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Auspicious birth dates among Chinese in California

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ABSTRACT

The number eight is considered lucky in Chinese culture, e.g. the Beijing Olympics began at 8:08 pm on 8/8/2008. Given the potential for discretion in selecting particular dates of labor induction or scheduled Cesarean section (C-section), we consider whether Chinese-American births in California occur disproportionately on the 8th, 18th, or 28th day of the month. We find 2.3% "too many" Chinese births on these auspicious birth dates, whereas Whites show no corresponding increase. The increase in Chinese births is driven by higher parity C-sections: the number of repeat C-sections is 6% "too high" on auspicious birth dates. Sons born to Chinese parents account for the entire increase; daughter deliveries do not seem to be timed to achieve "lucky" birth dates. We also find avoidance of repeat C-section deliveries on the 4th, 14th, and 24th of the month, considered unlucky in Chinese culture. Finally, we replicate earlier work finding that Friday the 13th delivery dates are avoided and document a particularly large decrease among Chinese. For Whites and Chinese in California, mothers with *higher* levels of education are particularly likely to avoid delivering on the 13th.

1. Introduction

Cultural preferences can exert a persistent effect on the fertility decisions of Asian immigrants to the West (Dubuc and Coleman, 2007; Almond and Edlund, 2008; Abrevaya, 2009). Following earlier work on sex selection in Asian countries, excess males births were found among Asian immigrants to Britain, particularly at higher parities (Dubuc and Coleman, 2007). In the US, excess male births among Asian sibships is driven by families where the first birth(s) are exclusively female (Almond and Edlund, 2008; Abrevaya, 2009). In the 2000 US Census 5% sample, having a son is 50% more likely than the biological norm after two daughters when parents are of Chinese, Korean, or South Asian race (Almond and Edlund, 2008). The authors interpret these patterns as driven by conscious decision making by parents (Dubuc and Coleman, 2007; Almond and Edlund, 2008; Abrevaya, 2009). A potentially more benign cultural preference concerns auspicious dates of birth. For reasons expounded elsewhere (Fortin et al., 2014), the number eight is considered lucky by many Chinese, and 4 unlucky. Birth dates falling on the 8th, 18th, or 28th day of the month can readily be achieved through a variety of means, including choosing the date of labor induction and C-section (or postponement thereof). Likewise scheduling C-sections (or inductions) on the 4th, 14th, or 24th might be declined by parents in favor of adjacent dates. To our knowledge, it has not previously been considered whether births by Chinese are skewed to achieve an eight (or avoid a four).

Previous work has considered whether births are timed *vis a vis* auspicious birth *years* according to the Zodiac calendar (Kaku and Matsumoto, 1975; Goodkind, 1996; Rohlfs et al., 2010; Do and Phung, 2010). Conception timing

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and abortion play a large role in governing the effects for birth year, but cannot reliably achieve the "fine tuning" of birth date considered in this paper. Thus, the mechanisms and consequences may differ. Additionally, whereas the superstitions regarding birth years are thought to be gender specific ("girls born in a specific astrological year are regarded as less desirable" (Do and Phung, 2010), usually the 1966 birth year), the Chinese eight and four superstitions *per se* should be gender neutral. Manifestation of these superstitions, however, may be gender-specific in the context of son preference among some Chinese Americans, which we consider below. Additionally, birth frequency and birth outcomes have been shown to vary by season (Lam and Miron, 1991; Currie and Schwandt, 2013; McKinnish et al., 2014) in developed countries.

By considering *short*-term changes in the probability of delivery method among Chinese, Lo (2003)'s analysis of births in Taiwan in 1998 is closest to our own. Lo (2003) found that the C-section rate was 14% higher on "auspicious dates", where "auspicious" was *not* defined using 8s as here but rather "traditional cosmology and astrology" for determining dates "suitable for marriage". The extent to which the number of births were skewed to occur on such dates was not explicitly considered. Lin et al. (2006) found C-section deliveries were reduced in Taiwan during the "ghost month" of lunar July, when major surgical procedures may be considered inauspicious. To our knowledge, it has not been considered whether Asian immigrants to the West show a preference for delivering on specific auspicious birth dates.

Previous research has found short-term manipulations to achieve desired dates of delivery among non-Chinese. Births drop 2–4% during obstetrics conferences (Gans et al., 2007), suggesting accommodation of physician schedules. Date discretion is also observed near the end of the calendar year, which confers a tax advantage for parents relative to birth in early January (Dickert-Conlin and Chandra, 1999). Likewise, births were delayed in Australia to receive a tax bonus (Gans and Leigh, 2009). Additionally, previous work has considered whether certain dates considered unlucky in Western cultures are avoided. In Australia, there are 7.7% too few births on Friday the 13th (Gans and Leigh, 2012). In the US, the number of births fell 11% on Halloweens from 1996 to 2006 and increased 5% on Valentine's Days (Levy et al., 2011). Additionally, environmental factors may also affect birth timing in the absence of deliberate behavior, e.g. Bauer et al. (2013) on sunspot activity.

There is an extensive literature documenting variation in medical treatments that depart from clinical indication, including elective C-section (Minkoff and Chervenak, 2003) or cesarean delivery on maternal request (CDMR). One motivation for CDMR is the "desire to plan/time delivery" (Ecker, 2013). Among these non-clinical determinants of delivery method or delivery timing, achieving "auspicious" birth dates may be particularly difficult to rationalize from the perspective of public health. That said, if there is an increase in the number of C-sections and births on auspicious dates, it is not clear whether it is the health care provider or the parents who drive such an increase (Gans and Leigh, 2012). To address this point, we will consider whether fetal gender affects the likelihood of having an auspicious birth date. Often through prenatal diagnostic ultrasound, gender is routinely revealed to parents prior to delivery in the US. Is achieving an auspicious date more likely when that child is male? Given previous findings of parental preferences for sons among Asian immigrants to the US, parents may be more keen to achieve auspicious dates for their sons. Unless healthcare providers likewise seek to deliver males (but not females) on auspicious dates, it might suggest that it is parents (not providers) who are behind the skewed birth dates.[1]

2. Methods

2.1. Study design and population

We conducted a population-based cohort study using microdata from individual vital statistics natality records covering all live births in California from years 1991 to 2002, collected and maintained by the California Office of Statewide Health Planning and Development (OSHPD). The data we analyze are the same as those in Almond and Doyle (2011). We chose California for the analysis because national natality data produced by National Center for Vital Statistics suppress exact date of birth (beginning in 1989). In addition, California has the largest population of Chinese Americans in the United States. Thirty six percent of all Chinese Americans live in California. Chinese mothers delivering in California were more likely to have attended college than Chinese mothers delivering in other states (1995–2002 CDC Wonder Online Database).

OSHPD's research database includes hospital discharge records linked to birth (and death) certificate records. The birth certificate data report pregnancy and birth characteristics, including pregnancy and birth complications, birth weight and gestational age, as well as parents' age, educational attainment, and place of birth. While race of the newborn will be considered, Hispanic births were not separately identified after 1995. Approximately 96 percent of all births in the vital statistics records were successfully linked to discharge information, which includes admission, discharge date, as well as additional treatment measures described in Almond and Doyle (2011) (measures not analyzed here). Hospital admissions up to one year after delivery are matched to the birth record for both mothers and infants.

The initial dataset contains 6,762,921 births. We restrict the analysis to those births where the mother's race is White or Chinese (82% and 2% of California births, respectively). 1% of records have missing mother's race, and 5% of records have missing baby's gender. We exclude both from our analysis.

[1] Unfortunately, physician race is not available in the data and we will not be able to explore to what extent Chinese providers are driving the skewed birth dates.