought about a very dramatic rise in stated fertility ideals. Results (which were consistent between the

difference-in-differences estimates and fixed-effects models) showed that relaxing the restrictions from one to two children increased mean

ideal family size by around 0.2 children and the proportion who desired two or more children by around 19 percentage points. These results provide clear evidence that relaxing the one-child policy led to a statistically significant increase in the ideal number of children and the proportion of individuals desiring two or more children, although the size of the increase was small to moderate. There is no evidence that relaxing the one-child policy had any significant effect on the proportion of individuals desiring more children than they currently had.

We interpret these results to suggest that stated ideal family sizes in China may well lie somewhere between the two ‘extreme’ interpretations set out in the previous paragraph: that is, they represent a genuine preference, albeit *within* the parameters of extant fertility restrictions. As such, these ideals display a degree of plasticity in response to the changing policy context. In a sense, this should not be surprising. The construction of *ideal* number of children is highly complex in all populations (Girard and Roussel 1982; Sobotka and Beaujouan 2014). Indeed, to assume that ideals represent only a deep, innate personal choice that would never be swayed by changing circumstances (not least child-bearing itself) is problematic. While it is certainly more common to find changes in fertility *intentions* or *expectations* over the life course (Quesnel-Vallée and Morgan 2003; Hayford 2009; Morgan and Rackin 2010; Iacovou and Tavares 2011), changes in personal *ideal* family sizes also occur (Heiland et al. 2008; Yeatman et al. 2013; Trinitapoli and Yeatman 2018; Ray et al. 2018; Savelieva et al. 2021; Müller et al. 2022). Reforms to China’s fertility restrictions represented not only changes in the ‘hard’ parameters of the number of children a couple was allowed to bear but also a change in the prevailing attitude and approach to childbearing and families more generally. As such, it should be of little surprise that fertility ideals are plastic to such changes in policy.

Currently, the Chinese government (at various levels) is concerned about fertility rates, which are perceived to be too low nationally. Unease over such low fertility relates to concerns over rapid population ageing and, in the medium to long term, population stagnation and decline. In response, the government is bringing in a wide array of policies designed to stimulate fertility (see Background). Some policies, such as attempting to reduce access to non-medical abortion, are restrictive and run counter to global best practice regarding access to sexual and reproductive health services. Other policies are modelled on widely used family policy

instruments seen across the low-fertility world: expanding maternity coverage, providing tax relief, and tightening up protections for new mothers. While there is a genuine preference for small or one-child families in urban China, the positive effect of relaxing the one-child policy on stated fertility ideals that we found also suggests that the proportion of individuals desiring two or more children is higher than previously thought. This means that there may well be a wider gap between fertility ideals and actual fertility and therefore a greater unmet demand for children (Chesnais 1996, 2000) than previously thought. As such, there still appears to be room for such social policies to mediate the transition from stated ideal family sizes to intentions and reality by removing some of the factors which frustrate the realization of preferences. However, for such policies to be truly effective, it is necessary to go beyond simply identifying the gap (at either the macro or micro levels) and to explore precisely what the underlying *reasons* for the gap are. Such (quantitative and qualitative) explorations will enable policymakers to better determine which factors need to be prioritized to enable such ideal family sizes to be translated into intentions and reality.

Taking a step back, we must explore the motivation for such policies: namely stimulating fertility in China to offset population ageing and stagnation/decline. To offset these challenges better, a more holistic response that addresses the immediate challenges of population ageing and stagnation is required, not least because any new babies born because of such family policy interventions will not enter the labour market for some 15–20 years. In fact, many such policies are present in the current 14th Five-Year Plan. We could argue that many of the family policy instruments discussed in this paper are best described as ‘the right policies but for the wrong reasons’ (i.e. stimulating fertility to offset population ageing). Despite this, by clearly building in individual preferences as measured through ideal family size, the Chinese government could be more closely aligned with the principles of person-centred and rights-based reproductive well-being as set out in the 1994 International Conference on Population and Development in Cairo (United Nations Population Fund 2014).

Notes and acknowledgements

- 1 Shuang Chen is based in the Department of Social Policy, London School of Economics and Political

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- 3 The research reported in this publication was supported by the Eunice Kennedy Shriver National Institute of Child Health and Human Development of the National Institutes of Health under Award number P2CHD047879 and Award number T32HD007163. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.
- 4 The associated data set can be found at: <https://doi.org/10.18170/DVN/45LCSO>.

Disclosure statement

No potential conflict of interest was reported by the authors.

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References

- Ajzen, Icek and Jane Klobas. 2013. Fertility intentions: An approach based on the theory of planned behavior, *Demographic Research* 29(8): 203–232. <https://doi.org/10.4054/demres.2013.29.8>
- Attané, Isabelle. 2016. Second child decisions in China, *Population and Development Review* 42(3): 519–536. <https://doi.org/10.1111/j.1728-4457.2016.00151.x>
- Banister, Judith. 1987. *China's Changing Population*. Stanford: Stanford University Press.
- Basten, Stuart, Wolfgang Lutz, and Qiang Ren. 2010. *Shanghai's Ultra-Low Fertility: The Future for Other Populations?* Paper presented at the Population Association of America Annual Meeting.
- Basten, Stuart and Baochang Gu. 2013. *Childbearing Preferences, Reform of Family Planning Restrictions and the Low Fertility Trap in China*, Oxford Centre for Population Research: Working Paper #61.
- Basten, Stuart and Quanbao Jiang. 2014. China's family planning policies: Recent reforms and future prospects, *Studies in Family Planning* 45(4): 493–509. <https://doi.org/10.1111/j.1728-4465.2014.00003.x>
- Basten, Stuart and Quanbao Jiang. 2015. Fertility in China: An uncertain future, *Population Studies* 69(sup1): S97–S105. <https://doi.org/10.1080/00324728.2014.982898>
- Basten, Stuart and Georgia Verropoulou. 2015. A re-interpretation of the 'two-child norm' in post-transitional demographic systems: Fertility intentions in Taiwan, *PLoS ONE* 10(8): e0135105. <https://doi.org/10.1371/journal.pone.0135105>
- BBC News. 2021. *China Allows Three Children in Major Policy Shift*. Available: <https://www.bbc.com/news/world-asia-china-57303592> (accessed: 20 October 2022).
- Blake, Judith. 1966. Ideal family size among white Americans: A quarter of a century's evidence, *Demography* 3(1): 154–173. <https://doi.org/10.2307/2060069>
- Bongaarts, John. 2001. Fertility and reproductive preferences in post-transitional societies, *Population and Development Review* 27: 260–281.
- Bongaarts, John. 2002. The end of the fertility transition in the developed world, *Population and Development Review* 28(3): 419–443. <https://doi.org/10.1111/j.1728-4457.2002.00419.x>
- Cai, Yong. 2010. China's below-replacement fertility: Government policy or socioeconomic development?, *Population and Development Review* 36(3): 419–440. <https://doi.org/10.1111/j.1728-4457.2010.00341.x>
- Campbell, Charlie. 2019. *China's Aging Population Is a Major Threat to Its Future*. Available: <https://time.com/5523805/china-aging-population-working-age/> (accessed: 20 October 2022).
- Chan, Kam Wing and Will Buckingham. 2008. Is China abolishing the *Hukou* system?, *The China Quarterly* 195: 582–606. <https://doi.org/10.1017/S0305741008000787>
- Chesnais, Jean-Claude. 1996. Fertility, family, and social policy in contemporary Western Europe, *Population and Development Review* 22(4): 729–739. <https://doi.org/10.2307/2137807>
- Chesnais, Jean-Claude. 2000. *Determinants of Below-Replacement Fertility*. Special Issue Nox. 40/41. Population Bulletin of the United Nations. New York: United Nations Population Division.
- Choe, Minja Kim and Noriko O. Tsuya. 1991. Why do Chinese women practice contraception? The case of rural Jilin province, *Studies in Family Planning* 22(1): 39–51. <https://doi.org/10.2307/1966518>
- Croll, E., Penny Kane, and Delia Davin. 1985. *China's One-Child Family Policy*. London: Springer.
- De Santis, Gustavo and Massimo Livi Bacci. 2001. *Reflections on the Economics of the Fertility Decline in Europe*. Paper presented at EURESCO Conference: The second demographic transition in Europe.

- European Commission. 2005. *Green Paper 'Confronting Demographic Change: A New Solidarity between the Generations.'* Available: <https://eur-lex.europa.eu/EN/legal-content/summary/green-paper-confronting-demographic-change-a-new-solidarity-between-the-generations.html> (accessed: 20 October 2022).
- Feeney, Griffith and Jianhua Yuan. 1994. Below replacement fertility in China? A close look at recent evidence, *Population Studies* 48(3): 381–394. <https://doi.org/10.1080/0032472031000147926>
- Gietel-Basten, Stuart. 2018. Fertility preferences in Taiwan, in Stuart Gietel-Basten, John Casterline, and Minja Choe (eds), *Family Demography in Asia: A Comparative Analysis of Fertility Preferences*. Cheltenham: Edward Elgar, pp. 109–120.
- Gietel-Basten, Stuart. 2019. *The "Population Problem" in Pacific Asia*. International Policy Exchange. Oxford: Oxford University Press.
- Gietel-Basten, Stuart, Xuehui Han, and Yuan Cheng. 2019. Assessing the impact of the "one-child policy" in China: A synthetic control approach, *PLoS ONE* 14(11): e0220170. <https://doi.org/10.1371/journal.Pone.0220170>
- Girard, Alain and Louis Roussel. 1982. Ideal family size, fertility, and population policy in Western Europe, *Population and Development Review* 8(2): 323–345. <https://doi.org/10.2307/1972989>
- Global Times. 2022. *17 Chinese Govt Departments Issue Guideline to Boost Population Growth amid Falling Birth Rate*. Available: <https://www.globaltimes.cn/page/202208/1273160.shtml> (accessed: 20 October 2022).
- Goldstein, Joshua, Wolfgang Lutz, and Maria Rita Testa. 2003. The emergence of sub-replacement family size ideals in Europe, *Population Research and Policy Review* 22(5): 479–496. <https://doi.org/10.1023/B:POPU.0000020962.80895.4a>
- Goodkind, Daniel. 2017. The astonishing population averted by China's birth restrictions: Estimates, nightmares, and reprogrammed ambitions, *Demography* 54(4): 1375–1400. <https://doi.org/10.1007/s13524-017-0595-x>
- Greenhalgh, Susan. 1986. Shifts in China's population policy, 1984–86: Views from the central, provincial, and local levels, *Population and Development Review* 12(3): 491–515. <https://doi.org/10.2307/1973220>
- Greenhalgh, Susan. 2008. *Just One Child: Science and Policy in Deng's China*. Berkeley: University of California Press.
- Greenhalgh, Susan. 2018. Making demography astonishing: Lessons in the politics of population science, *Demography* 55(2): 721–731. <https://doi.org/10.1007/s13524-018-0660-0>
- Gu, Baochang, Feng Wang, Zhigang Guo, and Zhang Erli. 2007. China's local and national fertility policies at the end of the twentieth century, *Population and Development Review* 33(1): 129–148. <https://doi.org/10.1111/j.1728-4457.2007.00161.x>
- Guo, Zhigang, Stuart Gietel-Basten, and Baochang Gu. 2019. The lowest fertility rates in the world? Evidence from the 2015 Chinese 1% sample census, *China Population and Development Studies* 2(3): 245–258. <https://doi.org/10.1007/s42379-018-0012-1>
- Hagewen, Kellie J. and S. Philip Morgan. 2005. Intended and ideal family size in the United States, 1970–2002, *Population and Development Review* 31(3): 507–527. <https://doi.org/10.1111/j.1728-4457.2005.00081.x>
- Hayford, Sarah R. 2009. The evolution of fertility expectations over the life course, *Demography* 46(4): 765–783. <https://doi.org/10.1353/dem.0.0073>
- Heiland, Frank, Alexia Prskawetz, and Warren C. Sanderson. 2008. Are individuals' desired family sizes stable? Evidence from West German panel data, *European Journal of Population / Revue Européenne de Démographie* 24(2): 129. <https://doi.org/10.1007/s10680-008-9162-x>
- Hermalin, Albert I. and Xian Liu. 1990. Gauging the validity of responses to questions on family size preferences in China, *Population and Development Review* 16(2): 337–354. <https://doi.org/10.2307/1971594>
- Hou, Jiawei. 2015. Changes in the Chinese population's fertility intentions: 1980–2011, *Social Sciences in China* 36(1): 46–63. <https://doi.org/10.1080/02529203.2015.1001482>
- Iacovou, Maria and Lara Patrício Tavares. 2011. Yearning, learning, and conceding: Reasons men and women change their childbearing intentions, *Population and Development Review* 37(1): 89–123. <https://doi.org/10.1111/j.1728-4457.2011.00391.x>
- Jiang, Quanbao, Ying Li, and Jesús J. Sánchez-Barricarte. 2016. Fertility intention, son preference, and second childbirth: Survey findings from Shaanxi province of China, *Social Indicators Research* 125(3): 935–953. <https://doi.org/10.1007/s11205-015-0875-z>
- Li, Hong-tian, Ming Xue, Susan Hellerstein, Yue Cai, Yanqiu Gao, Yali Zhang, Jie Qiao, et al. 2019. Association of China's universal two child policy with changes in births and birth related health factors: National, descriptive comparative study, *BMJ* 366: l4680. <https://doi.org/10.1136/bmj.l4680>
- Liu, Tao and Li Sun. 2015. An apocalyptic vision of ageing in China, *Zeitschrift Für Gerontologie Und Geriatrie* 48(4): 354–364. <https://doi.org/10.1007/s00391-014-0816-5>
- Livi Bacci, Massimo. 2001. Comment: Desired family size and the future course of fertility, *Population and Development Review* 27(supplement): 282–289.
- Lutz, Wolfgang, Vegard Skirbekk, and Maria Rita Testa. 2006. The low-fertility trap hypothesis: Forces that may lead to further postponement and fewer births in

- Europe, *Vienna Yearbook of Population Research* 4: 167–192. <https://doi.org/10.1553/populationyearbook2006s167>
- Lutz, Wolfgang. 2007. Adaptation versus mitigation policies on demographic change in Europe, *Vienna Yearbook of Population Research* 2007: 19–25. <https://doi.org/10.1553/populationyearbook2007s19>
- Master, Farah and Albee Zhang. 2022. *China to Discourage Abortions to Boost Low Birth Rate*. Available: <https://www.reuters.com/world/china/china-discourage-abortions-boost-low-birth-rate-2022-08-16/> (accessed: 20 October 2022).
- McClelland, G. H. 1983. Family-size desires as measures of demand, in Rodolfo A. Bulatao and Ronald D. Lee (eds), *Determinants of Fertility in Developing Countries, Volume 1, Supply and Demand for Children*. New York: Academic Press, pp. 288–343.
- Merli, M. Giovanna and S. Philip Morgan. 2011. Below replacement fertility preferences in Shanghai, *Population (English Edition)* 66(3): 519–542. <https://doi.org/10.3917/pope.1103.0519>
- Merli, M. Giovanna and Herbert I. Smith. 2002. Has the Chinese family planning policy been successful in changing fertility preferences?, *Demography* 39(3): 557–572. <https://doi.org/10.1353/dem.2002.0029>
- Miller, Warren B. 2011. Differences between fertility desires and intentions: Implications for theory, research and policy, *Vienna Yearbook of Population Research* 2011 9: 75–98. <https://doi.org/10.1553/populationyearbook2011s75>
- Mistreanu, Simina. 2022. *As Chinese Shun Parenthood, Firms Dangle Bonuses, Loans and Leave*. Available: <https://www.aljazeera.com/economy/2022/1/26/as-chinese-shun-parenthood-firms-dangle-bonuses-loans-and-leave> (accessed: 20 October 2022).
- Morgan, S. Philip and Heather Rackin. 2010. The correspondence between fertility intentions and behavior in the United States, *Population and Development Review* 36(1): 91–118. <https://doi.org/10.1111/j.1728-4457.2010.00319.x>
- Morgan, S. Philip, Guo Zhigang, and Sarah R. Hayford. 2009. China's below-replacement fertility: Recent trends and future prospects, *Population and Development Review* 35(3): 605–629. <https://doi.org/10.1111/j.1728-4457.2009.00298.x>
- Müller, Maximilian W., Joan Hamory, Jennifer Johnson-Hanks, and Edward Miguel. 2022. The illusion of stable fertility preferences, *Population Studies* 76(2): 169–189. <https://doi.org/10.1080/00324728.2022.2057577>
- Nie, Yilin and Robert J. Wyman. 2005. The one-child policy in Shanghai: Acceptance and internalization, *Population and Development Review* 31(2): 313–336. <https://doi.org/10.1111/j.1728-4457.2005.00067.x>
- OECD. 2011. *SF2.2: Ideal and Actual Number of Children. OECD Family Database*. Available: <https://www.oecd.org/els/family/database.htm> (accessed: 20 October 2022).
- People's Congress. 2021. *Outline of the People's Republic of China 14th Five-Year Plan for National Economic and Social Development and Long-Range Objectives for 2035*. Xinhua News Agency. https://cset.georgetown.edu/wp-content/uploads/t0284_14th_Five-Year_Plan_EN.pdf
- Philipov, Dimitar. 2009. Fertility intentions and outcomes: The role of policies to close the gap, *European Journal of Population / Revue Européenne de Démographie* 25(4): 355–361. <https://doi.org/10.1007/s10680-009-9202-1.c>
- Philipov, Dimitar, Olivier Thévenon, Jane Klobas, Laura Bernardi, and Aart Liefbroer. 2009. *Reproductive Decision-Making in a Macro-Micro Perspective (REPRO): State-of-the-Art*. Vienna Institute of Demography, European Demographic Research papers No. 1.
- Philipov, Dimitar and Laura Bernardi. 2012. Concepts and operationalisation of reproductive decisions implementation in Austria, Germany and Switzerland, *Comparative Population Studies* 36(2-3). <http://www.comparativepopulationstudies.de/index.php/CpoS/article/view/78>
- Quesnel-Vallée, Amélie and S. Philip Morgan. 2003. Missing the target? Correspondence of fertility intentions and behavior in the U.S., *Population Research and Policy Review* 22(5): 497–525. <https://doi.org/10.1023/B:POPU.0000021074.33415.c1>
- Ray, Colleen, Sela Harcey, Arthur Greil, Stacy Tiemeyer, and Julia McQuillan. 2018. Stability and change in personal fertility ideals among U.S. women in heterosexual relationships, *Demographic Research* 39: 459–486. <https://doi.org/10.4054/DemRes.2018.39.16>
- Reuters Staff. 2021. *China's 2020 Fertility Rate Was 1.3, with 12 Mln Births*. Available: <https://www.reuters.com/article/china-society-census-fertility-idUSL4N2MY140> (accessed: 20 October 2022).
- Royston, Patrick and Ian R. White. 2011. Multiple imputation by chained equations (MICE): Implementation in Stata, *Journal of Statistical Software* 45(1): 1–20. <https://doi.org/10.18637/jss.v045.i04>
- Ryder, Norman B. and Charles F. Westoff. 1971. Orientations toward numbers of children, in *Reproduction in the U.S., 1965*. Princeton: Princeton University Press, pp. 19–36. <https://doi.org/10.1515/9781400886517-002>
- Savelieva, Kateryna, Natalie Nitsche, Venla Berg, Anneli Miettinen, Anna Rotkirch, and Markus Jokela. 2021. Birth cohort changes in fertility ideals: Evidence from repeated cross-sectional surveys in Finland, *SocArXiv*. <https://doi.org/10.31235/osf.io/7vtqm>
- Sobotka, Tomáš and Éva Beaujouan. 2014. Two is best? The persistence of a two-child family ideal in Europe,

- Population and Development Review* 40(3): 391–419. <https://doi.org/10.1111/j.1728-4457.2014.00691.x>
- Testa, Maria Rita and Leonardo Grilli. 2006. The influence of childbearing regional contexts on ideal family size in Europe, *Population (English Edition, 2002-)* 61(1/2). Institut National d'Études Démographiques: 109–137. <https://doi.org/10.3917/pope.601.0099>
- Thomson, Elizabeth. 2015. Family size preferences, in *International Encyclopedia of the Social & Behavioral Sciences*. Elsevier, pp. 805–808. <https://doi.org/10.1016/B978-0-08-097086-8.31064-9>.
- Toulemon, Laurent. 1996. Very few couples remain voluntarily childless, *Population: An English Selection* 8. Institut National d'Études Démographiques: 1–27.
- Trent, Roger B. 1980. Evidence bearing on the construct validity of 'ideal family size', *Population and Environment* 3 (3): 309–327. <https://doi.org/10.1007/BF01255345>
- Trinitapoli, Jenny, and Sara Yeatman. 2018. The flexibility of fertility preferences in a context of uncertainty, *Population and Development Review* 44(1): 87–116. <https://doi.org/10.1111/padr.12114>
- United Nations, Department of Economic and Social Affairs, Population Division. 2020. *World Population Prospects: The 2022 Revision*. Available: <https://population.un.org/wpp/> (accessed: 20 October 2022).
- United Nations Population Fund. 2014. *Programme of Action Adopted at the International Conference on Population Development Cairo, 5-13 September 2014: 20th Anniversary Edition*. Available: <https://www.unfpa.org/publications/international-conference-population-and-development-programme-action/> (accessed: 7 March 2023).
- Van de Kaa, Dirk J. 2001. Postmodern fertility preferences: From changing value orientation to new behavior, *Population and Development Review* 27: 290–331.
- Van Peer, Christine. 2002. Desired and achieved fertility, in E. Kijzing and M. Corijn (eds), *Dynamics of Fertility and Partnership in Europe. Volume 2*. New York: United Nations, pp. 117–141.
- Waldmeir, Patti. 2009. *Shanghai Sidesteps 'One Child' Rule*. Available: <https://www.ft.com/content/925e99f2-787f-11de-bb06-00144feabdc0>
- Wang, J. 1990. Women's preferences for children in Shifang county, Sichuan, China, *Asian and Pacific Population Forum* 4(3): 27–28.
- Wang, Jun. 2015. 生育政策调整对中国出生人口规模的影响 [The influence of fertility policy adjustment to the birth population size in China, *人口学刊 [Population Journal]* 37(02): 26–33. <https://doi.org/10.3969/j.issn.1004-129X.2015.02.003>
- Wang, Feng, Yong Cai, Shen Ke, and Stuart Gietel-Basten. 2018. Is demography just a numerical exercise? Numbers, politics, and legacies of China's one-child policy, *Demography* 55(2): 693–719. <https://doi.org/10.1007/s13524-018-0658-7>
- Whyte, Martin King and S. Z. Gu. 1987. Popular response to China's fertility transition, *Population and Development Review* 13(3): 471–493. <https://doi.org/10.2307/1973135>
- Wooldridge, Jeffrey M. 2001. *Econometric Analysis of Cross Section and Panel Data*, 1st ed. Cambridge, MA: The MIT Press.
- Xie, Yu and Ping Lu. 2015. The sampling design of the China Family Panel Studies (CFPS), *Chinese Journal of Sociology* 1(4): 471–484. <https://doi.org/10.1177/2057150X15614535>
- Xin, Liu. 2022. *China Vows to Improve Nursing Services to Encourage Childbearing*. Available: <https://www.globaltimes.cn/page/202208/1273218.shtml>
- Yang, Shucai, Quanbao Jiang, and Jesús J. Sánchez-Barricarte. 2022. China's fertility change: An analysis with multiple measures, *Population Health Metrics* 20 (1): 12. <https://doi.org/10.1186/s12963-022-00290-7>
- Yeatman, Sara, Christie Sennott, and Steven Culpepper. 2013. Young women's dynamic family size preferences in the context of transitioning fertility, *Demography* 50(5): 1715–1737. <https://doi.org/10.1007/s13524-013-0214-4>
- Yeatman, Sara, Jenny Trinitapoli, and Sarah Garver. 2020. The enduring case for fertility desires, *Demography* 57 (6): 2047–2056. <https://doi.org/10.1007/s13524-020-00921-4>
- Yeung, Jessie. 2021. *These Chinese Villages Are Paying Couples to Have More Children*. Available: <https://www.cnn.com/2021/09/24/china/three-child-cash-incentive-intl-hnk/index.html>
- Zeng, Yi and Therese Hesketh. 2016. The effects of China's universal two-child policy, *The Lancet* 388 (10054): 1930–1938. [https://doi.org/10.1016/S0140-6736\(16\)31405-2](https://doi.org/10.1016/S0140-6736(16)31405-2)
- Zhang, Hong. 2007. From resisting to 'embracing?' The one-child rule: Understanding new fertility trends in a Central China village, *The China Quarterly* 192: 855–875. <https://doi.org/10.1017/S0305741007002068>
- Zhao, Zhongwei. 2015. Closing a sociodemographic chapter of Chinese history, *Population and Development Review* 41(4): 681–686. <https://doi.org/10.1111/j.1728-4457.2015.00090.x>
- Zhao, Zhongwei and Guangyu Zhang. 2018. Socioeconomic factors have been the major driving force of China's fertility changes since the mid-1990s, *Demography* 55(2): 733–742. <https://doi.org/10.1007/s13524-018-0662-y>
- Zheng, Zhenzhen. 2014. 生育意愿的测量与应用 [The measurement and application of fertility intention], *中国人口科学 [Chinese Population Science]* 06: 15–25 +126.
- Zheng, Zhenzhen, Baochang Gu, and Stuart Gietel-Basten. 2018. Chapter 7: Fertility preferences in

- China, in Stuart Gietel-Basten, John Casterline, and Minja Choe (eds), *Family Demography in Asia: A Comparative Analysis of Fertility Preferences*. Cheltenham: Edward Elgar, pp. 109–120.
- Zhenzhen, Zheng, Yong Cai, Wang Feng, and Gu Baochang. 2009. Below-replacement fertility and child-bearing intention in Jiangsu province, China, *Asian Population Studies* 5(3): 329–347. <https://doi.org/10.1080/17441730903351701>
- Zhuang, Ya'er, Yu Jiang, Zhili Wang, Chengfu Li, Jianan Qi, Hui Wang, Hongyan Liu, et al. 2014. 当前我国城乡居民的生育意愿——基于2013年全国生育意愿调查 [The current fertility willingness of urban and rural residents in China: Based on the 2013 National Fertility Willingness Survey], *人口研究 [Population Research]* 38(03): 3–13.
- Zhuang, Yaer, Yu Jiang, and Bohua Li. 2020. Fertility intention and related factors in China: Findings from the 2017 National Fertility Survey, *China Population and Development Studies* 4(1): 114–126. <https://doi.org/10.1007/s42379-020-00053-7>

Appendix: Sensitivity analysis

1. Sample selection and attrition

In the main text, we presented the background characteristics of the full and balanced samples (Table 1). Despite the differences in terms of the unweighted age and education compositions, we showed that the difference-in-differences estimates using the full sample with weights vs the balanced sample were very similar for the ideal number of children and the probability of desiring two or more children (Table 2). The estimated effect on the probability of desiring more children was more sensitive to the sample used.

The fixed-effects models can be estimated only on the balanced sample, which excludes individuals who were interviewed during only one survey wave and/or those with outcome or control variables missing for one or both survey waves. To check that our estimates from fixed-effects models are robust to sample selection and attrition, we conduct multivariate imputations by chained equations, implemented in Stata (Royston and White 2011). As shown in Table A1, the estimated effects on ideal number of children and the probability of desiring two or more children are almost identical between models using the imputed data vs the complete cases. Models fitted on imputed data also show no significant effect of the policy change on the probability of desiring more children (than actual number of children), a similar result to that suggested by models using complete cases. Although without additional information we cannot know the exact mechanism of missing values, and multivariate imputations rely on missing-at-random assumptions (Royston and White 2011), the consistency between the estimates provides further assurance that our results from fixed-effects models are robust to sample selection and attrition.

2. External validity

While our analytic strategies allowed us to identify the causal effect of the policy change, a major limitation is that the treatment effect can be generalized only to individuals who were directly impacted by the October 2015 policy reform, that is, individuals in couples where neither partner was an only child. In other words, both the difference-in-differences and fixed-effects estimators give an average treatment effect on the treated (ATT), which cannot be extrapolated to the average treatment effect (ATE) for the entire population of married urban individuals aged 20–39.

Individuals in the treatment group are not representative of the general population. As shown in Table A2, compared with individuals in the treatment group, those in the full sample are more likely to be at least high school educated and to have less than two children in 2014. Compared with the general population, those in the treatment group are more likely to have been born before 1980 (53 vs 45 per cent). This is not surprising given that the one-child policy was introduced in 1979, meaning that those born later are more likely to be in couples where one or both partners are only children (i.e. the control group) and thus not impacted by the specific policy change in October 2015.

Table A1 Estimates of effects of being eligible to have two children on ideal family size, proportion desiring two or more children, and proportion desiring more than actual number of children, using individual fixed-effects models on imputed data vs complete cases: China, 2014 and 2018

	(a) Ideal family size		(b) Desires two or more children		(c) Desires more than actual number	
	Imputed	Complete	Imputed	Complete	Imputed	Complete
<i>Eligible to have two children</i>	0.223* (0.088)	0.233** (0.080)	0.185** (0.054)	0.187*** (0.050)	0.061 (0.052)	0.037 (0.054)

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Notes: All models control for year of survey, age of individual, urban/rural residence, employment status, and household income per capita. Standard errors (in parentheses) are clustered at individual level. Values for 'Complete' are replicated from Table 3.

Source: Authors' analysis of CFPS (2014, 2018).

Table A2 Characteristics of individuals in the full sample and by treatment status: China, 2014

	Control	Treatment	Full sample
<i>Sex (percentage)</i>			
Female	48.92	54.11	52.16
Male	51.08	45.89	47.84
<i>Ethnicity (percentage)</i>			
Non-Han	7.67	10.69	9.56
Han	92.33	89.31	90.44
<i>Education (percentage)</i>			
Less than primary	0.24	1.30	0.90
Primary school	1.92	5.34	4.05
Middle school	16.55	27.13	23.15
High school	24.94	30.16	28.20
Tertiary and above	56.35	36.08	43.69
<i>Number of children in 2014 (categorical, percentage)</i>			
Less than two	92.33	75.47	81.80
Two	7.67	22.80	17.12
More than two	0.00	1.73	1.08
<i>Birth cohort</i>			
1990–94	1.44	1.44	1.44
1985–89	20.86	15.58	17.57
1980–84	46.04	29.58	35.77
1975–79	31.65	53.39	45.23
<i>Number of observations</i>	417	693	1,110

Source: As for Table A1.

Table A3 Estimates of effects of being eligible to have two children on ideal family size, using individual fixed-effects linear vs Poisson models: China, 2014 and 2018

	Linear	Poisson
<i>Eligible to have two children</i>	0.233** (0.080)	0.142** (0.046)
2018	−1.258*** (0.331)	−0.760*** (0.194)
Age	0.255*** (0.069)	0.154*** (0.040)
Urban	0.024 (0.150)	0.013 (0.086)
Employed	−0.085 (0.073)	−0.052 (0.042)
Household income per capita (log)	−0.015 (0.036)	−0.008 (0.019)

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Notes: Standard errors (in parentheses) are clustered at individual level. Values for the linear model are replicated from Table 3.

Source: As for Table A1.

It is unclear whether the ATT estimated in this study is smaller or greater than the population ATE. On one hand, in the main analyses (Figures 1 and 2), we showed that the effects of the October 2015 policy reform on raising fertility ideals were predominantly driven by those with less than two children at baseline. Given that the general population is more likely to have less than two children at baseline than those in the treatment group, the population ATE might be greater than the ATT estimated in this study. On the other hand, we also found some indicative evidence (Figure 1) that the effect of policy relaxation might be smaller among the highly educated. Given that the general population is more highly educated than those in the treatment group, this implies that the population ATE might be smaller than the ATT estimated in this study. Without more data and information, we are unable to estimate directly the effect of relaxing the one-child policy on other population subgroups or the population ATE.

3. *Alternative model specifications*

Because ideal number of children is a count variable, we fit a fixed-effects Poisson model to the balanced sample and compare the result (Table A3) with that using the linear model presented in Table 3. The Poisson model estimates that the transition to the universal two-child policy led to an immediate 15 per cent increase in ideal number of children, and this effect is statistically significant. The effect size is similar to that from the linear model in Table 3: an increase of 0.233 in ideal number of children, which is a 13 per cent increase from a mean of 1.84 in 2014.

4. *Additional figure*

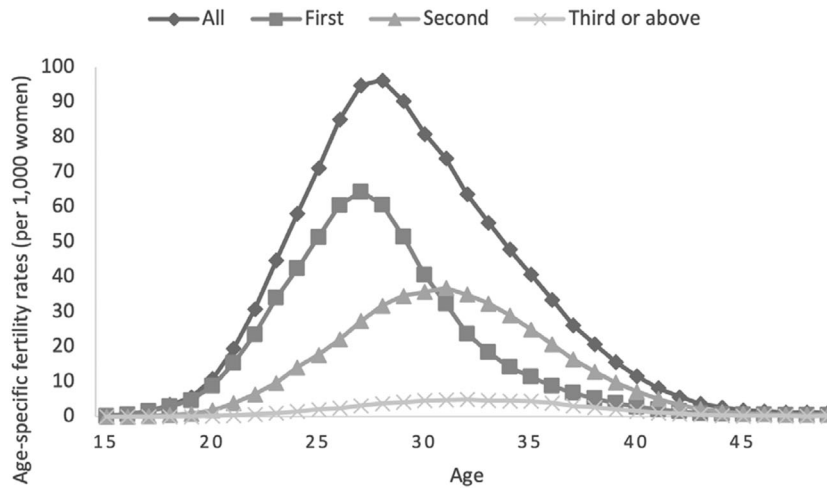


Figure A1 Age-specific fertility rates (per 1,000 women) in China, all births and by birth order, 1 November 2019 to 31 October 2020

Source: 2020 China Population Census.