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Can Superstition Create a Self-Fulfilling Prophecy? School Outcomes of Dragon Children of China

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DISCUSSION PAPER SERIES

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OCTOBER 2020

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ABSTRACT

Can Superstition Create a Self-Fulfilling Prophecy? School Outcomes of Dragon Children of China*

In Chinese culture, those who are born in the year of the Dragon are believed to be destined for good fortune and greatness, and parents prefer their kids to be born in a Dragon year. Using provincial level panel data, we first show that the number of marriages goes up during the two years preceding a Dragon year and that births jump up in a Dragon year. Using three micro data sets from China we show that those born in a Dragon year are more likely to have a college education, and that they obtain higher scores at the university entrance exam. Similarly, Chinese middle school students have higher test scores if they are born in a Dragon year. We show that these results are not because of family background, student self-esteem or students' expectations about their future. We find, however, that the "Dragon" effect on test scores is eliminated when we account for parents' expectations about their children's educational and professional success. We find that parents of Dragon children have higher expectations for their children in comparison to other parents, and that they invest more heavily in their children in terms of time and money. We also show that girls are about six cm shorter than boys, but that this height disadvantage is cut by about half if a girl is born in the year of the Dragon and that effect is twice as strong in rural areas. Given that childhood nutrition is related to adolescent height, this suggests that parents may also be investing in Dragon girls in terms of nutrition. These results show that even though neither the Dragon children nor their families are inherently different from other children and families, the belief in the prophecy of success and the ensuing investment become self-fulfilling.

JEL Classification: I2, J1, Z1

Keywords: education, superstition, zodiac, investment, self-esteem, test score, dragon, China

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Can Superstition Create a Self-Fulfilling Prophecy? School Outcomes of Dragon Children of China

I. Introduction

Cultural beliefs and preferences impact the behavior of individuals who hold these beliefs. For example, the strength of family ties, based on cultural heritage, negatively influence political participation and civic engagement (Alesina and Giuliano 2011); labor supply and fertility rates in a woman's country of ancestry have explanatory power in determining work and fertility decisions (Fernandez and Fogli 2009), and cultural preferences towards leisure have an impact on the labor market activity of women (Mocan 2019). The extent to which residents of a country consider people of another country as untrustworthy has an influence on trade and foreign direct investment between these countries (Guiso et al. 2009).

Beliefs and behaviors, even those that can be thought of as having been engrained in the fabric of culture, react to the economic and institutional environment (Mocan, Bielen and Marneffe 2020, Mocan and Raschke 2016, Alesina, and Fuchs-Schündeln, 2007, Di Tella et al. 2007). Yet, there is substantial persistence in beliefs over long periods of time, and beliefs are transmitted through generations (Voigtlaender and Voth 2012; Guiso, Sapienza and Zingales 2008). Such persistence raises the question of whether cultural beliefs, even if they are completely untrue, can be self-fulfilling. For example, Nunn and Sanches de la Sierra (2017) describe a superstitious belief which has emerged in the Democratic Republic of Congo regarding how to become a bulletproof person through a ritual. They show that, although untrue, this belief helped villagers coordinate their defense activities against a group of bandits who possessed firearms, and it allowed the villagers to defeat the bandits. Even though some villagers died in the process because the ritual never made them bulletproof, that most people believed in this superstition generated a mass movement of

organized and successful defense against the perpetrators, which then reinforced people's beliefs in this particular superstition.

In this paper we investigate whether a cultural belief about the characteristics of a group of people is self-fulfilling, and we analyze the mechanism which is a source of this self-fulfilling belief. We focus on the wide-spread belief in Asian cultures that people born in certain zodiac years are inherently different from those born in other years. Specifically, in China people born in Dragon years are believed to be superior, powerful and destined for good fortune.

Because there is no biological reason for people who are born in a certain time period be more successful economically in comparison to those who are born in adjacent time periods, it is surprising that this superstition has persisted for centuries. In a related domain, researchers started exploring the production of, and the reasons for persistence of “motivated belief distortions,” including such concepts as wishful thinking and willful blindness (Bénabou and Tirole 2016, Bénabou 2015). For example, Bénabou and Tirole state that “People thus hold certain beliefs in part because they attach value to them, as a result of some (usually implicit) tradeoff between *accuracy* and *desirability*. Such beliefs will therefore be resistant to many forms of evidence, with individuals displaying non-Bayesian behaviors such as not wanting to know, wishful thinking, and reality denial.”

We first analyze province level panel data from China and find that the number of marriages goes up during the two years before a Chinese Dragon year, arguably because newly-wed parents would like their offspring to be born in a Dragon year. Consistent with this conjecture, using province panels we also show that the number of births rises in Dragon years. If the cohort size of Dragon children is larger because of parents' demand for a “Dragon child” and the resultant increase in the number of births in Dragon years, this would intensify competition among children

of that cohort in terms of educational resources. For example, class sizes in schools would be larger for kids born in Dragon years, which may reduce the quality of their education. Similarly, competition for a slot in a high-quality college, and competition for good jobs could be more intense because kids born in Dragon years would have to compete with a larger group of same-age peers. If this is the case, and if children born in a Dragon year have worse educational outcomes in comparison to their peers who are similar in age and in other attributes, this would beg the question of how this particular belief about Dragon children being destined for good fortune and greatness could persist.¹

Against this backdrop, we investigate whether educational outcomes of Dragon children are different from that of their peers. We analyze two separate micro data sets and find that students born in Dragon years are *more likely*, as opposed to less likely, to receive higher scores in the national college entrance examination, and that they are more likely to have attained at least a college education in comparison to similar individuals who are of the same age (or who are very similar in age), but who have different zodiac year designations.

When we analyze a third data set that contains detailed information on middle school students, we find that the same pattern exists in middle school. Middle school students who are born in a Dragon year have higher test scores in comparison to other students who are of the same age or similar in age, holding constant many determinants of test scores.

In all three data sets we find that parents of Dragon children and parents of other children have similar educational attainment. The same is true regarding family income and the propensity of parents having white collar jobs. This suggests that the differential educational success of

¹ Suen (2004) shows that in a Bayesian framework if information is difficult to obtain or if the person receives information from like-minded people who provide coarse information, then the existing priors (beliefs) are reinforced, and incorrect beliefs can persist.

Dragon children is not related to family background. Better educational outcomes of Dragon children cannot be related to teacher behavior either because it is unlikely for teachers to know the exact birth dates of their pupils to determine their zodiac, and the university entrance exam scores are graded with no information about student identity.

One potential mechanism that can generate better educational outcomes for Dragon children is higher self-esteem of these children. If children born in Dragon years believe that they are superior to other children, and if Dragon children have higher self-esteem, this could impact their success in school as higher self-esteem and confidence may lead to better learning. The data set on middle school children allows us to analyze this potential channel because it includes questions designed to gauge students' self-esteem and their aspirations about their own future. The data also contain question on parents' expectations about their children's future success. We find that the parents of Dragon children have substantially higher expectations of their children regarding their children's educational attainment and about their children's future success in comparison to other parents. We also find that parents' expectations are transmitted to children. That is, parents shape their kids' self-esteem and confidence: if parents are more hopeful for their kids' future, kids become more self-confident and ambitious for the future. Yet, having a Dragon zodiac has no direct impact on kids' self-esteem and confidence with or without controlling for parent expectations.

We show that parents of Dragon children invest more heavily in their children compared to other parents in terms of time and money. Importantly, we find that the "Dragon impact" on test scores disappears once we control for parents' expectations about their children's future. This indicates that the educational success of Dragon children is driven by parent expectations and parent investment.

It may be the case that parents of Dragon children do not believe in the superstition. They want their kids to be born in a Dragon year for some other reason, but they don't actually think that Dragon kids are destined for greatness.² Yet, they recognize that the Dragon cohorts are larger and therefore their children would be at a disadvantage unless additional resources are allocated to these kids to compensate for the intensity of competition they would face due to the large cohort size. Under this conjecture, Dragon parents invest in their children to counteract the drawback of their kids being a member of a large cohort. We provide evidence against this hypothesis. In the middle school data set the 7th grade consists only of students who were born either in a Dragon year or in a Snake year. This cohort of the 7th graders is large because of Dragon children, and the parents of Snake children are presumably aware of this fact. Thus, parents of children with the Snake zodiac should be similarly worried about the increased competition due to the large cohort size and therefore they too should invest in their kids. This means that there should not be a significant difference between these two groups of parents in terms of investment in their children. However, analyzing this group of Dragon and Snake parents whose children are classmates, we find that Dragon parents' beliefs and behaviors are significantly different from those of the Snake parent. Dragon parents have higher expectations of their children's future than the parents of Snake children whose kids are in the same classrooms. Furthermore, Dragon parents invest significantly more in their children in comparison to Snake parents. Unless one is prepared to argue that parents of Snake children do not care about the success of their offspring, this finding refutes the conjecture that Dragon parents invest in their kids because they are worried about the competition with a large number of students in the cohort.

² As discussed earlier, we show in the paper that Dragon parents have, in fact, higher expectations of their children in comparison to other parents, refuting this claim.

Finally, although we show that parents of Dragon children are no different from other parents in observable ways, they could be different in ways we don't observe as researchers. For example, it could be that mothers of Dragon children are more cognizant of the positive impact of a healthy pregnancy on birth outcomes, and therefore on the long-run benefits for their children. As a result, expectant mothers of Dragon babies may have consumed more health inputs such as medical care and nutritious foods during pregnancy to improve the health of their baby. The most widely-used indicator of health at birth is the birth weight of the baby. Research, however, has shown that an increase in birth weight has only a modest impact on schooling and test scores.³ This indicates that any potential investment in child health by parents of Dragon babies during pregnancy, and the resultant increase in birth weight, is unlikely to be a primary factor that drives the difference in educational outcomes between Dragon children and others.^{4 5}

³ For example, Royer (2009) uses data from California and finds that a one-kilogram increase in birth weight (which is a very substantial increase, given the mean birth weight in the population is about 3,500 grams) is associated with an additional 0.16 years of schooling. Using Florida data, Figlio et al. (2014) find that a one kg. increase in birth weight generates an increase in schooling by 0.156 years. The authors also show that the same 1,000 gr. increase in birth weight is associated with less than 1/20 of a standard deviation increases in tests scores in grades 3 to 8. Bharadwaj et al. (2018) use data from Chile and report that at 10 percent increase in birth weight (which corresponds to a 250-gram increase) raises test scores in math and language by 0.04-0.06 standard deviations. Using Chinese data Rosenzweig and Zhang (2013) find that an increase in birth weight by one standard deviation (about 0.48 lbs, or 220 gr) is associated with increase in a combination of math and language grades of students ages 12-15 by 2.3 to 3.5 percent.

⁴ One mechanism through which birth weight can impact school outcomes is through the potential influence of birth weight on cognition. The research on the impact of birth weight on IQ, however, is not conclusive (Cook and Fletcher 2015, Newcombe et al. 2007). In our data set, there is no difference in the cognitive test scores between Dragon children and other middle school children).

⁵ That we find a significant relationship between Dragon parents' expectations of their kids' academic professional achievement and the investment parents make in their kids, and that these parent expectations explain the difference in test scores between Dragon kids and other kids, does not rule out other ways Dragon parents can help their kids fulfill these expectations. For example, it could be that when Dragon parents invest in their kids in ways we measure in this paper (talking to the classroom teachers more frequently, not asking their kids to help with house chores, etc.), they could also invest in their children in other ways at the same time, such as by buying books and computers for their children, hiring tutors for them, and so on.

In Section II we provide the background regarding the belief on zodiacs in the Chinese culture. Section III presents some stylized facts showing the existence of preferences for Dragon kids in China using national and provincial panel data. Empirical investigation, which consist of three separate data sets and analyses, is presented in Section IV. Section V is the conclusion.

II. Background and Previous Literature

In traditional Chinese culture and in Asian cultures generally, there are 12 creature-zodiacs, which represent different characteristics of the cohorts born in different Chinese lunar years. The order of the zodiacs, depicted in Figure 1, is Rat, Ox, Tiger, Rabbit, Dragon, Snake, Horse, Sheep, Monkey, Rooster, Dog and Pig. The zodiacs follow Chinese lunar calendar, and each zodiac appears approximately every 12 years. For example, the Dragon year of 1988 started on February 17, 1988 (the first day of 1988 in Chinese lunar calendar) and ended on February 5, 1989 (the last day of 1988 in Chinese lunar calendar). Following a 12-year cycle, another Dragon year covered the time span between February 5, 2000 and January 23, 2001.⁶

Of these 12 creatures, Dragon is considered as special because of its place in the legends and mysteries. Dragon is a symbol of auspiciousness and power in Chinese culture. One adage in Chinese states “wang zi cheng long”, which can be literally interpreted as “hope that my children become Dragons.” Chinese people believe that babies born in a Dragon year will have better fortunes than babies born in other years.

⁶ Therefore, if a child was born in 1988, the child’s zodiac sign could be Rabbit (the zodiac before Dragon) or Dragon depending on the specific date of his/her birthday. Similarly, if a child was born in 1989, the zodiac sign of this child may be Dragon or Snake (the zodiac after Dragon), again depending on the specific date of birth.

There is evidence, reported by previous work, that in many Asian countries the fertility rate goes up during dragon years. Vere (2008) reported that the number of live births in Hong Kong increased significantly in the years of 1988 and 2000 which were two Dragon years. The same pattern in birth rates was found among Chinese in Taiwan, Singapore, Malaysia and the U.S.,⁷ suggesting that people of Chinese heritage indeed time the birth of their offspring to coincide with the Dragon years. Yet, no evidence was found in mainland China to indicate the existence of birth timing for Dragon children. Goodkind (1991) argued that compared to Taiwan, Hong Kong, and Malaysia, local institutional conditions in China in the 1970s and 1980s, the Cultural Revolution between 1966 and 1976, and China's birth control policies were factors that prevented China from experiencing baby booms in the Dragon years of 1976 and 1988. During the period of Cultural Revolution, any activity connected with superstition was strictly forbidden, and the One Child Policy had been implemented in China starting in the late 1970s. According to the policy, each couple was allowed to have only one child, and if a couple just missed a Dragon year to have a baby, it would be hard for them to plan for a Dragon baby unless they were willing to wait for 12 years to have a child. Nevertheless, along with the process of becoming more open, the Dragon symbol became acceptable in China again (Goodkind 1991).⁸

As explained in the next section, we show that despite these institutional barriers, parents in mainland China do in fact time the birth of their children. Using national and provincial data on

⁷ Also see Sim (2015), Yip et al. (2002), Wong and Yung (2005), Johnson and Nye (2011), and Goodkind (1991).

⁸ The One Child Policy of China has been relaxed over the years. Starting in 1984, parents were allowed to have a second child as long as both parents were single children themselves. In 2013 the policy has been revised further to allow parents have a second child as long as one of the parents was a single child him/herself. Furthermore, parents can always have more than one child if they are prepared to pay a monetary penalty or lose their government job.

live births we show that the number of live births spiked in the two most recent Dragon years (2000 and 2012)⁹. We also show that the number of marriages goes up during the two years before a Dragon year, which supports the conjecture that couples try and time their marriages and the subsequent pregnancy so that the birth of their child would coincide with the Dragon year.

A handful of studies have examined whether people born in Dragon years have better “fortunes” and reported conflicting results. Using census datasets from Hong Kong, after controlling for education, Wong and Yung (2005) did not find a significant correlation between being born in a Dragon year and labor income. Sim (2015) suggested that due to the large number of new babies born in the Dragon year of 1976 in Singapore, the Dragon cohort should have faced stiffer competition when they apply for universities. He found a negative impact of being born in the year of 1976 and 1977 on the probability of obtaining a college degree in Singapore, although the results need to be interpreted with caution due to the very small sample size employed and the specific way how the Dragon cohort was defined.¹⁰ Johnson and Nye (2011) compared Asian immigrants to the U.S. to non-Asian immigrants and reported a positive impact of being born in a Dragon year on educational attainment among Asian immigrants.¹¹ Do and Phung (2010) found

⁹ Our finding indirectly supports the argument of Goodkind (1991). It seems that when local institutional conditions got better and when the impacts of the Cultural Revolution gradually faded away, the favor of Dragon children re-appeared in mainland China.

¹⁰ In Sim (2015), the “Dragon cohort” is defined as all those born in 1976 and 1977. According to the Chinese lunar calendar, the Dragon year of 1976 started on January 31, 1976 and ended on February 17, 1977. This means that the “Dragon cohort” in Sim (2015) included not only Dragons but also Rabbits (the cohort right before a Dragon cohort) and Snakes (the cohort right after a Dragon cohort). Therefore, the negative “Dragon effect” on college entrance implies that a mixture of three cohorts had lower propensity of getting into a college in Singapore. The author defined the “Dragon cohort” in this way to address that people born in 1976 and 1977 all have to face the competition brought by the baby boom in the dragon year of 1976. The author also mentioned that in the analysis sample the Dragon cohort was on average better educated in the sense that a higher proportion of the Dragon cohort was college graduates in their sample compared with that among other cohorts.

¹¹ It is, however, difficult to interpret the results of Johnson and Nye (2011). In the CPS data used in the paper, the authors classify the “treated” group as those (i) who reported their race as Asians, and (ii) who

that in Vietnam, children born in years that are thought to be auspicious have more years of schooling.¹² Lau (2019) shows that there was spike in fertility in Hong Kong during the Dragon years of 1988, and using a diff-in-diff analysis he finds that both Dragon and non-Dragon students of that Dragon-year cohort increase their time spent studying math, arguably because of competitive pressures of being part of a larger peer group.

III. Aggregate Fertility and Zodiacs in China

Figure 2 presents the annual number of live births in mainland China between 1995 and 2014, obtained from the China Health Statistical Yearbook.¹³ Live births jumped up significantly in 2000 and 2012 which are the two most recent Dragon years. Specifically, the number of live births

should culturally believe in the Dragon superstition. To arrive at the proper treated group the authors correctly drop certain Asians such as Pakistanis, Indians and Filipinos from this group, but they also drop mainland Chinese, although this latter group should be the most impacted by the Dragon superstition. In the other data set used in the paper (the 2000 Census data), the authors restrict the sample to the residents of California who reported their race as Asian, and define the treatment dummy as being equal to one for those who reported their place of birth as Taiwan. Thus, in these models, those with Chinese heritage are placed in the control group and they are considered as not being impacted by the Dragon superstition (Johnson and Nye 2011, p. 95).

Other issues include admitted misclassification of the Dragon variable (footnote 10, and p.95), and the very small number of Dragons in the analysis of mothers (34 individuals in a sample of 14,344, and 116 people in the sample of 48,253; p. 92).

¹² Do and Phung (2010) find that in Vietnam children born in auspicious years have two more months of schooling, and the authors attribute this outcome to the wantedness of children and the planning of these births by the parents. Thus, a hypothesis is that some parents have high expectations of their children and they invest heavily in their children, and that these parents also time their pregnancy so that their children are born in the year of the Dragon. This is not because these parents necessarily believe in the superstition, but “just in case.” In this scenario children are born in the Dragon year not primarily because of parent superstition, but mainly because their parents are investor and planners, (including planning the timing of the birth in a Dragon year). Such a conjecture, of course, begs the question of why non-superstitious parents time the birth of their child to coincide with the Dragon year after all.

¹³ We use the actual number of births rather than the birth rate because population data that are used to calculate the birth rate information provided by the Chinese Statistical Yearbook or by the National Bureau of Statistics of China, are inconsistent over time and across regions, and not reliable. Population figures are estimated using different sources (some from household registrations, some from census estimates, some others from annual national surveys on population changes). In contrast, the data we use are the actual number of live births provided by the China Health Statistical Yearbook.

increased by 289,224 in 2000 compared to the year prior, and by 935,854 in 2012 compared to 2011.¹⁴ Even after the implementation of a new policy at the end of 2013 allowing parents to have a second child as long as one of the parents was a single child in his/her family, the number of babies born in China in 2014 was still much lower than that in 2012, which was a Dragon year.

To more formally analyze the impact of Dragon years on birth as well as marriages, we employed province level panel data on the number of marriages and the number of live births.¹⁵ The results, reported in the Appendix Table A1, indicate that more couples get married in a Tiger year and a Rabbit year, which are the two consecutive years before the Dragon year. This is presumably because getting married within two years before a Dragon year makes it easier for couples to plan for a Dragon baby. The results also show that more births are given in a Dragon year. Thus, Chinese who live in mainland China care about the zodiacs and that they time both their marriages and the birth of their children accordingly, and that about half a million more babies are born in a Dragon year in comparison to other years.

¹⁴ The jump in the Dragon year 2000 may include the impact of parents' wishes to have a "millennium baby". The size of the jump in 2012 could partly be related to the upward trend in births prevailing since 2005.

¹⁵ Using data on the number of marriages newly registered by the government every year between 1979 and 2013, we investigate whether couples are more likely to get married before a Dragon year (so that it would be easier for them to have a Dragon baby). Similarly, using province-level data on live births, we are able to analyze whether more babies were born in Dragon years. The provincial marriage data are from the China Civil Affair's Statistical Yearbook 1979-2014. The data are available for the period of 1978 – 2013. The provincial live births data are available for the year span from 2003 to 2013, collected from the China Health Statistical Yearbook 2004 - 2014. Because the Chinese zodiacs follow the Chinese lunar calendar but the provincial data on the number of marriages and live births follow the Gregorian calendar, and because the two calendars do not overlap perfectly, an adjustment needs to be made to the reported births and marriages. For instance, we let $\text{Dragon} = (366-31-4)/366$ for the year 2000. This is based on the fact that the entire month of January and the first 4 days in February of 2000 do not belong to the Dragon year. Therefore, only $(366-31-4)$ days in the year of 2000 (there are 366 days in 2000 since the year of 2000 is a leap year) belong to the Dragon year. We let Dragon take the value of $23/365$ in the year 2001 because the first 23 days in 2001 were still inside the range of the Dragon year. We define Tiger and Rabbit similarly. We control for per capita income of the province to account for the impact of economic conditions, and province-level unobservables are accounted for by province fixed effects and province-specific linear trends. The data are from 30 provinces/municipalities of China, spanning the years 1979 to 2013.

IV. Empirical Analyses

To investigate the relationship between having been born in a Dragon year and educational achievement, and the potential mechanisms driving such a relationship, we employ three different data sets and entertain three related but different questions as explained below.

1) Analysis of College Education

In the first analysis we investigate the propensity for having at least a college education. Using data from the Chinese General Social Survey we estimate

$$(1) \quad \textit{College}_i = \alpha_1 + \beta_1 \textit{Dragon}_i + \gamma_1 X_i + \theta_c + \xi_i$$

where $\textit{College}_i$ is a dummy variable indicating whether individual i has attained a college education or higher. \textit{Dragon}_i is a dummy variable indicating that an individual was born in the Dragon year. X_i stands for a vector of controls, including gender, age, ethnicity, parents' educational level as well as occupation and survey wave dummies; θ_c stands for province fixed effects, and ξ_i is the error term.

The Chinese General Social Survey (CGSS) used in this analysis is a large and nationally representative social survey that covers all provinces, and both rural and urban areas in China. We use the 2010, 2012, 2013, and 2015 waves of CGSS because the exact birthdates of the respondents are provided in these waves, which allows for the determination of their zodiacs accurately. In addition, these four waves include consistent measurement of parents' employment status. We restrict our data to the survey respondents who were born between 1985 and 1991 (1988 is a Dragon year). Hence, in our effective sample the age of the respondents ranges from 19 to 30. In alternative specifications, we narrow the age window to those who are born between 1986 and 1990 and between 1987 and 1989.

Table 1 presents the summary statistics of the CGSS data set. The total number of observations is 3,835. The Dragon and non-Dragon cohorts are similar in attributes such as gender, ethnicity, and parent education. However, those who are born in the year of the dragon are significantly more likely to have at least a bachelor's degree (35 percent vs. 28 percent). Figure 3 provides the same information by displaying the proportion of individuals with at least a bachelor's degree by their zodiac year, and shows that the Dragon cohort is more likely to have a college education than individuals in both the Rabbit and Snake cohorts.

Table 2 presents the results obtained from estimating Equation (1) using the CGSS data. Note that the CGSS survey is registered in different years. Thus, the respondents who are of the same age in the data may have different birth years. The regressions control for age, thus the variation in zodiac years is obtained from the incomplete overlap between the lunar and Gregorian calendars. All models contain dummies for labor market activity of both the mother and the father. These classifications include not only general categories such as full-time farming, casual worker, individual business, unemployed, retired, and housework, it also includes such categories as disabled and passed away.¹⁶

Column 1 of Table 2 shows that all else the same, those born in Dragon year are seven percentage points more likely to have obtained a bachelor's degree or higher in comparison to individuals born in other zodiac years. When the individual's father has a college degree or higher, the individuals' propensity to obtain a bachelor's degree is increased by around 20 percentage points.

¹⁶ The 17 categories are: 1. Employed by others (having a fixed employer); 2. full-time farmer; 3. Part-time farmer; 4. Contract employee/dispatched worker; 5. Casual worker (no fixed employer); 6. Working in family business, with salary; 7. Working in family business, no salary; 8. Freelance; 9. Individual business; 10. Owner or partner of a business; 11. Retired; 12. Unemployed; 13. Disabled; 14. In school without having a job; 15. Does housework; 16. Passed away; 17. Others.

The sample used in regressions reported in column (1) of Table 2 includes individuals who are born between 1985 and 1991. There is one Dragon cohort in this group: those who are born in 1988 (The Dragon year covered the period between February 17, 1988 and February 5, 1989). To create cohorts of individuals who are more similar in their birth year, we focused on those who are born between 1986 and 1990. This group contains those who are born in the year of the Rabbit (the year before Dragon), the year of the Snake (the year after the Dragon), the year of the Tiger (two years before the Dragon), and Horse (two years after the Dragon). The results are reported in column (2) of Table 2. The sample size goes down to 2,850, but the estimated impact of the Dragon dummy remains significant with a point estimate of 0.06. Narrowing the window of birth year to 1987 - 1989 reduces the samples size further to 1,714 in column (3), but the inference is not altered. The Dragon dummy in column (3) of Table 2 indicates that a Dragon child is six percentage points more likely to receive at least a bachelor's degree.

In summary, consistent with the picture revealed in Figure 3, the results of Table 2 indicate that those who are born in a Dragon year are about 6 percentage points (19 percent) more likely to have a college education in comparison to those born in other zodiac years that are one or two years older or younger.

2) *Performance on National College Entrance Exam*

In the second set of analyses we investigate whether Dragon children perform better in the National College Entrance Examination in comparison to other children. We use the Beijing College Students Survey to estimate

$$(2) \text{CollegeEntranceExamScore}_j = \alpha_2 + \beta_2 \text{Dragon}_j + \gamma_2 \Lambda_j + \rho_s + v_j$$

where *CollegeEntranceExamScore_j* is college student *j*'s score in the National College Entrance Examination. *Dragon_j* is a dummy to indicate that student *j* was born in a Dragon year.

Λ_j stands for a set of controls including the student's gender, ethnicity, parents' educational level, family's economic condition and whether the student took the National College Entrance Examination multiple times.¹⁷ Although the college entrance examination is a national exam in China, the questions differ between provinces and municipal cities in different years. To account for differences in educational quality, we include province fixed effects, ρ_s . Due to the design of the survey, all students surveyed took the exam in either 2006 or 2008; thus, the model also controls for the year in which the student took the exam.

Beijing College Students Survey (BCSS) data include information on about 5,000 students who were randomly selected from 15 universities in Beijing to answer the survey in 2009 (Li, 2016).¹⁸ Students were asked to report when they took the National College Entrance Examinations and what their scores were. The BCSS data include information on the birth year and birth month of the student, but the day of the birth is not reported. Hence, we are unable to determine the zodiacs for those students who were born in a particular month if a lunar Chinese new year started somewhere other than the beginning or the end of that month. We apply two procedures to deal with such cases in which the zodiac cannot be identified with precision. First, we treat those students as having been born in a Dragon zodiac if at least half of the month in which they were born belongs to a Dragon year zodiac. The benchmark results in the paper are based on this procedure. Alternatively, we created an adjusted Dragon dummy which takes the value of the proportion of days belonging to the "Dragon" year in that month. For example, if a student was born in February 1988, the Dragon dummy will be equal to 12/28 (there were 28 days

¹⁷ We also have information on whether the student graduated from an elite high school. Although we do not include this variable as a control as it could be endogenous if Dragon status determines the type of high school the student attends, controlling for this variable does not influence the results.

¹⁸ Almost all the universities in the sample are top 50 schools in China. Only one of them has a rank of 52.

in February of 1988; the first 16 days belong to the Rabbit year, the other 12 days belong to the Dragon year). The results obtained from both procedures were very similar.

The summary statistics of the BCSS data set are presented in Table 3. Our effective sample contains 2,956 observations. Twenty-three percent of students were born in the Dragon year of 1988. In some specifications we created sub-samples with narrower age bands. For example, we focused on those born in the Dragon year (1988), those born the year before (1987) and the year after (1989).

Due to the design of the survey, students in the sample took the national entrance exam in either 2006 or 2008, and we restrict the sample to students who took the exam when they were 18 or 19 years old, which is the typical age when a high school graduate takes the college entrance exam in China. Students whose score is lower than 500 points, and students from Hong Kong, Taiwan, Macaw and Tibet are dropped ¹⁹.

As shown in Table 3, 12 percent of students belong to a minority group in China, and 10 percent of them took the National College Entrance Examination more than once. Parents were asked to rank the income status of their family with respect to average income in their local area, from 1 to 5 indicating from the best to the worst. We create a dummy variable to indicate that the economic status of the student's family is above average. Table 3 reveals that 15 percent of parents indicated that their family income can be classified as such. Table 3 also shows that the average

¹⁹ Every year in each province in China, there is a minimum cutoff point which determines whether a student can go to a "key" college in China. All the students in our sample are from top colleges where the cutoff scores are usually much higher than the cutoff point for "key" colleges. Because the lowest minimum cutoff point in 2006 and 2008 was higher than 500 points in most of the provinces, we therefore drop students whose scores are below 500 points. For the similar reason, we drop students who took the exam in Shanghai, Guangdong or in Jiangsu province in 2008, because the total score in Shanghai, Guangdong or in Jiangsu in 2008 are much different from those in other provinces, which make their students incomparable to other students.

college entrance exam score is about 603, and Figure 4 displays that those with a Dragon zodiac have higher scores in comparison to individuals with other zodiac affiliations.

Table 4 presents the results obtained from estimating Equation (2). The results, reported in column (1) of Table 4 show that, all else the same, the National College Entrance Examination scores of those who are born in a Dragon zodiac are around 10.5 points higher. Although this is only about 1.7 percent impact relative to the average score, this difference can have a profound effect on student placement. This is because a large population of students takes the exam each year in China, and in the extremely competitive environment each additional point has an impact on whether or not, and to which university or major the student will qualify to attend.

Table 4 also shows that female students and minorities have lower scores. In regressions not reported here, we found that those who have attended an elite high school receive substantially higher scores than students who graduate from other high schools, but that adding this (potentially endogenous) variable to the model had no impact on the estimated coefficient of the Dragon dummy²⁰.

Column (2) of Table 4 reveals that students whose parents are better educated score higher on the University Entrance Exam. The same is true if family income is above average. The magnitude of the coefficient of the Dragon dummy is reduced slightly by controlling for parent education and family income. Column (3) restricts the sample to the cohorts born between 1987 and 1989; thus, in this sample students differ in age by a maximum of three years. There was a

²⁰ The elite high schools are called key high schools or key-point (literal interpretation) high schools. There are some key high schools in China in different jurisdictions (province level, city level, county level). The government allocates much more resources to the key high schools, such that the key high schools have more funding, better teachers, etc. Every middle school has to take a high school entrance exam to apply to a high school, and the score a student gets in this exam is the only determinant of the acceptance. Key high schools have higher minimum required scores than ordinary high schools. Some details are discussed in Ye (2015).

Dragon year in 1988 (between February 17, 1988 and February 5, 1989). Thus, of the 2,029 students in this sample (born between 1987 and 1989), 622 (30.7%) are born in the year of the Dragon, 666 (31.9%) are born in the year of the Snake, and the rests are born the year of the Rabbit or Tiger. In this sample, being a Dragon child is associated with an increase in the College Entrance Exam score by about 9.1 points. The results using the adjusted Dragon dummy are reported in columns (4) to (6) in Table 4. The inference did not change. Overall, the results in Table 4 show that, controlling for a number of covariates, having been born in a Dragon year leads to an increase in the university exam score by about 9 points.²¹

3) *Analyses of Middle School Test Scores*

In the third set of analyses, we examine the relationship between having a Dragon zodiac and the test scores among middle school students by making use of the China Education Panel Study (CEPS) data. We estimate regressions of the form:

$$(3) \quad TestScore_{ks} = \alpha_3 + \beta_3 Dragon_k + \gamma_3 \Theta_k + \lambda_c + \mu_k$$

where $TestScore_{ks}$ is the mid-term test score of student k in subject s , where the subjects are Mathematics, Chinese and English. $Dragon_k$ is a dummy variable equal to one if student k was born in a Dragon year. Θ_k is the vector of control variables, including the attributes of the students such as age, gender, type of *hukou*,²² ethnicity, and whether they are the only child in their

²¹ It should be kept in mind that this sample contains some of the best students in China. With the exception of one, all universities in the sample are among the top 50 in the country. Although there is no clear reason as to why the parents of these students would be systematically different from other parents, to the extent that families of these students have stronger (weaker) superstitions about the Dragon Zodiac that form their expectations about the success of their offspring, the results in Table 4 overstate (understate) the connection between the dragon zodiac and university entrance exam scores nation-wide.

²² *Hukou* can be understood as a certificate of residency in China. It is correlated with people's choices and rights in terms of housing and schooling.

family.²³ Also included in the data set are parents' characteristics, ranging from parents' education to whether parents have white collar jobs, to the income level of the family, reported by parents.

λ_c stands for a set of classroom fixed-effects, and μ_k is an error term.

Using the same data, we also run models depicted by Equation (3), but we employ as dependent variables those that gauge the extent of students' self-esteem and aspirations, reported by the students. These dependent variables include the following six separate indicators that measure if the student believes he/she is (i) articulate, (ii) a fast thinker, (iii) a quick learner, (iv) has faith in his/her future, (v) wants to go to college, and (vi) if s/he expects to be a leader or officer at national/government institutions, a scientist, an engineer or an executive in a company.

We similarly analyze the extent to which parents' expectations regarding their children's future are different between parents of Dragon-year children and other parents. These regressions follow the same format as Equation (3), but the dependent variables include such measures as whether the parent expects his/her child to obtain at least a college degree, whether the parent expects the child to get a job in the future as a leader or officer at national/government institutions, a scientist, an engineer or an executive in a company, and whether the parent has faith in the child's future.

Finally, we investigate parents' investment in their children. These variables include whether the child went to kindergarten²⁴, the amount of pocket money parents give to the child (in middle school), how many times parents have talked to the teachers the current semester, and whether the kids do any chores at home, helping parents.

²³ The CEPS data provide information on students' cognitive ability. The baseline regressions do not include this variable as cognitive ability may be "determined" by the zodiac of the student if cognitive ability measures, in part, skills learned at school or in the family. Adding cognitive ability to the model, however, has no impact on the results.

²⁴ In China children are not allowed to enter kindergarten before they are 3 years old.

It is conceivable that the parents of Dragon children are systematically different from other parents. For example, they may be more educated, or they can have more income. In all three data sets we investigated whether Dragon parents differ from other parents in observable dimensions, ranging from parent education to occupation and family income. As explained below, there is no difference between the two groups of parents in terms of these attributes, and controlling for these attributes in regressions does not alter the results.

The CEPS sampling design is based on randomly selecting 438 classrooms from 112 schools in 28 districts, counties or cities, after the first-stage stratification by education level and intensity of population mobility. In the main analyses, we use the first wave of CEPS, which is conducted in 2013-2014. CEPS collects data on middle school students in grades of 7 and 9, who were born in 1996-2002. Consequently, we have one Dragon cohort (spanning February 5, 2000 to January 23, 2001).

As shown in Table 5, of approximately 15,000 middle school students in our sample, 23 percent were born in the Dragon year of 2000. About half of the students are female. The data set contains the mid-term test scores in the subjects of Mathematics, English and Chinese. The mid-term exam scores are provided by the head teacher of the class or the dean of studies in these middle schools.

A unique aspect of this data set is the questions about self-esteem and expectations about the future. The students answered questions measuring their self-esteem and ambitions and expectations about their future. Specifically, students are asked to evaluate statements about themselves by providing a rating to each statement, ranging from 1 “Completely disagree” to 4 “Completely agree”. The dummy variable *Articulate* takes the value of 1 if the student “completely agrees” or “agrees” with the statement that “I can express my opinions clearly.” *Fast Thinker* is

another dummy variable that takes the value of 1 if the student completely agrees or agrees with the statement of “I respond quickly to things”. *Quick Lerner* takes the value of one if the student believes that s/he can learn new knowledge quickly.

The students were also asked to evaluate the extent of their faith in their own future. Possible answers range from “I have no faith at all in my future” to “I have a lot of faith in my future.” We build a dummy to indicate that a student has some faith or a lot of faith in his/her future. In addition, the survey asks the students what degree they would like to obtain and what kind of job they would like to have in the future. The variable *Wants A Bachelor’s Degree or Higher* takes the value of one if the student wishes to obtain at least a college degree. We define *Strong Career Ambition* as a dummy variable indicating whether a student expects to have a job as a leader or officer at national/government institutions, a scientist, an engineer or an executive in a company.

The CEPS contains information about parents’ expectations of their children’s future. We create a dummy variable to indicate that parents expect their children to obtain at least a bachelor’s degree based on the question: “what degree do you expect your children to achieve?” Parents are also asked the question “what occupation do you expect your children to have in the future?” We created a dummy variable to indicate whether parents have strong career ambition for their children, revealed by their expectation of their children becoming a leader or officer at national/government institutions, a scientist, an engineer or an executive in a company. Another dummy takes the value of one if parents are “confident” or “very confident” that their children are going to have a bright future. We also constructed a dummy variable to indicate whether parents expect of their child to perform better than class average.

We created a set of dichotomous indicators that measure various aspects of parents’ investment in their children. For example, we created a dummy variable to indicate whether

parents have contacted the teachers of their kids frequently in the current semester. We also built a variable which measures the amount of pocket money given to the kids each week by their parents. The CEPS survey asks the students whether they usually help parents in housework and during the summer/winter holiday. A similar question asks the students how much time they spent helping parents with house chores during the past week. We created two separate dummy variables indicating whether the kids help parents around the house with chores during the holiday, and whether the child helped with house chores during the past week. The survey also contains a question asking the students whether they ever attended kindergarten after the age of three. We treat the information on the kindergarten attendance as another aspect of parents' investment in children and we create a dummy variable which takes the value of one if the child attended kindergarten.

We observe in the data whether it was the mother or the father who answered the questions about parents' expectations, and we add this dichotomous indicator to the relevant regressions as a control. We drop an observation if someone other than the student's biological parents (e.g. stepparent, uncle, or grandfather) answered the survey questions.

We have indicators for both the mother and the father having at least a college degree. Similarly, *Father White Collar* and *Mother White Collar* are two dummy variables indicating whether the father and the mother have white collar and skilled jobs. The model also includes a dummy variable gauging the income status of the family. Parents were asked about their current economic conditions of their family. The alternatives were: very bad, bad, intermediate, rich and very rich. The dichotomous variable *Family Has High Income* takes the value of one if the parent indicated that he/she their family income was above average.

As was the case in the BCSS data described earlier, the CEPS data contain information on the month and year of birth, but not the day of birth. Thus, we used the same procedure that we employed in the BCSS data and considered students as having been born in a Dragon zodiac if at least half of the month in which they were born belonged to a Dragon year zodiac. An alternative method, where the Dragon dummy equals the proportion of days belonging to the “Dragon” year in that month, provided very similar results.²⁵

The regressions reported in Table 6 analyze the impact of having been born in a Dragon year on test scores of middle school students. The regressions use 13,309 middle school students who are in the 7th or 9th grade in 438 classrooms from 112 schools. In this sample, those born in 2000 have the zodiac of the Dragon. Figure 5 presents the timeline of the Gregorian calendar, its overlap with the relevant zodiacs and the school years.

The results in Table 6 display three regressions, where the dependent variables are students’ midterm test scores in Mathematics, Chinese and English. In addition to student characteristics, the regressions also control for parent attributes and classroom fixed effects. The coefficients reported in Table 6 reveal that parent education has a significant impact on test scores in all three subjects. Female students score higher, and age-for-grade has a negative impact on midterm scores.

Column (1) of Table 6 shows that the students born in a Dragon year score higher in Mathematics, although the estimated impact is not statistically different from zero. Columns (2) and (3) indicates that Dragon children score higher in both Chinese and English mid-term exams and that these magnitudes are statistically different from zero. Specifically, being born in the Dragon year leads to around 0.04 and 0.03 of a standard deviation increase in the test scores in

²⁵ For example, if a student was born in February 1988, the Dragon dummy will be equal to 12/28 (there were 28 days in February of 1988; the first 16 days belong to the Rabbit year, the rest 12 days belong to the Dragon year).

Chinese and English, respectively. The magnitude of the effect is as large as peer effect and teacher's gender effect found in some previous studies (e.g. Lavy et al., 2012; Hanushek et al., 2009; Brunello et al., 2010; Lim and Meer, 2017). Alternatively, we present the results obtained utilizing the adjusted Dragon dummy in the Appendix Table A2. The results are very similar to the results displayed in Table 6

As an alternative approach we calculated the rank of each student within school-grade block for each subject. Using students' rank in each subject as dependent variables provided the same inference as Table 6. Similarly, using the standardized test scores did not change the conclusions. These results are provided in Appendix Table A3 and A4.

Are Dragon Parents Different?

As mentioned earlier in the paper, it can be argued that parents of Dragon children may be different from other parents. For example, they may be more educated, or they may have higher incomes. If such attributes of the parents make them more likely to time their birth and make them more likely to have a Dragon child, and if these attributes also impact child outcomes, then it would be the influence of these factors that impact child's education and test scores. To eliminate such confounding in the regressions we control for all available parent attributes, including income, occupation and education.

To formally investigate whether Dragon parents and other parents differ from each other in observable dimensions, we run parent attributes on a dummy to indicate if their child was born in Dragon year. We do this in all data sets used in the paper. The results are reported in Table 7. Panel A displays the results from the CGSS sample, which shows that the probability of the father having at least a bachelor's degree is not different between the father of Dragon children and other

fathers. The coefficient of the Dragon dummy is 0.005 and highly insignificant. The same is true about mothers' education. Mothers of Dragon children are no more likely to have a college education or higher. Panels B and C of Table 7 demonstrate the same picture in other data sets. In no case do we see a difference between the parents of Dragon children and other parents regarding their education, income or the probability of having a white-collar occupation.

Parents' Beliefs, and Transmission of Beliefs to Children

Middle school test score regressions in Table 6 control for parents' education, parents' job type (white collar occupations) and an indicator for high family income. Therefore, the impact of the Dragon zodiac on test scores are not driven by parents' education or income. It could, however, be the case that Dragon children have higher self-esteem and stronger beliefs in their future success than other kids, and that higher self-esteem can have a positive impact on test scores.

To investigate the interplay between parents' expectations, students' self-esteem, and test scores, we first analyzed parents. The middle school data set includes questions about how parents perceive their kids' future and how they expect their children's future to look like. The questions that were posed to parents include whether parents believe their child will obtain at least a high school diploma, whether they believe that their child will obtain at least a bachelor's degree, whether they expect the child to become a leader or officer in national/government institutions, a scientist, an engineer or an executive in a company, and whether they have faith in their child's future.²⁶ Table 8 presents the results of the regressions where parent expectations are used as dependent variables. The models include attributes of the children, as well as parent characteristics

²⁶ There are 64 parents in the data who expect their children's education to stop before regular high school but still wish their children to find a job as a leader or employer in government or national institutions.

including parent education and family income status. In all cases the Dragon dummy is positive, and in four of the five models it is highly significant. This indicates that all else the same, parents have higher expectations of their child if their child is born in the year of the Dragon. Because we investigate multiple outcomes in Table 8 that gauge different but related parent expectations, we adjust the p -values of the Dragon dummy for multiple hypothesis testing (Newson 2010, Benjamini and Yekutieli 2001). The adjusted p -values, presented in the footnote of Table 8, reveal that the inference is not altered.

Transmission of Expectations from Parents to Children

Table 9 reports regression results that analyze students' self-evaluations on six dimensions. For example, the dependent variable in column (1) of Table 9 is a dummy variable to indicate if the student believes that she/he can articulate his/her thoughts clearly. The dependent variable of the model in column (2) is an indicator on whether the student believes that he/she is a fast thinker. Other self-evaluated attributes are whether the student believes that she/he is a quick thinker, whether she/he wants to obtain a college degree, whether she/he wants to be a leader or officer at national/government institutions, a scientist, an engineer or an executive in a company and whether he has faith in this/her own future. The descriptive statistics of these variables are provided in Table 5.

Panel A of Table 9 presents simple correlations between the Dragon zodiac and children's self-esteem and confidence indicators, holding constant classroom fixed effects. There is no statistically significant Dragon effect with the exception of column (2), where the estimated coefficient is small (1.3 percentage points, which corresponds to a 1.6 percent impact from the baseline of 77 percent), and barely significant. Panel B displays the regression results that control

for parent expectations and observable child and family attributes. The results underline two important points. First, parent expectations significantly influence children's expectations. Most of the five parent expectation variables are significant determinants of children's self-esteem and of their future expectations, and parent expectations variables are jointly significant in all six regressions. Second, the coefficient of the Dragon dummy is small and never statistically significant in panel B of Table 9. Thus, it is parents' expectations, but not having been born in the year of the Dragon that has an impact on children's self-esteem and on their expectations about their future. Dropping from the regressions all child and family attributes (e.g. child's sex and age, fathers' education and so on) did not alter the estimated coefficients or the standard errors of Dragon dummies in any of the outcomes analyzed. The same was true for models that dropped parent expectations. Taken together, these results reveal that Dragon zodiac facilitates the formation of parent expectations (Table 8); that parent expectations influence children's self-esteem and children's own expectations (Table 9), but that having been born in the year of the Dragon has no direct impact on children's self-esteem and confidence (Table 9).

Parents' Investment in Children

Parents' heightened expectations about their child's current success in school and about the child's achievements in the future can translate into devoting resources to the child. For example, parents may spend more time consulting teachers about their child, or they may be less likely to require their children to help with the chores around the house. Importantly, if parents' expectations about their child's future are related to the investment made in the child (the effort and the resources parents spend on their child), parent expectations would be positively related to the child's test scores. To investigate this hypothesis, we modified the midterm test score

regressions (displayed in Table 6) by including the variables that gauge parent expectations. Any change in the estimated value of the coefficient of the Dragon dummy in these regressions reveal information about the mechanism through which the Dragon dummy impact test scores. Specifically, given that parents of Dragon children have higher expectations of their children (see Table 8), to the extent that the Dragon dummy acts as a proxy for these expectations, including both the Dragon dummy and parent expectations as explanatory variables to the model to explain test scores should provide a coefficient of the dragon dummy that is smaller in magnitude in comparison to the models that excludes parent expectations.

The results are reported in Table 10. Compared to those reported in Table 6, the coefficients of the Dragon dummy variable are about half as large in the Chinese midterm score regression (column 2), 80 percent smaller in English midterm score regression (column 3) and it becomes negative in the Math score regression (column 1), and they are not different from zero in any of the three columns. This indicates that after controlling for parents' expectations, the Dragon zodiac no longer explains higher test scores of the Dragon kids. On the other hand, all five variables measuring parent expectations have positive and significant coefficients.

Consistent with Chinese cultural beliefs regarding the impact of the zodiacs, we argue that Dragon Parents' expectations of their children's success are formed when these children are born. Thus, these expectations pre-date any school outcomes, and they do not vary significantly over time. On the other hand, it could be the case that higher or lower test scores of the students would prompt the parents to modify their expectations about the student's future; i.e. test scores may shape parent expectations. To investigate the validity of such reverse causality between students' test scores and parental expectations, we replicate the analyses in Table 6 and Table 10 by employing data from the 2014-2015 wave of CEPS. The CEPS conducted a follow-up survey one

year later for all students who were in the 7th grade in the previous wave (2013-2014). Thus, we regress 8th grade test scores on parent expectation in the 7th grade. Because the 8th grade test scores cannot impact parents' expectations formed one year earlier, any potential bias due to reverse causality is not relevant in this specification. The results, reported in the Appendix Table A5, are consistent with those reported in Tables 6 and 10. Thus, they confirm the finding that parental expectations are the channel through which the “Dragon effect” works.²⁷

Table 11 presents the regression results that analyze whether parents of Dragon children in fact invest more in their children in comparison to other parents. The results reported in column (1) suggest that parents of Dragon kids are 1.4 percentage points (10 percent) more likely to take the initiative to actively contact their child's teachers 5 or more times in the current semester in comparison to other parents. The results in columns (2) and (3) indicate that parents of Dragon kids have a higher propensity to enroll their children in kindergarten and that they give more pocket money to their children. The dependent variables in columns (4) and (5) measure whether the child often spends time on house chores. The estimates suggest that Dragon kids are less likely to help parents on housework. Thus, the results of Table 11 reveal that parents of Dragon children invest more time and money in their offspring in comparison to other parents.

Child Height

Parents may also invest in their children in terms of nutrition. The data set contains no information about the food intake of children but there is information on the height of middle school students. Given the evidence that height in adolescence is strongly correlated with nutrition intake during childhood (see Case and Paxson 2008, Micklewright and Ismail 2001, and the

²⁷ Students who were previously in the 9th grade were not surveyed in the follow-up wave of the CEPS conducted in 2014-2015.

literature they cite) we ran regressions of height of middle school students on the Dragon dummy, controlling for the same set of explanatory variables as before, including the age of the student.²⁸ The results are displayed in Table 12. Column (1) shows that female students are about 6.4 cm shorter than males, but that being a female Dragon child has a positive impact on height. Specifically, having been born in the year of the Dragon helps reduce the female height gap by 2.7 centimeters. Columns (2) and (3) present the results by students' location of residence. The average height of rural students is 160.8 cm, whereas students in urban areas are 163.2 cm tall on average. Columns (2) and (3) reveal that the impact on height of being a female dragon child is larger in rural areas (3.3 cm vs. 1.9 cm), which is confirmed by the results presented in column (4). Thus, the results in Table 13 indicate that even though girls are six centimeters shorter than boys this height disadvantage is mitigated by having a Dragon zodiac. Specifically, if a female middle school student is born in the year of the Dragon, she is 2.7 cm taller than another female student of the same age. This is consistent with the hypothesis of allocation of additional nutritional resources to girls if they are born in the year of the Dragon. That this effect is larger in rural areas is also consistent with the hypothesis that food and nutrition may be driving this finding because investment in children in terms of food and nutrition should be more prevalent in rural, as opposed to urban areas.

Do Dragon Parents Invest in their Kids because of the Fear of Competition?

As Table 11 demonstrates, parents of middle school Dragon children invest more heavily in their kids in comparison to other parents. The assumption behind this finding is that the parents of Dragon children believe that their children are inherently more productive as suggested by the

²⁸ Nunn and Qian (2011) show that increased nutrition, related to the introduction of potato to France in the 18th century, increased the height of French soldiers born between 1658 and 1770.

superstition. Thus, an investment in these kids would produce higher returns in comparison to investment in other kids (by other parents). In other words, Dragon parents would invest more heavily in their kids as opposed to other parents because the return of their investment is higher. It can be argued, however, that parents do not believe that Dragon children are superior. That is, they prefer their kids to be born in a Dragon year for some other reason, but they don't actually think that Dragon kids are destined for greatness.²⁹ Yet, everyone recognizes that the Dragon cohorts are larger and therefore these Dragon children would be at a disadvantage unless additional resources are allocated to them to compensate for the intensity of competition they would face due to the large cohort size. In this scenario, Dragon parents invest in their children to counteract the drawback of their kids being a member of a large cohort. To investigate the validity of this conjecture, we focus exclusively on 7th grade students who are classmates. This subsample of middle school students consists of only those who were born in a Dragon year or in a Snake year. This cohort of the 7th graders is large because of the Dragon children; and the parents of the Snake children should also be aware of this fact. Thus, 7th grade parents whose children were born in the year of the Snake should be worried about the increased competition due to the large cohort size generated by the Dragon kids in the 7th grade, and these Snake parents are expected to invest in their kids as heavily as do the parents of the “competing” Dragon kids. This argument suggests that there should not be a significant difference between these two groups of parents in terms of investment in their offspring.

Appendix Table A6 presents the summary results of the analyses conducted in this sample of 7th graders. Panel A of Table A6 (which is the counterpart to Table 6) shows that Dragon children receive higher test scores in comparison to Snake children who are in the same grade.

²⁹ As discussed earlier, we show in the paper that Dragon parents have higher expectations of their children in comparison to other parents, refuting this claim.

Consistent with Table 9, Panel B of Table A6 shows that 7th grade Dragon children are not different from 7th grade Snake children (the left-out category in these regressions) in terms of their self-esteem, or about expectations for their own future.

Panel C of Table A6, which is the counterpart of Table 8, demonstrates that parents of Dragon children have higher expectations of their children in comparison to the parents of Snake children who are classmates of Dragon kids. The point estimates and statistical significance in Table 8 and Table A6-Panel C are almost identical despite the reduction in the sample size by half in the latter table.

Regressions reported in Panel D of Table A6 report models of test scores (as in Panel A). The difference between Panel A and Panel D is that, the latter regressions include parent expectations. Panel D reveals that holding constant parent expectations eliminates the “Dragon” effect from the test score regressions of the 7th graders (as was the case in the big sample of 7th and 9th graders—see Table 10). Finally, panel E of Table A6 shows that parents of Dragon kids in 7th grade classrooms invest more heavily in their kids in comparison to parents of the Snake kids in the same classrooms. This finding is inconsistent with the hypothesis that Dragon parents invest more in their kids because they want to compensate for the large cohort size in which their kids operate. This is because, the same argument applies to the Snake parents: the kids of the Snake parents too face intensified competition because of the large cohort size, inflated by Dragon kids. But panel E of Table A6 reveals that Dragon parents invest more in their kids in comparison to parents of kids with Snake zodiacs, and that the point estimates are very similar to those obtained from the big sample (of 7th and 9th grades) displayed in Table 11. Unless one is prepared to argue that parents of Snake children do not care about the success of their offspring, this finding refutes

the conjecture that Dragon parents invest in their kids because they are worried about the competition with a large number of students in the cohort.

Is this an Age Effect?

It could be argued that the Dragon students outperform the students who are born in the year of the Snake (although both types are in the same classroom) because Dragon students in the 7th grade are a few months older than their classmates who were born in the year of the Snake. If this were the case, however, one would observe the same age impact on test scores among other cohorts as well. Thus, we analyze the sample of 9th grade students which consists of only the Tiger and Rabbit cohorts. We regress the test scores on a dummy that indicates a student being born in the Tiger year. Although all students in this sample are in the 9th grade, those who were born in the year of the Tiger are a few months older than those born in the Rabbit year (see Figure 1). As shown in the Appendix Table A7, however, the Tiger dummy is not different from zero, indicating that test scores are not different between classmates who are either Rabbit or Tiger. This suggests that the results reported in Table A6 are not attributable to Dragon students being a few months older than their classmates in the 7th grade. Along the same lines, we examine if the parents of the Tiger students have higher expectations than the parents of the Rabbit students. As shown in Table A8, we again find no difference in parental expectations between the Tigers and Rabbits, indicating that the results are not an artifact of small age differences between students who are in the same grade.

V. Conclusion

In Chinese culture those who are born in a Dragon year are believed to be destined for good fortune and greatness. Because there is no biological reason for people who are born in a certain time period be more successful economically in comparison to those who are born in adjacent time periods, it is surprising that this superstition has persisted for many centuries.

If the cohort size of Dragon children is larger, this would intensify competition among children of that cohort in terms of educational resources. For example, class sizes in schools would be larger for kids born in Dragon years, which may reduce the quality of education they receive. Similarly, competition for a slot in a high-quality college could be more intense. If this is the case, and if children born in a Dragon year have worse educational outcomes in comparison to their peers who are similar in age and in other attributes, this would beg the question of how this particular belief about Dragon children being destined for good fortune greatness could persist.

Using three micro data sets from China we show that those born in a Dragon year have *better*, rather than worse, educational outcomes in comparison to similar individuals who are of the same age, or who are very similar in age, but who have different zodiac year designations. Those born in a Dragon year are more likely to have a college education, and they obtain higher scores at the university entrance exam. Similarly, Chinese middle school students have higher test scores if they are born in Dragon year. We show that these results are not because of family background, self-esteem or student's expectations about their own future. We find, however, that the "Dragon" effect on test scores is eliminated when we account for parents' expectations about their children's educational and professional success.

In all three data sets we find that parents of Dragon children are not different from other parents in terms of education of occupation, We find, however, that parents of Dragon children

have higher expectations for their children's educational success and their professional future in comparison to other parents, and that Dragon parents invest more heavily in their children in terms of time and money (the amount of pocket money parents give to the child, how many times parents talk to the child's teachers during the semester, whether the child is protected from doing chores at home, and so on). We also find that although female middle school students are about six centimeters shorter than male students of the same age, this height disadvantage is cut by about half by having a Dragon zodiac, and that this effect is larger in rural areas. This may suggest that parents may be allocating more food and nutrition to female Dragon children, especially in rural (and poorer) areas as a form of investment. A number of supplementary analyses demonstrate the robustness of these results.

It is possible that Dragon parents who believe in the superstition not only invest in their kids in the ways we measure in this paper (e.g. talking to the classroom teachers more frequently in the middle school, protecting their kids from doing house chores, etc.), but they also invest in other ways, such as by buying books and computers for their children, hiring tutors for them, and so on.³⁰ These potential additional investment avenues that may have also been utilized by parents do not alter the message of this paper: Even though children born in a Dragon year are no different from other children in the dimensions we observe in our data, ranging from family background to self-esteem, and expectations and aspirations about their future, Dragon students are more successful in school. This is because the parents of Dragon children have higher expectations of their children and they invest in their children more intensely. In the end, these higher expectations

³⁰ Dragon parent could have invested in their kids even before they were born, by consuming more health inputs during pregnancy (nutritious foods, prenatal care, etc.). While we cannot test whether birth weight is different between Dragon children and others, research indicates that the impact of birth weight on test scores and on educational attainment is modest (Figlio et al. 2014, Royer 2009, Rosenzweig and Zhang (2013). Furthermore, our middle school data set, which contains information on cognitive test scores, shows that there is no difference between Dragon kids and other kids in cognition, measured by this test.

yield better educational outcomes. Put differently, these expectations and the ensuing investment create this self-fulfilling prophecy.

Figure 1
The Order of Twelve Chinese Zodiacs



Figure 2
The Numbers of Live Births in China 1995-2014.

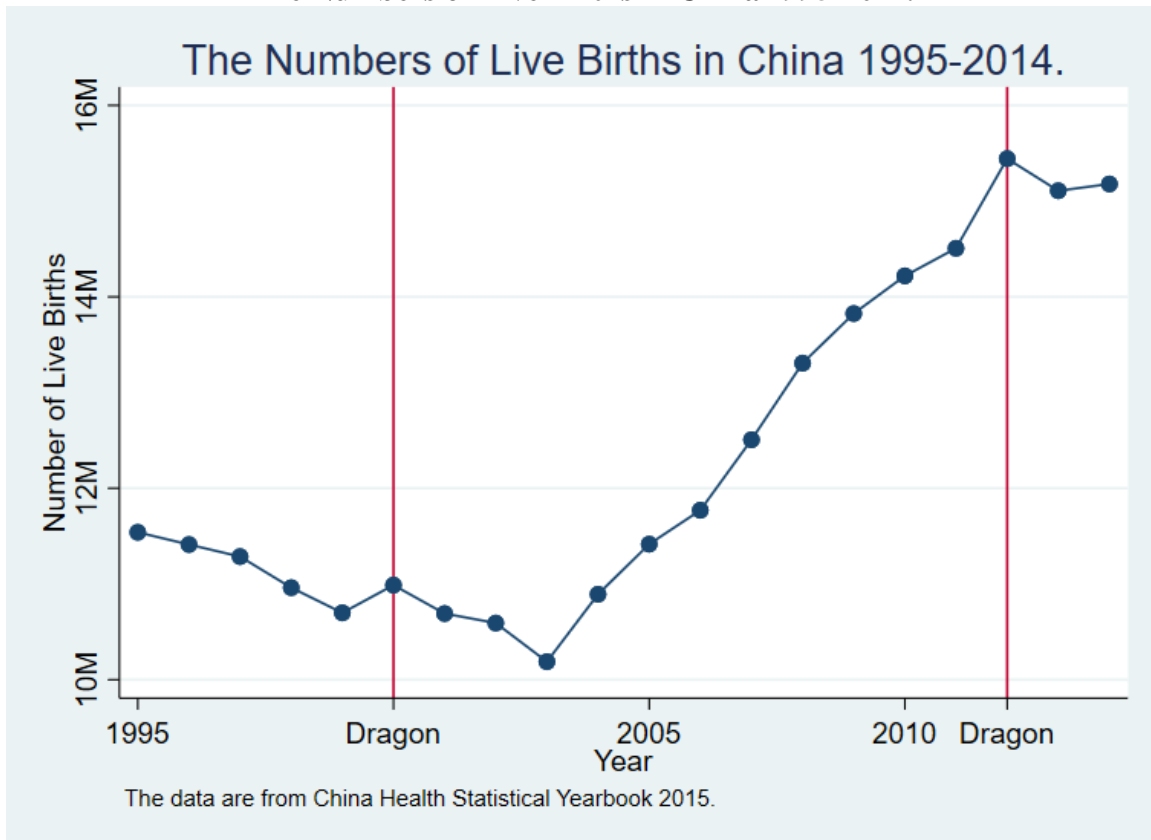


Figure 3
Proportion of Individuals with a Bachelor's Degree or Higher by Their Zodiacs
(Chinese General Social Survey Data)

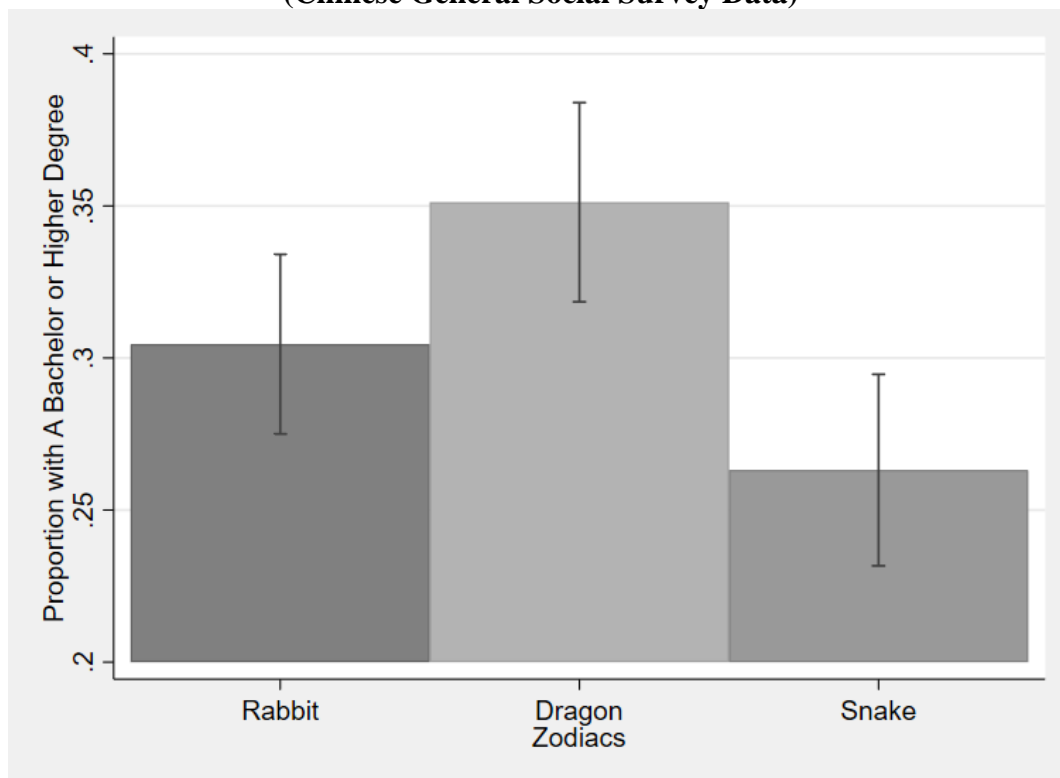


Figure 4
National College Entrance Exam Scores and Zodiacs
(Beijing College Students Survey Data)

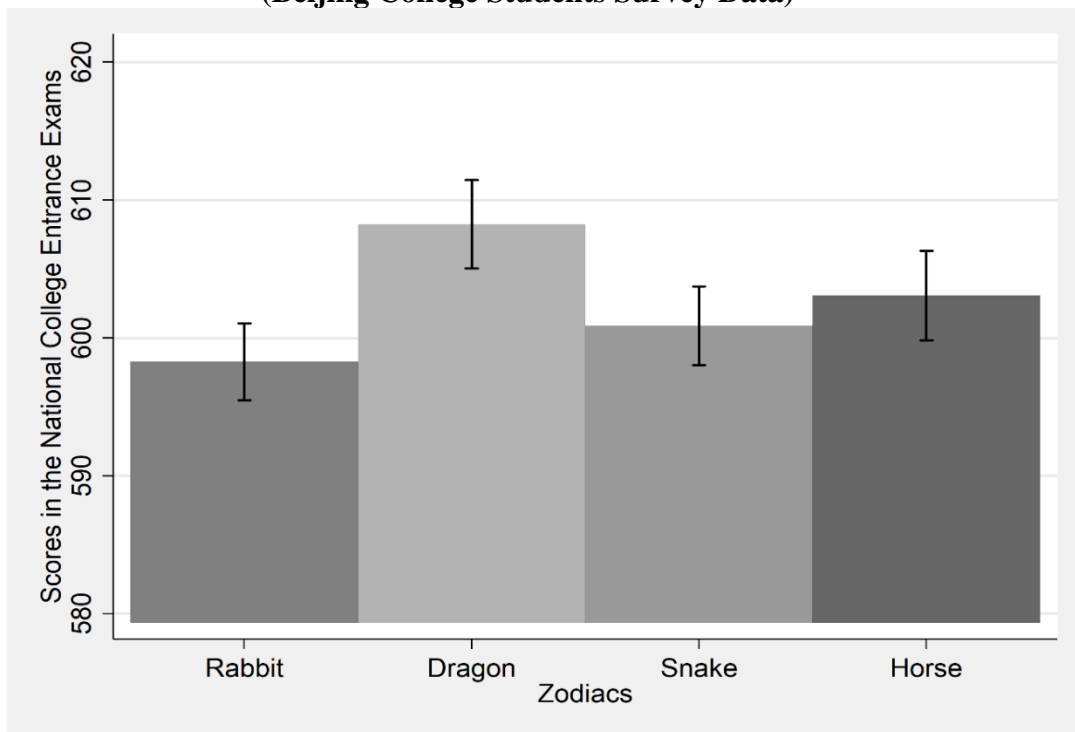


Figure 5
The Overlap between the Chinese Lunar Calendars, the Cycle of Zodiacs
and Academic Years

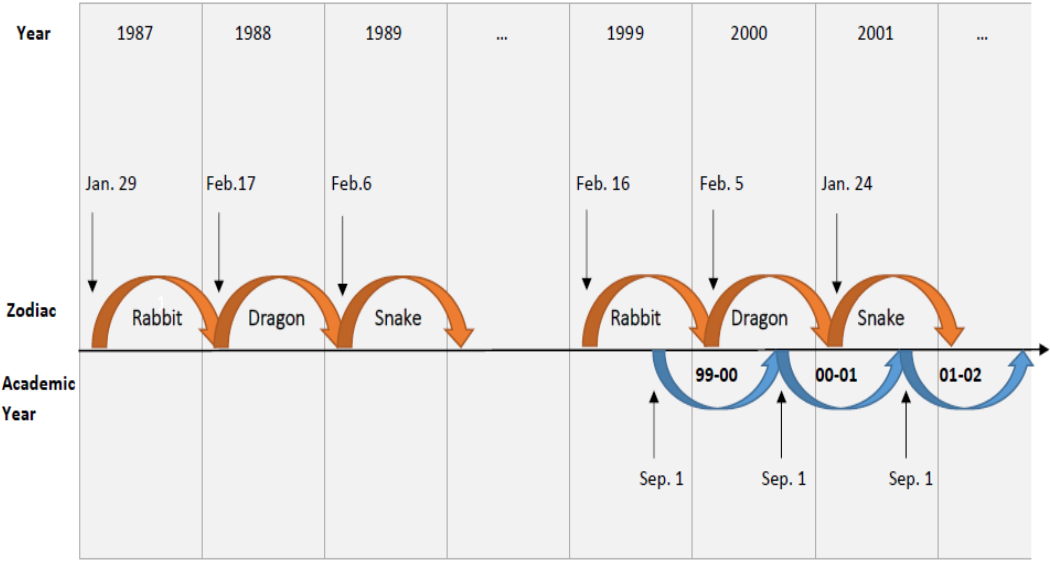


Table 1
Descriptive Statistics
Chinese General Social Survey Sample

Variables	Details	Dragon	Non-Dragon	Diff. of Mean (<i>p</i> -value)
Bachelor Degree or Above	Dummy variable (=1) if the respondent has a bachelor's degree or higher.	0.353 (0.478)	0.281 (0.449)	0.000
Age	Age of the respondent.	24.38 (1.74)	24.75 (2.71)	0.002
Female	Dummy variable (=1) if the respondent is female.	0.514 (0.500)	0.528 (0.499)	0.560
Minority	Dummy variable (=1) if the respondent belongs to a minority group in China.	0.082 (0.274)	0.102 (0.302)	0.141
Father Bachelor Degree or Above	Dummy variable (=1) if the respondent's father has at least a bachelor's degree.	0.074 (0.262)	0.069 (0.254)	0.662
Mother Bachelor Degree or Above	Dummy variable (=1) if the respondent's mother has at least a bachelor's degree.	0.042 (0.200)	0.041 (0.199)	0.979
N		552	3,283	

The sample consists of adults who were born between 1985 and 1991. Data are from Chinese General Social Survey waves 2010, 2012, 2013, and 2015. Regressions include parents' occupational characteristics not listed here. There is a total of 34 categories of occupations (17 for father and 17 for mother). These 17 categories are: 1. Employed by others (having a fixed employer); 2. full-time farmer; 3. Part-time farmer; 4. Contract employee/dispatched worker; 5. Casual worker (no fixed employer); 6. Working in family business, with salary; 7. Working in family business, no salary; 8. Freelance; 9. Individual business; 10. Owner or partner of a business; 11. Retired; 12. Unemployed; 13. Disabled; 14. In school without having a job; 15. Does housework; 16. Passed away; 17. Others.

Table 2
The Impact of Zodiacs on the Propensity of Having at Least a Bachelor's Degree
Chinese General Social Survey Sample

Variables	(1) Bachelor Degree or Above (born 1985-1991)	(2) Bachelor Degree or Above (born 1986-1990)	(3) Bachelor Degree or Above (born 1987-1989)
Dragon	0.07*** (0.02) [0.02]	0.06*** (0.02) [0.02]	0.06*** (0.02) [0.02]
Age	0.03*** (0.00)	0.03*** (0.01)	0.02 (0.01)
Female	0.03** (0.01)	0.03** (0.02)	0.06*** (0.02)
Minority	0.01 (0.03)	0.01 (0.03)	0.03 (0.04)
Father Bachelor Degree or Above	0.20*** (0.04)	0.21*** (0.04)	0.21*** (0.05)
Mother Bachelor Degree or Above	0.04 (0.05)	0.06 (0.06)	0.06 (0.08)
Parents' Occupation Attributes	Y	Y	Y
Wave Fixed Effects	Y	Y	Y
Province Fixed Effects	Y	Y	Y
Mean of the Dependent Variable	0.30	0.31	0.31
N	3,835	2,850	1,714

The sample includes individuals born between 1985 and 1991. The age of the respondents ranges from 19 to 30 in column 1. Standard errors, reported in (parentheses) are clustered at Dragon-by-city level. Robust standard errors are reported in [brackets]. *significant at 10%, ** significant at 5%, *** significant at 1%.

Table 3
Descriptive Statistics
Beijing College Students Survey Sample

Variables	Details	Mean	Std. Dev.	Mean	Std. Dev.
National College Entrance Exam Score	The student's score in the National College Entrance Exam in China.	602.7	49.94	602.48	50.21
Dragon	Dummy variable (=1) if the student's zodiac sign is Dragon.	0.23	0.42	0.23	0.42
Female	Dummy variable (=1) if the student is female.	0.47	0.50	0.47	0.50
Minority	Dummy variable (=1) if the student is from an ethnic minority in China.	0.12	0.32	0.11	0.32
Took Multiple Exams	Dummy variable (=1) if the student took the National College Entrance Exam multiple times.	0.10	0.31	0.10	0.30
Good Family Econ Status	Dummy variable (=1) if the family's economic status is better or much better than local average.			0.15	0.35
Father Bachelor Degree or Above	Dummy variable (=1) if the student's father has at least a bachelor's degree.			0.48	0.50
Mother Bachelor Degree or Above	Dummy variable (=1) if the student's mother has at least a bachelor's degree.			0.40	0.49
N		2,956		2,738	

Data are from Beijing College Student Study wave 2009. Two sets of descriptive statistics are reported for two analyses samples because family background attributes are not available for each respondent and the sample that includes family background variables is smaller (N=2,956 vs. N=2,738).

Table 4
The Impact of Zodiacs on the National College Entrance Exam Scores
Beijing College Students Survey Sample

Variables	(1) National College Entrance Exam Score	(2) National College Entrance Exam Score	(3) National College Entrance Exam Score (born 1987- 1989)	(4) National College Entrance Exam Score	(5) National College Entrance Exam Score	(6) National College Entrance Exam Score (born 1987-1989)
	Using Adjusted Dragon Dummy					
Dragon	10.50*** (2.28) [2.26]	8.80*** (1.89) [2.29]	9.12*** (1.87) [2.32]	10.36*** (2.12) [2.33]	8.38*** (1.67) [2.35]	8.67*** (1.58) [2.39]
Female	-7.11*** (1.01)	-8.49*** (1.32)	-8.22*** (1.27)	-7.06*** (1.00)	-8.43*** (1.30)	-8.14*** (1.25)
Minority	-8.02*** (1.87)	-6.11*** (1.76)	-6.52*** (1.59)	-8.00*** (1.88)	-6.10*** (1.75)	-6.51*** (1.58)
Took Multiple Exams	-0.22 (2.60)	1.83 (2.21)	2.64 (1.90)	-0.34 (2.62)	1.69 (2.20)	2.48 (1.87)
Good Family Econ Status		3.87 (3.18)	5.00 (3.85)		3.88 (3.15)	5.02 (3.82)
Father Bachelor Degree or Above		9.84*** (2.15)	8.04*** (2.42)		9.89*** (2.15)	8.10*** (2.44)
Mother Bachelor Degree or Above		7.55*** (1.41)	7.78*** (2.06)		7.47*** (1.42)	7.68*** (2.07)
Average Exam Score	602.69	602.48	602.16	602.69	602.48	602.16
Province Fixed Effects	Y	Y	Y	Y	Y	Y
N	2,956	2,738	2,029	2,956	2,738	2,029

The data are collected from the Beijing College Student Study wave 2009. Adjusted Dragon dummy takes the value of the proportion of days belonging to the “Dragon” year in that month. Standard errors, reported in (parentheses) are clustered at Dragon-by-city level. Robust standard errors are reported in [brackets]. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 5
Summary Statistics
China Education Panel Study Sample (Middle School Students)

Variables	Details	Mean	Std. Dev.	N
Test Score in Math	The student's mid-term exam score in the subject of Mathematics	81.57	30.59	13,309
Test Score in Chinese	The student's mid-term exam score in the subject of Chinese.	85.41	19.54	13,309
Test Score in English	The student's mid-term exam score in the subject of English.	82.27	29.71	13,309
<i>Student Characteristics</i>				
Dragon	Dummy variable (=1) if the student's zodiac is Dragon.	0.23	0.42	14,954
Female	Dummy variable (=1) if the student is female.	0.50	0.50	14,954
Age	Age of the student measured as the survey year minus the student's birth year.	13.88	1.33	14,954
Single Child	Dummy variable (=1) if the student is a single child.	0.45	0.50	14,954
<i>Students' Self-Esteem</i>				
Articulate	Dummy variable (=1) if the student believes that he/she can present his/her opinions clearly.	0.80	0.40	14,541
Fast Thinker	Dummy variable (=1) if the student believes that he/she reacts to things rapidly.	0.77	0.42	14,537
Quick Learner	Dummy variable (=1) if the student believes that he/she learns new knowledge quickly.	0.76	0.43	14,428
Wants Bachelor's Degree or Higher	Dummy variable (=1) if the student wants to obtain at least a bachelor's degree in the future.	0.67	0.47	14,954
Strong Career Ambition	Dummy variable (=1) if the student wants to become a leader or officer at national/government institutions, a scientist, an engineer or an executive in a company in the future.	0.36	0.48	14,926
Has Faith in the Future	Dummy variable (=1) if the student has faith in his/her own future.	0.86	0.35	14,954
<i>Parents' Attributes, Investments and Beliefs</i>				
Parents Expect Their Child to Obtain at Least a High School Diploma	Dummy variable (=1) if parents expect their child to obtain at least a high school degree.	0.93	0.25	13,764
Parents Expect Their Child to Obtain at Least a Bachelor's Degree	Dummy variable (=1) if parents expect their child to attain a college education or higher.	0.76	0.42	13,764
Parents have Strong Career Ambitions for Their Child	Dummy variable (=1) if parents hope that their child becomes a leader or officer at national/government institutions, a scientist, an engineer or an executive in a company in the future.	0.43	0.50	13,829
Parents Have Faith in Their Child's Future	Dummy variable (=1) if parents have faith in the child's future.	0.88	0.32	13,747
Parents Require Their Child to have Grades at least Higher than the Class Average	Dummy variable (=1) if parents require the kids' grades to be at least better than the class average.	0.73	0.45	13,769

Table 5 (continued)

Parents Contacted Teachers Spontaneously More than 5 Times This Semester	Dummy variable (=1) if parents contacted the teachers of their kid spontaneously more than 5 times during this semester.	0.14	0.34	13,739
Student Went to Kindergarten	Dummy variable (=1) if the student has attended kindergarten after 3 years of age.	0.81	0.39	13,765
Log (Weekly Pocket Money)	Logarithm of the average weekly pocket money the student receives from parents.	3.16	0.94	11,097
Student Helps Parents with Housework during the Holidays	Dummy variable (=1) if the student often helps parents with housework during the summer and/or winter holiday.	0.55	0.50	13,760
Student Helped Parents with Housework Last Week	Dummy variable (=1) if the student helped parents with housework (1-15 hours) every day during the last week.	0.38	0.48	13,506
Father Bachelor Degree or Higher	Dummy variable (=1) if the student's father has at least a bachelor's degree.	0.16	0.37	14,954
Mother Bachelor Degree or Higher	Dummy variable (=1) if the student's mother has at least a bachelor's degree.	0.13	0.34	14,954
Father White Collar	Dummy variable (=1) if the student's father has a white collar or better job.	0.19	0.39	14,954
Mother White Collar	Dummy variable (=1) if the student's mother has a white collar or better job.	0.14	0.35	14,954
<i>Family Income Status</i>				
Family Has High Income	Dummy variable (=1) if the student's family income is average or average above average, based on parents' perception.	0.06	0.24	14,954
Mother Answers the Parents' Survey	Dummy variable (=1) if the student's mother answers the survey questions on behalf of parents.	0.53	0.50	13,829

For the outcomes of parents' expectations, we only include parents who are biological parents of the students. Descriptive statistics of the students' type of *hukou* (certificate of residency) are not reported.

Table 6
The Impact of Dragon Zodiac on Mid-Term Test Scores in Middle School
China Education Panel Study Sample

Variables	(1) Test Score in Math	(2) Test Score in Chinese	(3) Test Score in English
Dragon	0.306 (0.443) [0.564]	0.695*** (0.222) [0.284]	0.924** (0.364) [0.460]
Female	1.525*** (0.463)	6.816*** (0.243)	11.031*** (0.437)
Age	-3.600*** (0.403)	-1.309*** (0.195)	-3.057*** (0.345)
Single Child	0.402 (0.521)	-0.090 (0.259)	0.927** (0.441)
Father Bachelor Degree or Above	4.680*** (0.832)	1.951*** (0.398)	4.131*** (0.695)
Mother Bachelor Degree or Above	3.328*** (0.754)	1.077*** (0.374)	3.592*** (0.635)
Father White Collar	0.526 (0.653)	0.479 (0.316)	0.461 (0.579)
Mother White Collar	-0.128 (0.679)	0.497 (0.346)	0.644 (0.655)
Family Has High Income	-1.950** (0.867)	-0.376 (0.420)	-1.253* (0.729)
Mother Answers the Parents' Survey	0.862** (0.437)	0.057 (0.224)	0.375 (0.385)
Average Mid-Term Exam Scores	81.57	85.41	82.27
Classroom Fixed Effects	Y	Y	Y
N	13,309	13,309	13,309

The age of the students ranges from 11 to 18. Regressions control for students' type of *hukou* (certificate of residency). Standard errors, reported in (parentheses) are clustered at Dragon-by-classroom level. Robust standard errors are reported in [brackets]. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 7
The Relationship between Being Born in a Dragon Year and Parent Attributes

Panel A:	Chinese General Social Survey Sample					
	(1)	(2)				
	Father Bachelor Degree or Above	Mother Bachelor Degree or Above				
Dragon	0.005 (0.022) [0.012]	0.000 (0.014) [0.009]				
<i>p-value</i>	0.813	0.987				
Dependent Mean	0.07	0.04				
N	3,835	3,835				
Panel B:	Beijing College Students Survey Sample					
	(1)	(2)	(3)			
	Father Bachelor Degree or Above	Mother Bachelor Degree or Above	Good Family Econ Status			
Dragon	0.023 (0.064) [0.023]	-0.019 (0.077) [0.022]	0.022 (0.021) [0.017]			
<i>p-value</i>	0.719	0.805	0.307			
Dependent Mean	0.48	0.40	0.15			
N	2,738	2,738	2,738			
Panel C:	China Education Panel Study Sample					
	(1)	(2)	(3)	(4)	(5)	(6)
	Father Bachelor Degree or Above	Mother Bachelor Degree or Above	Father White Collar	Mother White Collar	Family Has High Income	Single Child
Dragon	-0.012 (0.018) [0.007]	-0.005 (0.017) [0.007]	-0.001 (0.016) [0.008]	-0.010 (0.014) [0.007]	-0.003 (0.006) [0.005]	-0.014 (0.026) [0.010]
<i>p-value</i>	0.488	0.781	0.930	0.500	0.605	0.589
Dependent Mean	0.16	0.13	0.19	0.14	0.06	0.45
N	14,954	14,954	14,954	14,954	14,954	14,954

Standard errors, clustered at Dragon-by-city level in panels A and B, and at Dragon-by-classroom level in panel C, are in (parentheses). Robust standard errors are reported in [brackets]. *significant at 10%, ** significant at 5%, *** significant at 1%.

Table 8
Parents' Expectations of their Children
China Education Panel Study Sample

Variables	(1) Parents Expect Their Child to Obtain at Least a High School Diploma	(2) Parents Expect Their Child to Obtain at Least a Bachelor's Degree	(3) Parents Have Strong Career Ambitions for Their Child	(4) Parents Have Faith in Their Child's Future	(5) Parents Require Their Child to Have Grades at Least Higher than Class Average
Parent of a Dragon Child	0.017*** (0.005) [0.006]	0.024*** (0.007) [0.010]	0.032*** (0.009) [0.012]	0.006 (0.006) [0.008]	0.024*** (0.008) [0.011]
Female	0.019*** (0.004)	0.039*** (0.007)	-0.179*** (0.008)	0.024*** (0.006)	0.040*** (0.008)
Age	-0.021*** (0.004)	-0.051*** (0.006)	-0.023*** (0.007)	-0.019*** (0.005)	-0.041*** (0.006)
Single Child	0.010* (0.005)	0.025*** (0.009)	-0.022* (0.011)	-0.000 (0.007)	0.001 (0.010)
Mother Answers the Parents' Survey	0.002 (0.005)	0.010 (0.008)	-0.033*** (0.009)	-0.004 (0.006)	-0.006 (0.008)
Father Bachelor Degree or Above	0.020*** (0.005)	0.072*** (0.010)	0.000 (0.018)	-0.003 (0.009)	0.064*** (0.014)
Mother Bachelor Degree or Above	-0.000 (0.005)	0.015 (0.010)	-0.049*** (0.018)	0.025*** (0.009)	0.009 (0.017)
Father White Collar	-0.000 (0.005)	0.012 (0.010)	0.065*** (0.014)	0.010 (0.008)	0.012 (0.012)
Mother White Collar	0.007 (0.005)	0.033*** (0.009)	0.031* (0.016)	0.004 (0.009)	0.018 (0.013)
Family Has High Income	-0.008 (0.008)	-0.003 (0.014)	0.034* (0.020)	0.048*** (0.009)	-0.024 (0.016)
Mean of Dependent Variables	0.931	0.764	0.433	0.884	0.727
Classroom Fixed Effects	Y	Y	Y	Y	Y
N	13,764	13,764	13,829	13,747	13,769

The sample only includes biological parents of the students. Regressions control for student's type of *hukou* (certificate of residency). Standard errors, clustered at Dragon-by-classroom level are in (parentheses). P-values of the Dragon dummies, adjusted for multiple-hypothesis testing are 0.001, 0.003, 0.001, 0.266, and 0.004 for column 1 through 5, respectively. Robust standard errors are [brackets]. *significant at 10%, ** significant at 5%, *** significant at 1%.

Table 9
The Impact of Parental Expectations and the Dragon Zodiac on Students' Self-Esteem
China Education Panel Study Sample

Variables	(1) Articulate	(2) Faster Thinker	(3) Quick Learner	(4) Wants Bachelor's Degree or Higher	(5) Strong Career Ambition	(6) Has Faith for the Future
Panel A						
Dragon	0.010 (0.007) [0.009]	0.013* (0.008) [0.009]	-0.002 (0.008) [0.010]	-0.012 (0.007) [0.010]	0.011 (0.008) [0.011]	-0.007 (0.006) [0.007]
Panel B						
Dragon	0.006 (0.008) [0.010]	0.012 (0.008) [0.010]	-0.002 (0.008) [0.010]	-0.003 (0.007) [0.009]	0.003 (0.008) [0.010]	-0.001 (0.006) [0.007]
Female	0.040*** (0.007)	-0.071*** (0.007)	-0.022*** (0.008)	0.082*** (0.007)	-0.179*** (0.008)	-0.029*** (0.006)
Age	0.015*** (0.005)	-0.003 (0.005)	0.000 (0.006)	-0.007 (0.005)	-0.002 (0.006)	-0.012** (0.005)
Parents Expect Their Child to Obtain At Least a High School Diploma	-0.004 (0.018)	-0.000 (0.018)	0.070*** (0.017)	0.122*** (0.014)	0.019 (0.014)	0.013 (0.016)
Parents Expect Their Child to Obtain At Least a Bachelor's Degree	0.033*** (0.011)	0.031*** (0.010)	0.052*** (0.010)	0.334*** (0.012)	0.051*** (0.010)	0.037*** (0.009)
Parents Have Strong Career Ambitions for Their Child	0.009 (0.007)	0.012* (0.007)	0.016** (0.007)	0.024*** (0.007)	0.303*** (0.009)	-0.005 (0.006)
Parents Have Faith in Their Child's Future	0.074*** (0.012)	0.081*** (0.012)	0.092*** (0.014)	0.071*** (0.012)	0.027** (0.012)	0.229*** (0.013)
Parents Require Their Child to Have Grades at Least Higher than Class Average	0.009 (0.008)	0.042*** (0.009)	0.093*** (0.009)	0.175*** (0.009)	0.089*** (0.009)	0.065*** (0.007)
<i>Test for Joint Significance of Parent Expectations</i>						
F-Stat	12.90	21.60	60.54	519.46	345.91	105.35
p-value	0.000	0.000	0.000	0.000	0.000	0.000
Classroom Fixed Effects	Y	Y	Y	Y	Y	Y
N	14,357	14,352	14,246	14,763	14,736	14,762

The age of the students ranges from 11 to 18. Regressions control for students' type of hukou (certificate of residency). Panel A reports simple correlations with no control variables. Regressions in Panel B control for student and family attributes, as included in Table 6. Standard errors, reported in (parentheses) are clustered at Dragon-by-classroom level. Robust standard errors are reported in [brackets]. P-values of Dragon dummies, adjusted for multiple-hypothesis testing are 0.62, 0.47, 0.71, 0.51, 0.47, and 0.71 for column 1 through 6, respectively. *significant at 10%, ** significant at 5%, *** significant at 1%.

Table 10
The Impact of Dragon Zodiac on Mid-Term Test Scores in Middle School
Accounting for Parental Expectations -- China Education Panel Study Sample

Variables	(1) Test Score in Mathematics	(2) Test Score in Chinese	(3) Test Score in English
Dragon	-0.613 (0.399) [0.516]	0.300 (0.204) [0.264]	0.200 (0.326) [0.418]
Female	0.623 (0.413)	6.386*** (0.229)	10.154*** (0.409)
Age	-2.047*** (0.342)	-0.645*** (0.177)	-1.788*** (0.306)
Single Child	0.102 (0.460)	-0.231 (0.239)	0.679* (0.402)
Mother Answers the Parents' Survey	0.965*** (0.365)	0.091 (0.203)	0.443 (0.331)
Parents Expect Their Child to Obtain at Least a High School Diploma	9.368*** (1.018)	4.719*** (0.622)	5.942*** (0.895)
Parents Expect Their Child to Obtain at Least a Bachelor's Degree	9.007*** (0.664)	3.804*** (0.305)	7.621*** (0.557)
Parents Have Strong Career Ambitions for Their Child	1.950*** (0.398)	0.601*** (0.189)	0.904*** (0.339)
Parents Have Faith in Their Child's Future	7.535*** (0.687)	2.732*** (0.361)	6.485*** (0.581)
Parents Require Their Child to Have Grades Higher at Least Higher than Class Average	17.123*** (0.613)	7.410*** (0.309)	14.769*** (0.533)
Father Bachelor Degree or Above	2.777*** (0.734)	1.120*** (0.360)	2.537*** (0.634)
Mother Bachelor Degree or Above	2.986*** (0.711)	0.931*** (0.340)	3.267*** (0.577)
Father White Collar	0.014 (0.577)	0.281 (0.289)	0.069 (0.506)
Mother White Collar	-0.803 (0.633)	0.212 (0.331)	0.104 (0.596)
Family Has High Income	-1.948** (0.768)	-0.339 (0.389)	-1.243* (0.643)
Average Mid-Term Exam Scores	81.57	85.41	82.27
Classroom Fixed Effects	Y	Y	Y
N	13,309	13,309	13,309

The models control for a dummy variable which indicates who (father or mother) answered the parents' survey questions of parents' expectations. Regressions control for students' type of hukou (certificate of residency). Standard errors, reported in (parentheses) are clustered at Dragon-by-classroom level. Robust standard errors are in [brackets]. *significant at 10%, ** significant at 5%, *** significant at 1%.

Table 11
Parental Investment in Children
China Education Panel Study Sample

Variables	(1) Parents Contacted Teachers Spontaneously More than 5 Times This Semester	(2) Student Went to Kindergarten	(3) Log (Weekly Pocket Money)	(4) Student Helps Parents with Housework during Holidays	(5) Student Helped Parents with Housework Last Week
Parent of a Dragon Child	0.014** (0.007) [0.008]	0.033*** (0.007) [0.009]	0.050*** (0.018) [0.023]	-0.025*** (0.009) [0.012]	-0.027*** (0.009) [0.012]
Female	-0.051*** (0.006)	0.009 (0.006)	0.011 (0.017)	0.098*** (0.009)	0.026*** (0.008)
Age	-0.011** (0.005)	-0.050*** (0.006)	0.020 (0.013)	0.006 (0.007)	0.035*** (0.007)
Single Child	-0.002 (0.008)	0.024*** (0.008)	-0.044** (0.020)	-0.057*** (0.011)	-0.036*** (0.010)
Mother Answers the Parents' Survey	-0.000 (0.006)	0.014** (0.007)	-0.079*** (0.018)	-0.008 (0.009)	-0.017** (0.008)
Father Bachelor Degree or Above	0.025** (0.012)	-0.009 (0.010)	-0.104*** (0.032)	0.003 (0.016)	-0.027* (0.014)
Mother Bachelor Degree or Above	0.033*** (0.013)	0.007 (0.011)	0.023 (0.036)	-0.001 (0.017)	0.001 (0.015)
Father White Collar	0.019* (0.010)	0.006 (0.010)	0.042 (0.029)	-0.015 (0.014)	-0.000 (0.013)
Mother White Collar	0.028*** (0.011)	0.008 (0.010)	-0.006 (0.034)	-0.018 (0.015)	-0.000 (0.015)
Family Has High Income	0.024* (0.013)	0.012 (0.012)	0.429*** (0.039)	-0.016 (0.018)	0.018 (0.017)
Mean of Dependent Variable	0.136	0.813	3.164	0.545	0.378
Classroom Fixed Effects	Y	Y	Y	Y	Y
N	13,739	13,765	11,097	13,760	13,506

The sample only includes biological parents of the students. Regressions control for students' type of *hukou* (certificate of residency). Standard errors, reported in (parentheses) are clustered at Dragon-by-classroom level. Robust standard errors are in [brackets]. *significant at 10%, ** significant at 5%, *** significant at 1%.

Table 12
The Impact of Dragon Zodiac on Middle School Students' Height
China Education Panel Study Sample

VARIABLES	(1) Height (Full Sample)	(2) Height (Rural)	(3) Height (Urban)	(4) Height (Full Sample)
Dragon	-0.384* (0.229) [0.258]	-0.483 (0.300) [0.353]	-0.156 (0.352) [0.392]	-0.268 (0.339) [0.365]
Female	-6.446*** (0.223)	-6.065*** (0.278)	-6.776*** (0.305)	-6.780*** (0.289)
Rural	-0.807*** (0.152)			-1.231*** (0.251)
Female*Dragon	2.722*** (0.347) [0.291]	3.329*** (0.425) [0.408]	1.920*** (0.506) [0.438]	1.987*** (0.487) [0.425]
Rural*Dragon				-0.225 (0.449)
Rural*Female				0.632* (0.333)
Rural*Female*Dragon				1.432** (0.587)
Mean of Height	161.92	160.82	163.18	161.92
Classroom Fixed Effects	Y	Y	Y	Y
N	13,309	7,091	6,218	13,309

The dependent variable is the height of students measured in centimeters. A full set of covariates, as in Table 6, is included in all regressions. Standard errors, reported in (parentheses) are clustered at Dragon-by-classroom level. The numbers in [brackets] are robust standard errors. *significant at 10%, ** significant at 5%, *** significant at 1%

References

- Alesina, Alberto and Fuchs-Schündeln, Nicola, 2007. “Goodbye Lenin (or Not?): The Effect of Communism on People's Preferences”, *American Economic Review*, vol. 97, pp. 1507-1528.
- Alesina, Alberto and Giuliano, Paola, 2011. “Family Ties and Political Participation”, *Journal of the European Economic Association*, vol. 9, pp. 817-839.
- Bénabou, Roland, 2015. “The Economics of Motivated Beliefs”, *Revue d'Economie Politique*, vol. 125, pp. 665-685.
- Bénabou, Roland and Tirole, Jean, 2016. “Mindful Economics: The Production, Consumption, and Value of Beliefs”, *The Journal of Economic Perspectives*, vol. 30, pp. 141-164.
- Benjamini, Yoav and Yekutieli, Daniel, 2001. “The Control of the False Discovery Rate in Multiple Testing under Dependency”, *The Annals of Statistics*, vol. 29, pp. 1165-1188.
- Bharadwaj, Prashant, Eberhard, Juan Pedro and Neilson, Christopher A., 2018. “Health at Birth, Parental Investments, and Academic Outcomes”, *Journal of Labor Economics*, vol. 36, pp. 349-394.
- Brunello, Giorgio, Paola, Maria, and Scoppa, Vincenzo, 2010. “Peer Effects in Higher Education: Does the Field of Study Matter?” *Economic Inquiry*, vol. 48, pp. 621-634.
- Case, Anne and Paxson, Christina, 2008. “Stature and Status: Height, Ability, and Labor Market Outcomes”, *Journal of Political Economy*, vol. 116, pp. 499-532.
- Cook, Justin C. and Fletcher, Jason M., 2015. “Understanding Heterogeneity in the Effects of Birth Weight on Adult Cognition and Wages”, *Journal of Health Economics*, vol. 41, pp. 107-116.
- Di Tella, Rafael, Galiani, Sebastian and Schargrodsky, Ernesto, 2007. “The Formation of Beliefs: Evidence from the Allocation of Land Titles to Squatters”, *The Quarterly Journal of Economics*, vol. 122, pp. 209-241.
- Do, Quy-Toan and Phung, Tung D., 2010. “The Importance of Being Wanted”, *American Economic Journal: Applied Economics*, vol. 2, pp. 236-253.
- Fernandez, Raquel, and Fogli, Alessandra, 2009. “Culture: An Empirical Investigation of Beliefs, Work, and Fertility”, *American Economic Journal: Macroeconomics*, vol. 1, pp. 146-177.
- Figlio, David, Guryan, Jonathan, Karbownik, Krzysztof and Roth, Jeffrey, 2014. “The Effects of Poor Neonatal Health on Children's Cognitive Development”, *The American Economic Review*, vol. 104, pp. 3921-3955.
- Goodkind, Daniel M., 1991. “Creating New Traditions in Modern Chinese Populations: Aiming for Birth in the Year of the Dragon”, *Population and Development Review*, vol. 17, pp. 663-686.
- Guiso, Luigi, Sapienza, Paola, and Zingales, Luigi, 2008. “Social Capital as Good Culture”, *Journal of the European Economic Association*, vol. 6, pp. 295-320.
- Guiso, Luigi, Sapienza, Paola, and Zingales, Luigi, 2009. “Cultural Biases in Economic Exchange?”, *The Quarterly Journal of Economics*, vol. 124, pp. 1095-1131.
- Hanushek, Eric A., Kain, John F., and Rivkin, Steven G., 2009. “New Evidence about Brown V. Board of Education: The Complex Effects of School Racial Composition on Achievement”, *Journal of Labor Economics*, vol. 27, pp. 349-383.
- Johnson, Noel D. and Nye, John V.C., 2011. “Does Fortune Favor Dragons?”, *Journal of Economic Behavior & Organization*, Vol.78, pp. 85-97.

- Lau, Yan. 2019. "The Dragon Cohort of Hong Kong: Traditional beliefs, Demographics and Education" *Journal of Population Economics*, 32: 219-246.
- Lavy, Victor, Paserman, M. Daniele, and Schlosser, Analia, 2012. "Inside the Black Box of Ability Peer Effects: Evidence from Variation in the Proportion of Low Achievers in the Classroom", *The Economic Journal*, vol. 122, pp. 208-237.
- Li, Zhonglu, 2016. "Family Background, Academic Performance and Admission to Postgraduate Study in China", *Chinese Journal of Sociology* (a Chinese Journal), vol. 36, pp. 86-109.
- Lim Jaegeum, and Meer, Jonathan, 2017. "The Impact of Teacher-Student Gender Matches: Random Assignment Evidence from South Korea", *Journal of Human Resources*, Forthcoming.
- Micklewright, John and Ismail, Suraiya, 2001. "What Can Child Anthropometry Reveal About Living Standards and Public Policy? An Illustration from Central Asia", *Review of Income and Wealth*, vol. 47, pp. 65-80.
- Mocan, Naci, Samantha Bielen and Wim Marneffe, 2020. "Quality of Judicial institutions, Crimes, Misdemeanors, and Dishonesty," *European Journal of Political Economy*. 61.
- Mocan, Naci. 2019. "Taxes and Culture of Leisure: Impact on Labor Supply in Europe." *Journal of Comparative Economics*. Vol. 47, pp. 618-639.
- Mocan, Naci and Raschke, Christian, 2016. "Economic Well-being and Anti-Semitic, Xenophobic, and Racist Attitudes in Germany", *European Journal of Law and Economics*, vol. 41, pp. 1-63.
- Newcombe, Rhiannon, Milne, Barry J., Caspi, Avshalom, Poulton, Richie and Moffitt, Terrie E., 2007. "Birthweight Predicts IQ: Fact or Artefact?", *Twin Research and Human Genetics*, vol. 10, pp. 581-586.
- Newson, Roger B., 2010. "Frequentist Q-Values for Multiple-Test Procedures", *The Stata Journal*, vol. 10, pp. 568-584.
- Nunn, Nathan and Sanchez de la Sierra, Raul, 2017. "Why Being Wrong Can Be Right: Magical Warfare Technologies and the Persistence of False Beliefs", *American Economic Review: Papers & Proceedings*, vol. 107, pp. 582-587.
- Nunn, Nathan and Qian, Nancy, 2011. "The Potato's Contribution to Population and Urbanization: Evidence From A Historical Experiment", *The Quarterly Journal of Economics*, Vol. 126, pp. 593-650.
- Rosenzweig, Mark and Zhang, Junsen, 2013. "Economic Growth, Comparative Advantage, and Gender Differences in Schooling Outcomes: Evidence from the Birthweight Differences of Chinese Twins", *Journal of Development Economics*, vol. 104, pp. 245-260.
- Royer, Heather, 2009. "Separated at Girth: US Twin Estimates of the Effects of Birth Weight", *American Economic Journal: Applied Economics*, vol. 1, pp. 49-85.
- Sim, Nicholas, 2015. "Astronomics in Action: The Graduate Earnings Premium and the Dragon Effect in Singapore", *Economic Inquiry*, vol. 53, pp. 922-939.
- Suen, Wing, 2004. "The Self-Perpetuation of Biased Beliefs", *The Economic Journal*, vol. 114, pp. 377-396.
- Vere, James P., 2008. "Dragon Children: Identifying the Causal Effect of the First Child on Female Labor Supply with the Chinese Lunar Calendar", *Oxford Bulletin of Economics and Statistics*, vol. 70, pp. 303-325.
- Voigtländer, Nico and Voth, Hans-Joachim, 2012. "Persecution Perpetuated: The Medieval Origins of Anti-Semitic Violence in Nazi Germany", *The Quarterly Journal of Economics*, vol. 127, pp. 1339-1392.

- Wong, Ka-Fu and Yung, Linda, 2005. "Do Dragons Have Better Fate?", *Economic Inquiry*, vol. 43, pp. 689-697.
- Ye, Hua, 2015. "Key-Point Schools and Entry into Tertiary Education in China", *Chinese Sociological Review*, vol. 47, pp. 128-153.
- Yip, Paul S.F., Lee, Joseph and Cheung, Y.B., 2002. "The Influence of the Chinese Zodiac on Fertility in Hong Kong SAR", *Social Science & Medicine*, vol. 55, pp. 1803-1812.

Appendix

Table A1
The Impact of Zodiacs on Marriages and Live Births in Chinese Provinces

	(1)	(2)	(3)	(4)
	Marriages	Marriages	Log (Live Births)	Log (Live Births)
Tiger year		1.844*** [0.000]		-0.005 [0.654]
Rabbit year		2.142*** [0.000]		0.015 [0.183]
Dragon year	0.655 [0.211]	0.957* [0.085]	0.046*** [0.000]	0.050*** [0.000]
Province-Specific Linear Trends	Y	Y	Y	Y
Province Fixed Effects	Y	Y	Y	Y
N	968	968	319	319

In columns 1 and 2 the outcome is the number of marriages approved by the government annually per 10,000 population. Data in columns (1) and (2) span the years 1979 to 2013. The data used in regressions reported in columns (3) and (4) span the years 2003 to 2013. The mean value of log live births is 12.67. All regressions include provincial GDP. In column 3 and 4, the number of newly approved marriages are also included as a covariate. *P*-values are reported in [brackets], and they pertain to bootstrapped standard errors clustered at the province level.

*significant at 10%, ** significant at 5%, *** significant at 1%.

Table A2
The Impact of Dragon Zodiac on Mid-Term Test Scores in Middle School
CEPS Data-- Using the Adjusted Dragon Dummy

Variables	(1) Test Score in Mathematics	(2) Test Score in Chinese	(3) Test Score in English
Dragon (Adjusted)	0.394 (0.474) [0.596]	0.764*** (0.238) [0.300]	1.005** (0.390) [0.486]
Female	1.525*** (0.463)	6.817*** (0.243)	11.032*** (0.437)
Age	-3.616*** (0.409)	-1.326*** (0.198)	-3.079*** (0.349)
Single Child	0.402 (0.521)	-0.090 (0.259)	0.927** (0.441)
Father Bachelor Degree or Above	4.681*** (0.832)	1.951*** (0.398)	4.131*** (0.695)
Mother Bachelor Degree or Above	3.326*** (0.754)	1.076*** (0.374)	3.591*** (0.635)
Father White Collar	0.526 (0.653)	0.478 (0.316)	0.460 (0.579)
Mother White Collar	-0.128 (0.679)	0.497 (0.346)	0.644 (0.656)
Family Has High Income	-1.950** (0.867)	-0.374 (0.420)	-1.251* (0.729)
Mother Answers the Parents' Survey	0.862** (0.437)	0.056 (0.224)	0.374 (0.385)
Average Mid-Term Exam Scores	81.57	85.41	82.27
Classroom Fixed Effects	Y	Y	Y
N	13,309	13,309	13,309

Regressions control for students' type of *hukou* (certificate of residency). Adjusted Dragon dummy which takes the value of the proportion of days belonging to the "Dragon" year in that month. Standard errors are clustered at the Dragon-by-classroom level and reported in (parentheses). Robust standard errors are in [brackets]. *significant at 10%, ** significant at 5%, *** significant at 1%.

Table A3
The Impact of Dragon Zodiac on Mid-Term Test Score Rankings in Middle School
China Education Panel Study Sample

Variables	(1) Rank in Math	(2) Rank in Chinese	(3) Rank in English
Dragon	-0.000 (0.007) [0.007]	0.014** (0.007) [0.007]	0.011* (0.007) [0.007]
Female	0.021*** (0.006)	0.174*** (0.005)	0.159*** (0.006)
Age	-0.042*** (0.005)	-0.031*** (0.004)	-0.044*** (0.005)
Single Child	0.006 (0.007)	0.003 (0.007)	0.014** (0.006)
Father Bachelor Degree or Above	0.054*** (0.010)	0.048*** (0.010)	0.051*** (0.009)
Mother Bachelor Degree or Above	0.041*** (0.011)	0.032*** (0.010)	0.061*** (0.010)
Father White Collar	0.018** (0.008)	0.013* (0.008)	0.016** (0.008)
Mother White Collar	0.000 (0.009)	0.012 (0.008)	0.008 (0.009)
Family Has High Income	-0.012 (0.011)	-0.010 (0.009)	-0.013 (0.010)
Mother Answers the Parents' Survey	0.006 (0.005)	-0.002 (0.005)	0.007 (0.005)
Average Mid-Term Exam Scores	81.57	85.41	82.27
Block Fixed Effects	Y	Y	Y
N	13,309	13,309	13,309

Dependent variables are students' rankings in Mathematics, Chinese, and English mid-term exam scores.

The ranks are constructed within blocks (school \times grade) using $Rank_{i,b} = \frac{RawRank_{i,b}-1}{N_b-1}$ where

$RawRank_{i,b}$ and N_b are the raw rank of student i in school-grade block b and the total number of students in block b , respectively. Students' raw ranks (based on the test scores) range from 0 to N_b , where 0 stands for the lowest rank and N_b stands for the highest. Therefore, students' objective percentile ranks are approximately uniformly distributed from 0 to 1 indicating the lowest rank to the highest. Students with the same test score in the same block are assigned the same rank. Standard errors are clustered at Dragon-by-block level and reported in (parentheses). Robust standard errors are in [brackets]. *significant at 10%, ** significant at 5%, *** significant at 1%.

Table A4
The Impact of Dragon Zodiac on Standardized Test Scores in Middle School
China Education Panel Study Sample

Variables	(1) Std. Scores in Mathematics	(2) Std. Scores in Chinese	(3) Std. Scores in English
Dragon	-0.003 (0.022) [0.024]	0.043* (0.022) [0.023]	0.045** (0.022) [0.023]
Female	0.084*** (0.020)	0.562*** (0.018)	0.528*** (0.020)
Age	-0.146*** (0.016)	-0.103*** (0.015)	-0.150*** (0.016)
Single Child	0.039* (0.022)	0.008 (0.022)	0.063*** (0.022)
Father Bachelor Degree or Above	0.184*** (0.033)	0.138*** (0.033)	0.165*** (0.030)
Mother Bachelor Degree or Above	0.138*** (0.036)	0.104*** (0.033)	0.165*** (0.029)
Father White Collar	0.038 (0.026)	0.052** (0.025)	0.034 (0.027)
Mother White Collar	-0.009 (0.030)	0.028 (0.028)	0.022 (0.028)
Family Has High Income	-0.073** (0.037)	-0.030 (0.031)	-0.053* (0.032)
Mother Answers the Parents' Survey	0.028* (0.017)	-0.000 (0.017)	0.017 (0.016)
Block Fixed Effects	Y	Y	Y
N	13,309	13,309	13,309

Dependent variables are students' standardized test scores in Mathematics, Chinese, and English. The test scores are standardized within blocks (school \times grade cells). Standard errors are clustered at Dragon-by-block level and reported in (parentheses). Robust standard errors are in [brackets]. *significant at 10%, ** significant at 5%, *** significant at 1%.

Table A5
The Impact of Dragon Zodiac on Mid-Term Test Scores in the 8th Grade
Accounting for Parental Expectations in the 7th Grade -- CEPS Sample

Variables	(1) Test Score in Mathematics	(2) Test Score in Chinese	(3) Test Score in English
Panel A: Without Controlling for Parental Expectations			
Dragon	0.571 (0.647) [0.772]	0.745** (0.318) [0.416]	1.158** (0.506) [0.623]
N	6,463	6,463	6,461
Panel B: Controlling for Parental Expectations			
Dragon	-0.397 (0.616) [0.732]	0.303 (0.303) [0.394]	0.393 (0.475) [0.584]
N	6,463	6,463	6,461

The models control for a full set of covariates as in the main analyses using the CEPS data. Dependent variables are scores in math, Chinese, and English mid-term tests in the 8th grade. Standard errors are clustered at the Dragon-by-classroom level and reported in (parentheses). Robust standard errors are in [brackets]. *significant at 10%, ** significant at 5%, *** significant at 1%.

Appendix Table A6
Analyses of Middle School Students—Grade 7 Students Only
China Education Panel Study Sample

Panel A:	(1)	(2)		(3)		
	Test Score in Math	Test Score in Chinese		Test Score in English		
Dragon	0.311	0.826***		1.311***		
	(0.531)	(0.283)		(0.424)		
Dependent Mean	80.30	81.33		85.98		
N	6,760	6,760		6,760		
Panel B:	(1)	(2)	(3)	(4)	(5)	(6)
	Articulate	Faster Thinker	Quick Learner	Wants Bachelor or Higher Degree	Strong Career Ambition	Has Faith for the Future
Dragon	0.014	0.017	0.005	0.018	0.013	0.006
Adjusted p-value	[0.183]	[0.170]	[0.622]	[0.170]	[0.343]	[0.430]
Dependent Mean	0.810	0.792	0.774	0.680	0.352	0.898
N	7,402	7,400	7,332	7,625	7,618	7,625
Panel C:	(1)	(2)	(3)	(4)	(5)	
	Parents Expect Their Child to Obtain at Least a High School Diploma	Parents Expect Their Child to Obtain at Least a Bachelor's Degree	Parents Have Strong Career Ambitions for Their Child	Parents Have Faith in Their Child's Future	Parents Require Their Child to Have Grades at Least Higher than Class Average	
Dragon	0.022***	0.025***	0.034***	0.003	0.030***	
Adjusted p-value	[0.000]	[0.008]	[0.001]	[0.685]	[0.004]	
Dependent Mean	0.940	0.796	0.423	0.898	0.765	
N	6,959	6,959	7,002	6,954	6,964	
Panel D:	(1)	(2)		(3)		
	Test Score in Math	Test Score in Chinese		Test Score in English		
Dragon	-0.655	0.366		0.543		
	(0.495)	(0.258)		(0.389)		
Dependent Mean	80.30	81.33		85.98		
N	6,760	6,760		6,760		
Panel E:	(1)	(2)	(3)	(4)	(5)	
	Parents Contacted Teachers Spontaneously More than 5 Times This Semester	Student Went to Kindergarten	Log (Weekly Pocket Money)	Student Helps Parents with Housework during the Holidays	Student Helped Parents with Housework Last Week	
Dragon	0.013	0.032***	0.050**	-0.011	-0.027***	
	(0.008)	(0.009)	(0.021)	(0.010)	(0.010)	
Dependent Mean	0.128	0.827	2.978	0.548	0.404	
N	6,950	6,968	5,504	6,955	6,824	

The working samples are restricted to the 7th grade students. A full set of covariates are controlled for in all regressions. Panel A corresponds to Table 6. Panel B corresponds to Panel B of Table 9. Panels C, D and E correspond to tables 8, 10, and 11, respectively. Standard errors reported in the parentheses are clustered at Dragon-by-classroom level in Panel A, D, and E. Adjusted *p*-values for multiple-hypothesis testing using the Simes adjustment are reported for Panel B and C. *significant at 10%, ** significant at 5%, *** significant at 1%.

Appendix Table A7
Test Scores of Tigers and Rabbits -- Grade 9 Students Only
China Education Panel Study Sample

Variables	(1) Test Score in Mathematics	(2) Test Score in Chinese	(3) Test Score in English
Tiger	-0.233 (0.717) [0.699]	0.517 (0.354) [0.346]	0.394 (0.635) [0.604]
Female	1.446* (0.741)	7.032*** (0.393)	11.871*** (0.699)
Age	-3.095*** (0.603)	-1.056*** (0.288)	-2.325*** (0.528)
Single Child	0.214 (0.861)	-0.572 (0.422)	0.254 (0.717)
Father Bachelor Degree or Above	6.285*** (1.441)	3.509*** (0.655)	5.959*** (1.245)
Mother Bachelor Degree or Above	4.088*** (1.210)	0.930 (0.603)	4.268*** (1.080)
Father White Collar	2.241** (1.100)	1.423*** (0.518)	1.924* (0.999)
Mother White Collar	0.406 (1.162)	1.172** (0.588)	1.832 (1.223)
Family Has High Income	-1.164 (1.339)	-0.423 (0.669)	-1.196 (1.158)
Mother Answers the Parents' Survey	1.133* (0.684)	0.377 (0.356)	0.534 (0.641)
Classroom Fixed Effects	Y	Y	Y
N	6,549	6,549	6,549

Dependent variables are scores in Mathematics, Chinese and English on mid-term tests. Regressions control for students' type of *hukou* (certificate of residency). Standard errors are clustered at Dragon-by-classroom level and reported in (parentheses). Numbers in [brackets] are robust standard errors. *significant at 10%, ** significant at 5%, *** significant at 1%.

Table A8
Parents' Expectations of Children
Grade 9 Students and Tiger & Rabbit Zodiacs Only (CEPS Sample)

Variables	(1) Parents Expect Their Child to Obtain at Least a High School Diploma	(2) Parents Expect Their Child to Obtain at Least a Bachelor's Degree	(3) Parents Have Strong Career Ambitions for Their Child	(4) Parents Have Faith in Their Child's Future	(5) Parents Require Their Child to at Least Have Grades at Least Higher than Class Average
Parent of a Tiger Child	0.000 (0.007) [0.007]	-0.011 (0.013) [0.011]	0.004 (0.013) [0.013]	-0.010 (0.009) [0.009]	0.001 (0.012) [0.012]
Female	0.022*** (0.007)	0.036*** (0.011)	-0.166*** (0.012)	0.021** (0.010)	0.028** (0.012)
Age	-0.016*** (0.006)	-0.042*** (0.010)	-0.021** (0.010)	-0.021*** (0.007)	-0.033*** (0.009)
Single Child	0.006 (0.008)	0.017 (0.013)	-0.018 (0.016)	-0.001 (0.010)	-0.003 (0.015)
Mother Answers the Parents' Survey	0.006 (0.007)	0.028** (0.012)	-0.035*** (0.013)	-0.011 (0.009)	0.000 (0.012)
Father Bachelor Degree or Above	0.022*** (0.008)	0.087*** (0.016)	-0.012 (0.026)	0.004 (0.014)	0.100*** (0.020)
Mother Bachelor Degree or Above	-0.006 (0.009)	-0.005 (0.016)	-0.036 (0.026)	0.013 (0.015)	0.033 (0.026)
Father White Collar	0.007 (0.008)	0.026* (0.015)	0.102*** (0.020)	0.014 (0.012)	0.037* (0.019)
Mother White Collar	0.017** (0.008)	0.060*** (0.015)	0.021 (0.027)	0.019 (0.015)	0.032 (0.020)
Family Has High Income	-0.003 (0.012)	0.002 (0.020)	0.052* (0.027)	0.056*** (0.012)	-0.046* (0.024)
Classroom Fixed Effects	Y	Y	Y	Y	Y
N	6,805	6,805	6,792	6,793	6,805

The working sample only includes students born in the Tiger and Rabbit years. Regressions control for student's type of *hukou* (certificate of residency). Standard errors are clustered at Dragon-by-classroom level and reported in (parentheses). Robust standard errors are in [brackets].

*significant at 10%, ** significant at 5%, *** significant at 1 % or better.