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Free universal preschool and the next birth

Noa De La Vega and Analia Schlosser

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Noa De La Vega
European University Institute

Analia Schlosser
Tel Aviv University

Abstract

This paper examines how economic incentives in the form of free universal preschool affect fertility decisions, leveraging the fact that the year a child starts preschool is a discontinuous function of the child's date of birth. Using a regression discontinuity design, we compare fertility patterns of women whose children were born just before or after the preschool entry cutoff date. To address potential seasonality concerns, we utilize an additional source of exogenous variation: a change in Israel's preschool entry cutoff. By incorporating a cohort of women who gave birth within the same time window prior to the preschool cutoff change, we estimate the effects using a difference-in-differences regression discontinuity research design. Our findings reveal that access to free universal preschool shortens births intervals and increases the likelihood of having additional children among Jewish families for whom the alternative is costly childcare arrangements. Conversely, among Arab families, where alternative paid childcare services are limited, access to free universal preschool has no effect on fertility.

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1 Introduction

In recent decades, many countries have been expanding access to preschool education. Their primary objectives commonly include enhancing children's cognitive and non-cognitive skills while providing equal opportunities from an early age. Many of these policies also encompass additional goals such as encouraging fertility, alleviating the financial burden on families with young children, and increasing maternal labor force participation. While interest in these policies has grown, evaluating their effectiveness remains challenging. Most studies have focused on examining the impacts of these policies on children's short- and long-term outcomes and maternal employment. However, relatively little attention has been given to their effects on parents' fertility decisions.

This paper analyzes the causal impact of access to free universal preschool on parents' fertility by examining its effect on birth spacing and completed fertility. To achieve this, we employ a regression discontinuity research design (RDD), exploiting the exogenous variation in preschool eligibility induced by Israel's policy of providing free universal preschool beginning at age three. This eligibility is determined by a sharp discontinuity based on the child's date of birth. Our analysis compares fertility patterns of women whose children were born immediately prior to the preschool entry cutoff date, thus becoming eligible for public preschool one year earlier, and women whose children's birthdates fall just after the eligibility cutoff, consequently delaying their access to public preschool by an additional year. This quasi-experimental approach allows us to isolate the causal impact of earlier access to free preschool on parents' subsequent fertility decisions, controlling for potential confounding factors.

Previous research has shown seasonal variations in the characteristics of women giving birth throughout the year (e.g., Buckles and Hungerman, 2013). To address these concerns and account for other labor-market conditions or labor-supply costs that may be correlated with a child's date of birth, we leverage an additional source of variation in Israel's preschool-entry policy. Until the 2013/14 academic year, the official preschool entry cutoff was based on the Jewish calendar, setting the entry date on the first day of Tevet (the fourth month of the Jewish calendar), which falls between December 3rd and December 28th. From 2014/15 onward, the cutoff was changed to January 1st.[1] By leveraging this variation in preschool entry cutoff dates across different years, we estimate specifications that cover multiple birth cohorts and account for seasonality by including date-of-birth fixed effects. This approach augments the regression discontinuity design (RDD) with a difference-in-differences (DID) model.

[1] To maintain consistency with the Ministry of Education's nomenclature and for the sake of clarity, we denote academic years by the calendar year in which they conclude. For example, the academic year spanning September 2013 to August 2014 is referred to as 2014.

Our findings indicate that access to free universal preschool increases the likelihood of having additional children among certain populations. For the Jewish population, a reduction in annual preschool expenses of USD 6,600–USD 9,000 led to a 1.53% increase in the number of children born after eight years, equivalent to 0.061 more children, on average. Additionally, access to free universal preschool reduces birth intervals within this population. We attribute this to parents of ineligible children adjusting the timing of childbirths to avoid simultaneous private preschool expenses for multiple children. The increase in fertility found for Jewish mothers eligible for free preschool is also present among older mothers, a group for whom any observed increase in short-term fertility is likely to translate to higher completed fertility. These findings suggest that an additional year of free preschool induces an increase in lifetime fertility among Jewish mothers, rather than merely a shift in fertility timing. In contrast, we find no effect of access to free universal preschool on fertility for the Arab population.

Access to free universal preschool is likely to have multifaceted effects on fertility. It is expected to positively affect parents' disposable income if free preschool replaces other paid arrangements. Assuming that children are a "normal good," an increase in income is expected to positively affect the number of children parents choose to have. Free universal preschool is also expected to have an indirect income effect by affecting mothers' labor supply, as lower childcare expenses and increased accessibility are likely to enhance mothers' labor-force participation.[2,3] These changes in labor-force participation may increase the cost of additional children by assigning a higher opportunity cost to women's time.

Thus, the overall effect of access to free preschool on fertility will depend on several factors: the proportion of women who would be employed even in the absence of free universal preschool, the counterfactual costs of childcare, and the availability of alternative childcare options. If the majority of women with young children are already in the labor market, a decrease in the cost of childcare is expected to increase their fertility. However, the fertility effect is inconclusive when childcare enrolment and mothers' employment are initially low.

The diverse population groups in Israel, characterized by varying levels of female labor-force participation, access to childcare, childcare expenses, and fertility patterns, provide an intriguing

[2] In some households, an increase in childcare availability may enhance fathers' employment. However, considering the prevailing norm, in which mothers predominantly assume the role of primary caregivers for young children, it is customary to employ this generalization.

[3] Empirical evidence from recent literature suggests that the introduction of subsidized education as a substitute for existing paid childcare arrangements does not significantly affect maternal labor force participation in environments with already high maternal employment rates. However, in contexts where alternative childcare options are scarce or non-existent, the implementation of subsidized education programs has been observed to positively impact maternal employment (Lundin et al., 2008; Havnes and Mogstad, 2011a; Bauernschuster and Schlotter, 2015).

environment for studying the impact of free universal preschool on fertility. For instance, in 2018, 92.5% of two-year-olds in the Jewish population attended some type of Early Childhood Education and Care (ECEC), whereas only 30.7% in the Arab population did so.[4] To illustrate this disparity further, Figure 1 shows women's employment rates in 2016–2019 by age of youngest child and by population group. Among Jewish mothers, employment rates reach 76% when the child turns two and remain stable thereafter. In contrast, within the Arab population, the employment rate continues to rise as the child ages, climbing to approximately 44% when the child reaches age five.

Our analysis of the impact of free universal preschool among these distinct population groups yields valuable insights into the multifaceted of effects on fertility. Access to free universal preschool significantly lowers the cost of childcare within the Jewish population, given this group's wide use of paid childcare services for children who are ineligible for universal preschool. Consequently, any observed impact of access to free universal preschool on their fertility would primarily be attributed to the direct income effect. Conversely, within the Arab population, where employment rates increase as children grow older and access to childcare at younger ages is limited, we expect to observe a combined influence of direct and indirect income effects on fertility. Given that these two effects operate in opposing directions, it is unclear, a priori, what the overall effect on fertility would be.

Separating the direct and combined income effects on fertility may illuminate the relationship between subsidized childcare and fertility found in the previous literature. In Sweden, a reform that lowered childcare costs took place in a context of almost universal childcare enrolment and very high female employment. As a result, the reform did not affect maternal labor supply but increased fertility among couples without children and narrowed the time interval for higher-order births (Lundin et al., 2008; Mörk et al., 2013). Similarly, an expansion of subsidized preschool in Norway mainly crowded out informal childcare arrangements with nearly no change in the overall amount of care utilized. Consequently, it increased fertility but did not influence maternal labor supply (Havnes and Mogstad, 2011a; Havnes and Mogstad, 2011b).

Bauernschuster et al. (2016) examine the impacts of a German reform that expanded public childcare within a setting of limited childcare and very low female labor-force participation. Their results show that the reform positively affected fertility, with a larger impact at the intensive (i.e., number of children) rather than the extensive margin (i.e., entry into parenthood). Interestingly, they also find a positive effect on female employment. However, given that they did not perform a

[4] *Statistical Abstract of Israel 2020,* Table 4.3: "Children in pre-primary education and day care centers, by ownership, child's age and population group." Data based on Ministry of Education and Ministry of Labor, Social Affairs and Social Services; CBS, *Labor Force Survey,* https://www.cbs.gov.il/en/publications/Pages/2020/Statistical-Abstract-of-Israel-2020-No-71.aspx and includes enrolment in private and public institutions.

heterogeneity analysis, it is not possible to determine whether the increase in fertility and employment comes from the same women or from different women who were affected at different margins (i.e., fertility versus labor supply).

It is important to note that the reforms investigated in previous studies differ substantially from the analysis conducted in this study, which focuses on access to free universal preschool. First, none of the existing literature examines the effects of free universal preschool. While the aforementioned studies investigate the impact of significant reductions in childcare expenses, it is essential to note that childcare subsidies in Sweden and Germany depend on the number of children in the household and on family income.[5] In contrast, preschool in Israel is free regardless of socioeconomic or family status. Another fundamental difference concerns the childcare coverage achieved through these reforms. The Norwegian reform achieved a preschool coverage rate of 28%; the German reform resulted in a relatively low average coverage rate of 15% (ranging from 3.7% to 35.9% in different regions).[6] In Israel, conversely, free universal preschool is mandated by law, ensuring a place in public preschool for every three-year-old. In this respect, Sweden is more comparable, having a 90% enrolment rate for children aged 3–6. It is also noteworthy that the reform in Germany targeted different age groups (ages 1–2), in contrast to the three-year-old age group examined in this study.

Other related studies—Furtado and Hock (2010) and Bar et al. (2018)— show that lower childcare costs due to migration flows or an increase in wage inequality between low- and high-skilled labor increase fertility among high-skilled women. While relevant to our study, their findings are not directly transferable to our setting because universal preschool offers reduced childcare expenses and increased access with a fixed schedule and operating hours.

Our research is also related to a vast body of literature on the effects of financial incentives such as cash transfers, parental-leave benefits, and tax deductions on fertility. These policies are usually found to affect fertility. See, for example, Milligan (2005), Baughman and Dickert-Conlin (2009), Lalive and Zweimuller (2009), Cohen et al. (2013), Azmat and González (2010), González (2013), Raute (2017), and Malak et al. (2019). Other related studies that examine the impacts of home production substitutes on fertility (e.g., Hazan et al., 2022) or changes in the costs of child-raising on fertility (Ebenstein et al., 2016) find that fertility also responds to these factors.

Previous studies leveraged children's date-of-birth variation in preschool and school eligibility using an RDD to evaluate the impact on mothers' labor supply. Gelbach (2002) uses quarter of birth

[5] In the case of the Swedish reform, monthly household payments were reduced from USD 240–USD 600 to USD 160–USD 290, varying with child age, birth order, and family income. In Norway, parents' payments fell from market prices to a maximum of USD 215 per month. The German reform resulted in monthly parental payments varying from 0 to USD 700 depending on socioeconomic status and the number of children in the household.

[6] The Norwegian reform eventually led to higher coverage rates; the 28% rate reported here pertains to the period under examination in the study.

indicators as instruments for preschool enrolment, finding significant effects on maternal labor supply in the U.S. More recent studies that utilize precise birthday information and up-to-date data yield more modest results (Fitzpatrick, 2010; Fitzpatrick, 2012). This research design has been applied to other countries, including Germany, France, and Argentina, with findings typically indicating some positive effects on mothers' employment. These effects are contingent upon factors such as maternal employment rates, age of the youngest child, and family status (Goux and Maurin, 2010; Berlinski et al., 2011; Bauernschuster and Schlotter, 2015).

Our study contributes to the literature on the relationship between childcare expenses, accessibility, and fertility by explicitly examining the implications of providing *free* preschool. Furthermore, it examines the impact of *universal* preschool, accessible to all children with a high (80%) enrollment rate. Additionally, it offers valuable insights into the diverse responses to free universal preschool on fertility among different types of households. Given the notable variations in female labor-force participation and childcare-enrolment rates across population groups in Israel, this study leverages this heterogeneity to analyze how access to free universal preschool influences fertility in distinct contexts. By doing so, it deepens our comprehension of how childcare policies can affect fertility patterns.

The remainder of the paper is organized as follows. Section 2 introduces additional background on early childhood education and care in Israel. Sections 3 and 4 offer a detailed account of the data sources employed in the analysis and describe the identification strategy used. Section 5 presents and discusses the study's results on fertility and additional related outcomes. Finally, Section 6 concludes.

2 Institutional context

Two institutions are responsible for early childhood education and care (ECEC) in Israel. The Ministry of Industry, Trade and Labor (MOITL) oversees children aged 0-2 in daycare centers and pre-nursery home care (hereafter referred to as daycare centers). The Ministry of Education is responsible for pre-primary education, serving children aged 3-5. Starting from the academic year 2017, the Ministry of Education is obligated to finance and ensure the availability of preschools for all children aged 3-4 years in all localities, following the recommendations of the "Committee for Socioeconomic Change" headed by Professor Manuel Trajtenberg. Meanwhile, children aged 0-2 attend paid daycare centers privately owned or supervised by MOITL. According to the Trajtenberg Committee's report, the daycare centers' expenses in 2012 ranged from 1,800 to 3,500 NIS per month (equivalent to USD 460-910), ranging from 18% to 37% of the average monthly wage in 2012.[7]

[7] It is worth noting that the operational hours in daycare centers and pre-primary education programs differ. Daycare centers typically operate until 4:00 or 5:00 pm, whreas pre-primary education programs end their

From an aggregate perspective, Israel has a relatively high enrollment rate in daycare centers among children aged 0-2, standing at 56 percent, compared to an average of 35 percent in OECD countries (OECD, 2017). However, despite this high overall enrollment rate, notable enrollment disparities exist among different demographic groups. A survey conducted by Shachar (2021) provides insights into the contrasting daycare enrollment patterns between the Arab and Jewish populations. The survey reveals that 55% of Arab households care for their children at home until age three compared to 22% of Jewish households. According to Shachar's (2021) survey, 61% of unemployed Arab mothers attribute their unemployment to caring for a child under three years old. Additionally, private daycare is only utilized by 10% of Arab families, whereas 56% of Jewish families opt for this option. It is worth noting that there is a limited market for private daycare within Arab communities and the availability of public daycare centers from the MOITL is also limited.

The benefit embodied in access to free universal preschool depends on the alternative childcare arrangement and can be divided into three scenarios; (1) the child attends private daycare, (2) the child attends public daycare, (3) the child is being taken care of at home. The monetary value of access to free universal preschool depends on the counterfactual daycare costs or the monetary value of the reduced childcare time. According to Shachar's (2021) survey, the average cost of private daycare is NIS 2,700 (USD 710) per month in the Jewish population and NIS 900 (USD 230) in the Arab population. The state sets public daycare costs at NIS 2,019 (USD 530), and families whose income is relatively low are entitled to a partial subsidy of the cost, which reaches up to about 63% of the full cost.[8] According to Shachar's (2021) survey, the average cost of public daycare is NIS 2,000 (USD 525) per month in the Jewish population and NIS 400 NIS (USD 105) in the Arab population. If the child is being cared for at home, access to free universal preschool can be quantified by the monetary value of the reduced childcare time. However, determining the exact value of this benefit is challenging in this scenario, as it relies on whether the child's caregiver will be in the labor market during the year when the child is in preschool.

Given the high prevalence of childcare enrollment among Israeli children, access to free universal preschool is expected to yield a positive aggregate effect on fertility. Yet, the aggregate effect contains a considerable variation among the different population groups. As described above, in the Arab population, free universal preschool provides access to childcare, whereas, in the Jewish population, it mainly constitutes a reduction in childcare expenses. Therefore, by examining the impact of free universal preschool on these groups separately, we can better understand how it affects fertility under different circumstances.

activities by 2:00 pm. Households requiring childcare beyond the standard pre-primary education hours incur additional costs. These supplementary expenses can approximate one-third of the full-time daycare center costs.

[8] The subsidy provided depends on the mother's working hours and the number of children in the household.

3 Data and sample

We utilize individual-level panel data sets maintained by Israel's Central Bureau of Statistics (CBS), accessible under restricted access. These datasets are merged from various administrative sources to create a comprehensive dataset. The resulting dataset include fertility histories, demographic characteristics (e.g., education, religious affiliation, and ethnicity), and earnings of all Israeli parents of children born between 2010 and 2014. Additionally, we supplement the dataset with educational expenditure data from the Israeli Household Expenditure Survey. This additional information enables us to examine heterogeneity in the impacts of free universal preschool according to the counterfactual daycare costs.[9] Appendix A provides a detailed description of our data collection process and the available information for individuals in our dataset.

Our comprehensive data have several advantages that are particularly important for the empirical strategy developed below. First, the data set covers all parents who had a child between 2010 and 2014, allowing us to rely on large samples, even when examining particular groups. Second, the data include each child's exact date of birth, allowing us to identify children born before and after the official preschool entry cutoff date and to measure the exact distance from the cutoff. Third, we have detailed information on education, religion, ethnicity, income levels, and employment.

We analyze the effect of access to free universal preschool on fertility using two samples. Our main analysis sample consists of mothers who gave birth to a child within 90 days before or after the preschool entry cutoff date of January 1st, 2014. Free education for ages 3-4 was fully implemented in 2017, meaning this cohort is the first for which preschool was entirely universal and free. Specifically, this sample encompasses mothers who gave birth between October 3rd, 2013, and March 31st, 2014. We refer to the child born during this period as the "reference child." Considering the entire population of individuals with children born on these dates, our sample comprises 81,264 mothers. We focus on 2014 to obtain the longest perspective on fertility among mothers who had access to free universal preschool.

In addition to the mothers in our initial sample, we expand our sample to include mothers with reference children born between December 8th, 2010, and January 23rd, 2011. This cohort's official preschool entry cutoff during the 2014 school year (when the child turned three) was December 7th, 2010. So all children born during that period were ineligible for preschool.[10] Leveraging this variation

[9] The CBS administers the Expenditure Survey to collect data on household consumption patterns in Israel. This survey encompasses various expenditure categories, including food, housing, transportation, education, healthcare, and leisure activities. A representative sample of households is surveyed every year. Therefore, the analysis based on the household expenditure survey uses a smaller sample.

[10] The implementation of universal free preschool education for children aged 3-4 was not fully realized until 2017. Consequently, not all children born prior to December 7, 2010, had access to this program. However, it is important to note that for the purposes of this study, all children born before this cutoff date are excluded from the analysis, irrespective of their potential access to the program.

in cutoff dates across different years allows us to estimate specifications that cover multiple birth years and account for seasonality by including date of birth fixed effects. This approach supplements the RDD with difference-in-differences (DID) estimates. As a result, we ensure that any seasonal differences in the characteristics of women giving birth at different dates will be differenced out. This approach also controls seasonal variations in labor-market conditions or labor-supply costs, such as holidays, vacations, or seasonal work that may be correlated with a child's date of birth.

4 Empirical framework

4.1 Econometric modelling

To estimate the impact of access to free universal preschool on fertility, we rely on the exogenous variation generated by Israel's preschool entry policies. More precisely, we leverage the discontinuity in the relationship between a child's date of birth and eligibility for preschool at age three, which requires a child to be at least three years old by the cutoff date to start preschool. This cutoff was the first day of Tevet (the fourth month of the Jewish calendar) until the 2014 school year, and January 1st from 2015 onwards. To the extent that children and parents of children born within a narrow window around the cutoff date are similar in observed and unobserved characteristics, we can identify the effect of access to free universal preschool on fertility using a regression discontinuity research design (RDD).

Focusing on mothers who have a child born within a narrow window around January 1st, we define a running variable $days_i$ to be the number of days between the reference child's date of birth and January 1st. Using our main analysis sample, we estimate the following RDD equation:

$$(1)\ \mathrm{y}_i = \beta_0 + \beta_1 1[days_i < 0] + \beta_2 1[days_i < 0] \times days_i + \beta_3 days_i + X'_i\delta + \epsilon_i$$

Where y_i is the outcome of woman *i* (e.g., gave birth to at least one or two additional children within 2,3,4,5,6 or 7 years after the birth of the reference child or total number of children); $1[days_i < 0]$ is an indicator variable that equals one if the reference child of woman *i* was born before the preschool entry cutoff date and zero otherwise; X_i is a vector of observed covariates including indicators for: population groups (Arabs, Jews and others), birth continent, over 12 years of education (mother and spouse), married, new immigrant, above median household income and no household income recorded 13-24 months before the reference childbirth, number of previous children and their ages (defined by a set of variables indicating if previous children are under the following age groups: 1-5, 6-10, 11-15 and 16-21), and ϵ_i is the error term.

The parameter β_1 can be interpreted as the intention-to-treat (ITT) effect of access to free universal preschool on women's fertility outcomes. This parameter provides the relevant policy estimate of the effect of access to free universal preschool on fertility. The key identifying assumption underlying this

framework is that the potential outcomes are continuous around the preschool entry date. In other words, a child's date of birth near the preschool entry cutoff is as good as random.

To estimate the effect of free preschool attendance on fertility, we implement a 2SLS strategy using the following two-equation system:

$$(2)\ preschool_i = \alpha_0 + \alpha_1 1[days_i < 0] + \alpha_2 1[days_i < 0] \times days_i + \alpha_3 days_i + X'_i\lambda + \mu_i$$

$$(3)\ y_i = \gamma_0 + \gamma_1 \widehat{preschool}_i + \gamma_2 1[days_i < 0] \times days_i + \gamma_3 days_i + X'_i\delta + \varepsilon_i$$

Where $preschool_i$, is an indicator variable that equals one if the reference child of woman's *i* is enrolled in public preschool; ε_i and μ_i are the error terms for the first and the second stage equations, respectively. All other variables are as previously defined.

Using the preschool entry cutoff indicator as an instrument for preschool enrolment, the 2SLS estimate of γ_1 provides a consistent estimate of the effect of enrolment in free universal preschool on fertility for households whose preschool enrolment decisions regarding the reference child are determined by the preschool entry policy (i.e., compliers). Under the monotonicity assumption, the instrumental variable estimator from Eq. (3) can be interpreted as the Local Average Treatment Effect (LATE) among the compliers. A violation of monotonicity would imply that parents intentionally delay their child's preschool entry when their child is born before the official preschool entry cutoff while opt to advance their child's preschool entry if their child is born after the cutoff. However, such behavior is implausible in practice.

An additional required assumption is that nothing else occurs around that official preschool entry cutoff except for making preschool free. For example, if parents who have a child born before and after the cutoff date differ or if parents increase their labor supply just because their child is older, this assumption is violated. To control for these potential differences, we leverage an additional source of variation in Israel's preschool entry policy. This allow us to address potential concerns related to seasonality and other labor-market conditions or labor-supply costs that may be correlated with a child's date of birth. Before the 2015 school year (for cohorts born before 2011), the official preschool entry cutoff was the first day of the fourth Jewish month, called "Tevet."[11] From the 2015 school year onwards, the cutoff was changed to January 1st. This variation in the cutoff across years allows us to enhance our RDD by adding additional birth cohorts and applying a difference-in-differences (DID) model to account for seasonality and other children's date of birth effects.

[11] The Jewish calendar is a lunisolar calendar. As such, every month consists of 29 or 30 days and an extra lunar month is added every 2 or 3 years. Therefore, the first day of the fourth Jewish month, known as "Tevet," can fall within a range of dates from December 3rd to December 28th according to the Georgian calendar. This discrepancy in calendar systems introduces variability in the preschool entry cutoff dates for cohorts born before 2011 enrolled to preschool before 2015.

Figure 2 visually demonstrates the preschool entry cutoff for children born in 2010-2011 and for children from our main analysis sample born in 2013-2014. For the 2014 school year, the official preschool entry cutoff was December 7th, 2010, making all children born within ±24 days of January 1st, 2011, ineligible for preschool that year. In contrast, in our main analysis sample focusing on the 2017 school year, children born before January 1st, 2014 were eligible for preschool, while children born on or after January 1st, 2014 were ineligible for preschool. Focusing on these cohorts and limiting the sample to children born within the window of ±24 days around January 1st, we estimate a DID model where we use the cohort born in 2010-2011 to control for seasonality and date of birth fixed effects. As before, we instrument for preschool enrollment using an indicator for being born before the cutoff date, but in this case, we interact this indicator with a dummy variable (after_{it}), which equals one for 2013-2014 cohort, and zero otherwise (for the 2010-2011 cohort). The 2SLS equations can be expressed as follows:

$$(4)\ preschool_{it} = \varphi_i + \alpha_1 1[days_{it} < 0] \times \text{after}_{\text{it}} + \alpha_2 \text{after}_{\text{it}} + X'_{it}\gamma + \mu_{it}$$

$$(5)\ \text{y}_{it} = \varphi_i + \beta_1 \widehat{preschool}_{it} + \beta_2 \text{after}_{\text{it}} + X'_{it}\delta + \varepsilon_{it}$$

Where φ_i is a set of day-month of birth fixed effects and all other variables are as previously defined. This approach is valid under additional common trends assumption, which requires that fertility trends are comparable between cohorts who gave birth before the official preschool cutoff change and those who gave birth afterward.

4.2 Descriptive statistics

Table 1 shows descriptive statistics of individual characteristics and pre-birth labor market history for parents included in the main analysis sample at both sides of the cutoff date (i.e., those whose child was born in October-December 2013 and January-March 2014). Columns (1) and (2) show means for each group, and column (3) reports differences in means, controlling for previous children and differential linear trends in the running variable at both sides of the cutoff. The differences in pre-birth individual and labor market characteristics are small and not statistically significant. One exception is that mothers whose children were born during October-December have fewer years of education than mothers whose children were born in January-March. However, the difference is small and only significant at the 10% level. Overall, the similarity between both samples suggest that treatment assignment is as good as randomly assigned.

The RDD we apply relies on the assumption that there is no manipulation of the running variable around the cutoff date. In the current context, this condition amounts to mothers not precisely controlling their children's birth date. One potential concern is that couples with due dates close to the official preschool entry cutoff may have advanced (or postponed) births and planned cesarean sections to enter (or avoid) preschool a year earlier. However, the comparison between the observed

characteristics of mothers whose reference child was born in October-December and mothers whose reference child was born in January-March we previously provided did not indicate that manipulation is a serious issue in our application.[12]

To further assess this concern, we illustrate in Appendix Figure A1 the daily number of births before and after the preschool cutoff. Visually, there is no apparent evidence of a concentration or "bunching" in the number of births around the preschool entry cutoff date. We formally test for sorting, by estimating Eq. (1), where the outcome variable is the number of children born on a particular date to examine whether there is a discontinuous jump in the number of births around the school entry cutoff. In Appendix Table A1, we provide the results of seven different specifications, varying in the number of days around the preschool entry cutoff included in the sample. These specifications range from 14 days around the cutoff up to 90 days. As shown in the table, all coefficients are small and statistically indistinguishable from zero. Based on these results, we conclude that there is no statistically significant discontinuous jump in the number of births at the preschool entry cutoff. This finding suggests families did not alter their childbirth timing to manipulate preschool enrollment eligibility.

5 Results

Using our main analysis sample, we present graphic evidence of the relationship between the child's date of birth and the enrollment rate in public preschool in the 2017 school year in Figure 3. Each dot corresponds to a day-of-birth cell. The solid lines plot fitted values from a regression of the dependent variable on a linear trend of the running variable on each side of the discontinuity. The figure shows that free public preschool enrollment is highly responsive to the preschool cutoff date. Free public preschool enrollment is around 80% for eligible children and drops immediately to less than 10% for children born after the official preschool entry cutoff (January 1st, 2014).[13]

We proceed by examining the impact of free universal preschool on the probability of having another one or two children *t* years after the birth of the reference child. The dependent variable is an indicator of whether the mother gave birth to at least one or two additional children within 2, 3, 4, 5, 6, and 7 years after the reference childbirth and is calculated according to the number of days between births. For example, we define that a mother gave birth to another child within two years, if the gap between her reference birth and the next birth is less or equal to 730 days. We also estimate

[12] The policy change shifting the enrollment cutoff from Tevet 1 to January 1 was enacted on July 3, 2013. Consequently, women giving birth ±90 days from January 1, 2014, conceived prior to this policy announcement.
[13] Parents of children born two weeks after the cutoff date could appeal for their child's preschool enrollment. Consequently, some children born in the first two weeks of January 2015, after the official cutoff, attended preschool in 2017.

the impact on the total number of children after 2,832 days from the birth of the reference child (the longest observation period available), which is approximately eight years.

The findings are presented in Table 2, where we report the reduced form estimates in columns (2) and (4) and 2SLS estimates in columns (1) and (3) along with first stage estimates for preschool enrollment. The sample in columns (1) and (2) consists of all mothers who gave birth within a 90-days window around January 1st, 2014. To ensure the robustness of our findings, we also report results using a sample of mothers who gave birth within a broader window of 120-days around January 1st in columns (3) and (4). We also report outcomes means (in italics) for mothers of ineligible children and the estimated effect as a percentage of the outcome mean.

About 24% of the mothers had another child within two years, and about 44% did so within the following three years (56%, 63%, 66% and 68% within four, five, six and seven years, respectively). About 3% of the mothers had another two children within three years, and about 11% did so within the following four years (20%, 27%, and 33% within five, six and seven years, respectively).

The first stage estimate reported in column (1) shows that children born 90 days before the cutoff date (January 1st, 2014) are about 72.9 percentage points more likely to be enrolled in public preschool than children born 90 days later. The results remain highly similar when comparing between children born 120 days around the cutoff date. As shown in column (1) for mothers who gave birth within a 90-days window, enrollment in free preschool of the reference child significantly increased the likelihood of having at least one more child in the following two years by 6%. The increase in the likelihood of having an additional child was 7.1% after three years and 6.69% after four years. After that, the effect is still present but decreases in magnitude, both relative to the outcome means and in absolute terms. After seven years, the effect is a 2.59% increase in the probability of having another child.

We also found that enrollment in free preschool of the reference child significantly increased the likelihood that the mother has at least two more children in the following three years by 21.72%. After four years, mothers of eligible children are 12.57% more likely to have had another two children (14.13%, 9.84%, and 6.46% within five, six and seven years, respectively). Overall, after eight years, mothers of eligible children who enrolled them in free preschool have, on average, 0.072 more children (an increase of 1.83%) relative to ineligible mothers who had to wait for another year to enroll their child in preschool.

We assess the robustness of the fertility results to alternative bandwidths and specifications in Appendix Table A2 where we present the RDD estimates within a reduced form framework (Eq. (1)) for seven different specifications. In columns (1) to (5), we select the sample varying the number of days around the cutoff from 21 to 120. In column (7), we estimate the model using a local weighted linear regression with triangular kernel and mean squared error optimal bandwidth. Our estimates of

the effect of access to free universal preschool on subsequent fertility are robust to the bandwidth choice. This is also illustrated in Appendix Figures A3 and A4, where we plot the estimated local weighted linear regression coefficients with triangular kernel and their 95% confidence interval using all possible bandwidths (up to ±120 days). The estimated effects significantly differ from zero and stabilize for bandwidths larger than ±80 days. We also report the results from a "donut" RDD specification in column (6) of Table A2, where we exclude the seven days right before and after the cutoff to further assess whether potential manipulation of children's birth date close to the cutoff drives the results. The results are robust to the exclusion of mothers who gave birth close to the cutoff.

We also estimate a RD-DID specification to further control for any seasonal differences in the characteristics of women giving birth at different dates and variations in labor-market conditions or labor-supply costs that may be correlated with a child's date of birth. As explained above, in this setup we add to our original sample, all mothers who gave birth around January 1st, 2011 and limit the sample to ±24 days around January 1st. Appendix Figure A2 shows public preschool enrollment for the cohort of children born in 2010-2011 by birth distance (in days) from January 1st. In the 2014 school year, when the school cutoff date was December 7th, 2010, the public preschool enrollment rate was around 70% for eligible children and dropped immediately to 0 for children born after the official preschool entry cutoff.[14] Since in the 2014 school year, the official preschool entry cutoff was December 7th, 2010; children born ±24 days around January 1st, 2011, were ineligible to enter preschool. We therefore use this cohort to net-out any fertility effect correlated with day and month of birth of the reference child.

We report the results of the RD-DID specification in Appendix Table A3 where enrollment in preschool is instrumented by the interaction between the indicator of being born before January 1st and an indicator for the 2013-2014 cohort (Eq. (4) and (5)). Column (1) reports the 2SLS estimates. Column (2) reports the reduced form estimates for the 2013-2014 cohort, where children born before January 1st are eligible for preschool and children born after January 1st are ineligible. Column (3) reports the reduced form estimates for the 2010-2011 cohort, where children born at both sides of January 1st are ineligible for preschool. Column (4) reports the reduced form RD-DID.

As seen in Column (3), there is no systematic relationship between birth before January 1st and subsequent fertility. This is reassuring as it suggests that mothers who gave birth slightly before or after January 1st had similar fertility choices. In contrast, we see in Column (2) that for the cohort that January 1st determined the preschool entry cutoff date, subsequent fertility was higher for women who gave birth before January 1st. For this cohort, mothers of eligible children have 0.057 more

[14] Not all children born before December 7th, 2010, had access to free universal preschool since it was fully implemented for ages 3-4 only in 2017. For the same reason, the public preschool enrollment rate dropped to 0 for children born after the official preschool entry cutoff.

children after eight years, an increase of 1.43%. Note, however, that in this specification, the number of days around the cutoff is much smaller, resulting in a smaller sample size and a loss of power. As a result, the coefficient of the total number of children is statistically indistinguishable from zero. Nevertheless, results reported in this table show that the effect of access to free universal preschool on subsequent fertility cannot be explained by seasonal variations in the characteristics of women giving birth throughout the year, as almost all the estimates maintained their direction, strength, and significance.

Overall, our findings reveal that access to free universal preschool affects the timing of subsequent births and, to a certain extent, increases the likelihood of having additional children. In the following subsections, we aim to explore the effects on specific population subgroups to achieve a more comprehensive understanding of the potential channels through which access to free universal preschool affects fertility. In subsection 5.2, we further investigate whether the fertility effect observed is permanent or transitory. If the effect is transitory, it suggests that parents primarily adjust the timing of their births in response to access to free universal preschool. Conversely, if the effect is permanent, it indicates that parents choose to have more children, resulting in increased completed fertility.

5.1 Increase in fertility – mechanisms

In this subsection, we investigate the heterogeneity in the effect of access to free universal preschool on fertility by examining how it varies according to the share of women in the labor market and the counterfactual childcare costs. We hypothesize that the impact of access to free universal preschool on fertility will be greater in populations with higher labor force participation and higher childcare costs, as observed in the Jewish sector. In contrast, where both parameters are low, as in the Arab sector, the effect on fertility is ambiguous.

To evaluate the reduction in childcare costs due to access to free universal preschool, we estimate the decrease in the expenditure on educational services comparing between households with children born before and after the preschool cutoff date using data from the CBS Expenditure Survey. Specifically, we use the CBS Expenditure Survey data on "total education services expenditure". This variable summarizes various educational expenses, including tuition fees, materials, books, and various educational programs and activities. Additionally, we created a new variable, "total private preschool expenditure," that summarizes the total expenditure on private preschool, daycare, nursery school, and nanny services. In light of the substantial difference in preschool expenses observed between the Jewish and Arab sectors in Shachar's (2021) survey, we performed this estimation separately for the two sectors. However, since only a very small portion of our sample was surveyed

(only 277 observations in the Jewish sector and 63 in the Arab sector), our estimates should be interpreted with caution.

First, as seen in Appendix Table A4 Panel A, the expenditure on education services and private preschool in the Arab sector is much lower than in the Jewish sector. While Jewish households with a child ineligible to free universal preschool spend, on average, 1,562 NIS on preschool (2,869 NIS on all education services), the equivalent expenditure among Arab households is 162 NIS (575 NIS). This result is consistent with Shachar's (2021) survey and past studies that analyzed the CBS Expenditure Survey data (e.g., Shraberman and Blass, 2016). The difference in preschool expenditures between Jewish and Arab households is attributed both to the limited usage of private preschools among Arabs and lower childcare costs in Arab communities.[15]

Table A4 presents the effect of access to free universal preschool on household expenditure for educational services expenditure across various model specifications. Columns (1) and (4) report estimates from a specification without control variables, while columns (2) and (5) include control variables. Our preferred specification, reported in columns (3) and (6), includes control variables and is based on a local weighted linear regression with triangular kernel and mean squared error optimal bandwidth. The results indicate that access to universal free preschool incurs a reduction of 1,238 NIS per month in the total education services expenditure and 1,518 NIS in the private preschool expenditure for the Jewish subsample.[16] In contrast, no reduction was observed in the Arab subsample.[17]

Table 3 presents the results of our main specification, looking separately at the Jewish (columns (3) and (4)) and Arab population (columns (5) and (6)). Since we stratify our main sample, we extend the window around the school entry cutoff to 120 days to gain power. Columns (1) and (2) report 2SLS and reduced form results derived from the full sample using this extended window.[18]

[15] The mean preschool expenditure conditional on spending a positive amount is 1,844 NIS among Jewish households and 758 NIS among Arab households.

[16] The total expenditure on education services includes various components, such as after-school programs and classes. These additional expenses may offset the specific costs directly related to the child. Moreover, any decrease in expenses for a particular child due to the availability of free preschool education might be counterbalanced by expenses related to other children in the household. As noted in Appendix A, the data on expenditures for educational services were provided in an aggregated form for each household. This means that the measurements reflect the total educational expenditures for all children in the household rather than the reference child. These factors contribute to the observed smaller reduction in total educational expenditure relative to the decrease in private childcare expenses.

[17] Panel b of Appendix Table A3 shows a robustness check where we exclude survey responses from the third quarter of the year, which mostly takes place in the summer months (when the free education law does not apply). The exclusion of these observations reduces the sample size (which was already very small). We therefore add an additional year cohort to this analysis (i.e. mothers who gave birth ±90 days around January 1st, 2015). For this cohort, we rely on the responses of individuals who were surveyed during the last quarter of 2017 and the first two quarters of 2018. As can be seen in the table, the results remain robust.

[18] To assess the robustness of our findings, we performed a sensitivity analysis by excluding Christian Arabs from the sample. The results remained consistent with our primary findings.

We observe significant effects of access to free universal preschool on subsequent fertility for the Jewish population. As shown in column (3) for Jewish mothers who gave birth within a ±120 day window, free preschool enrollment significantly increases the likelihood of having at least one more child in the following two years by 7.47%. After four years, the effect is 4.66%. After that, the effect is still present but decreases in magnitude, both relative to the outcome means and in absolute terms. After seven years, the effect is a 1.84% increase in the probability of having another child. We also find an increase in the likelihood of having at least two more children in the following five years by 13.11%. Overall the effect on total number of children born to Jewish mothers after eight years is 0.061, an increase of 1.53%. In contrast, for the Arab population, the effect of access to free preschool on subsequent fertility is small, inconclusive, and not statistically significant.

The variation in the fertility effect between the Jewish and the Arab sectors is consistent with the differences in maternal labor force participation, childcare enrollment, and childcare costs. Access to free universal preschool substantially reduces the financial burden of raising children in the Jewish sector. Conversely, the Arab sector is characterized by significantly lower childcare enrollment for children aged 1-2, and relatively lower childcare fees. As a result, universal preschool does not incur a significant change in educational expenditures among Arab households. Moreover, there has been a progressive increase in employment rates among Arab mothers. This trend towards higher employment can act as a mitigating factor and potentially offset any positive income effect on fertility within this population.

Our analysis reveals that reductions in the cost of childcare can increase fertility, contingent upon pre-existing high levels of maternal labor force participation, childcare enrollment rates, and childcare expenses. Conversely, in contexts characterized by initially low childcare enrollment and maternal employment rates, access to free universal preschool does not necessarily affect fertility.

We next examine additional issues related to fertility responses to access to free universal preschool. Having found that the fertility effects are concentrated among the Jewish population, we perform the rest of the fertility analysis solely on this subsample.

5.2 ***Re-timed childbirth versus increase in total fertility***

Our findings indicate that access to free universal preschool increases the likelihood that Jewish parents have additional children within seven years. The effect could be temporary if parents of ineligible children adjust the timing of their children's births to avoid paying for private preschool for two children, without affecting their total fertility. Nevertheless, the effect on birth spacing might also result in an increase in total fertility. We therefore perform an additional analysis to determine

whether access to free universal preschool increases completed fertility or merely narrows spacing between births.

To examine the dynamic effects of access to free universal preschool on fertility, we estimate our RDD model for different follow-up periods following the birth of the reference child. Figure 4 presents the RDD estimates with 95% confidence bands for the probability of having at least one more child over different birth intervals (ranging from 730 to 2,832 days) following the reference childbirth (shown on the left vertical axis). The right vertical axis displays the share of women having an additional child within the same period. The estimated coefficients exhibit an inverse U-shaped pattern over time, peaking at 3.5 years after the birth of the reference child and subsequently decreasing to one percentage point (1% relative to the outcome mean) in the eighth year. A possible explanation for our findings is that parents who are liquidity constrained and cannot pay for private preschool for two children simultaneously shorten the time interval between births when their reference child is eligible for free universal preschool one year earlier. Given that most parents in our sample ultimately have at least one more child (70%) within seven years, the effect on the probability of having at least one additional child declines over time.

Figure 5 presents the estimates and confidence bands for the probability of having at least two more children as a function of time (in days) since the reference childbirth (left axis) alongside the share of women having at least two children (right axis). The figure demonstrates that the effect on the probability of having at least two additional children remains steady over eight years after the birth of the reference child. Specifically, when the reference child is eligible for free universal preschool one year earlier, the likelihood of having at least two additional children increases by two percentage points higher representing a 5.5% increase. This stable increase in the probability of having at least two additional children throughout the eight-year period following the birth of the reference child suggests an increase in complete fertility rather than merely a reduction in birth spacing.

In sum, our fertility analysis indicates that access to free universal preschool for the Jewish population both alters the timing of the next birth and increases the probability of having at least two more children. While censoring issues preclude a full estimation of the effect on completed fertility, our findings of a steady effect on the probability of having at least two children after eight years since the birth of the reference child, strongly suggest that the observed impact represents a genuine increase in overall fertility rather than merely a temporal shift in birth timing.

To further examine whether the observed fertility impact is permanent or temporary, we examine the effect on women approaching the end of their reproductive years. In these cases, any increase in fertility likely indicates a permanent rise. Table 4 presents estimates for the Jewish population,

stratified by mothers' birth year (those born before 1980 versus those born in 1980 or later).[19] The group of older mothers consists of women aged 33 years or older at the time of the reference childbirth, with a mean age of 37.5 years. Seven years later, their ages range from 40 years and above, with a mean age of 44.5. The group of younger mothers, with a mean age of 28 years, were under 33 years old at the time of the reference childbirth.

The impact of access to free universal preschool on fertility is observed across older and younger mothers. After four years, eligible older mothers who enrolled their children in free preschool were 19% more likely to have another child compared to those ineligible to free preschool. This effect persists after seven years, resulting in a 1.76% increase in the number of children. For younger mothers, there was approximately a 5% increase in the likelihood of having at least 2 children within seven years, leading to a 1.5% increase in their number of children during that period.

Consistent with our previous results, this analysis suggests that access to free universal preschool both altered the timing of subsequent births and increased lifetime fertility. Our estimates show a significant positive effect on older women, a group for whom any observed increase in short-term fertility is likely to translate into an upturn in completed fertility. Consequently, our findings indicate an increase in lifetime fertility rather than merely a shift in fertility timing.

5.3 Heterogeneity by parity of the reference child

Our previous analysis has shown a positive impact of access to free universal preschool on fertility. Given that the free universal education policy is applicable only to children aged three years and older, familiarity with the education system is crucial for understanding the enrollment policy in public preschool and its economic implications. Consequently, in this subsection, we investigate whether the effects of access to universal preschool on fertility vary according to the birth parity of the reference child.

We hypothesize that the fertility effect will be more pronounced for families who have at least one older child, as these families are likely more familiar with the preschool entry policy and its financial implications. The anticipated differences in the fertility effect between families with a reference child of parity two versus those with a reference child of parity three or higher are not clear a priori. Financial considerations may exert a stronger influence on families with more children. However, families with more children may assign greater importance to cultural norms on their fertility decisions

[19] Due to data limitations, we only have access to mother's birth year, which complicates precise age determination at the time of the reference child's birth. This limitation is particularly significant because eligibility for free universal preschool is based on the reference child's birth year. Calculating the mother's age as the difference between the childbirth year and the mother's birth year would result in mechanical variations among groups due to the lack of precise maternal birthdate information. Consequently, we opt to stratify the sample based on the mother's birth year rather than her calculated age.

or may be less inclined to postpone additional pregnancies due to concerns about approaching the end of their fertility window.

In Table 5 we present estimates stratified by the birth order of the reference child. Our analysis reveals that the effect on the probability of having an additional child is more pronounced for mothers whose reference child is of parity two. Specifically, the fertility effect within 3 years is 13.26% for mothers whose reference child is at parity two compared to a fertility effect of 7.66% for mothers at parity three. In contrast, the effect for mothers whose reference child is their first born is smaller and statistically insignificant during the first two to three years after birth. This finding suggests that the impact of free universal preschool on fertility may be particularly significant for families with prior experience with public preschools.

Interestingly, after four years, one year after the eligible reference child can enroll in preschool, we observe a significant effect even for mothers whose reference child is the firstborn.[20] Specifically, we see an increase of 4% in the likelihood of having an additional child after four years and an 18.63% increase in the probability of having two additional children during that period. Consequently, the positive effect on the total number of children is also significant for mothers whose reference child is the firstborn. In contrast, we find no significant effect on completed fertility for families with a reference child of parity three or higher. These families may have already planned for a considerable number of children, rendering the 8-year period insufficient for readjusting their overall fertility. Alternatively, this subgroup may include a high share of ultra-orthodox individuals, a group for whom financial incentives have been found to have less impact on completed fertility, as documented by Cohen et al. (2013). In ongoing work, we are examining this issue, by analyzing the separate effect for ultra-orthodox women.

Our analysis in this subsection suggests that the effect of access to free universal preschool on fertility depends on parents' knowledge of the monetary value of the free universal preschool benefit and the preschool cutoff age for enrollment. Our findings indicate that parents may not be initially aware of the economic value of free universal preschool. However, once they enroll their child in preschool, they internalize the knowledge that public preschool is free. This result is consistent with the findings of Mörk et al. (2013) who observed that households with children reacted earlier than households without children to changes in childcare costs.

[20] The one-year lag in the observed effects is primarily attributable to the duration of pregnancy.

6 Conclusions

This study examines the impact of access to free universal preschool on fertility decisions in Israel. Leveraging exogenous variation in preschool eligibility based on children's birthdates, we employ a regression discontinuity design and compare fertility patterns of households who have a child born within a narrow window around the preschool eligibility cutoff. We find that access to free universal preschool affects fertility decisions of households in Israel. The effects are concentrated among the Jewish population, where childcare costs and maternal employment rates are high. Specifically, it leads to a 6% increase in the likelihood of having two additional children within seven years, resulting in an increase of 1.5% in the total number of children. In contrast, we find no significant impacts on fertility among Arab families, who have lower childcare enrollment and maternal employment rates.

The fertility effects found among the Jewish population appear to represent both changes in birth timing and increases in completed fertility. Families eligible for free preschool have shorter birth intervals, suggesting that those who do not have access to free preschool wait longer to have an additional child to avoid simultaneous private preschool expenses for multiple children. The persistent effects among older mothers approaching the end of their reproductive years indicate an increase in lifetime fertility. We also find that the impacts are larger for families with prior children, suggesting the importance of familiarity with the preschool system in shaping fertility responses.

Our findings demonstrate that reducing childcare costs through free universal preschool can increase fertility rates in contexts with high female labor force participation and childcare use. This is particularly relevant for countries facing demographic challenges and low birth rates. In contrast, free preschool may have limited fertility impacts in communities with low maternal employment and limited use of formal childcare.

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Figures

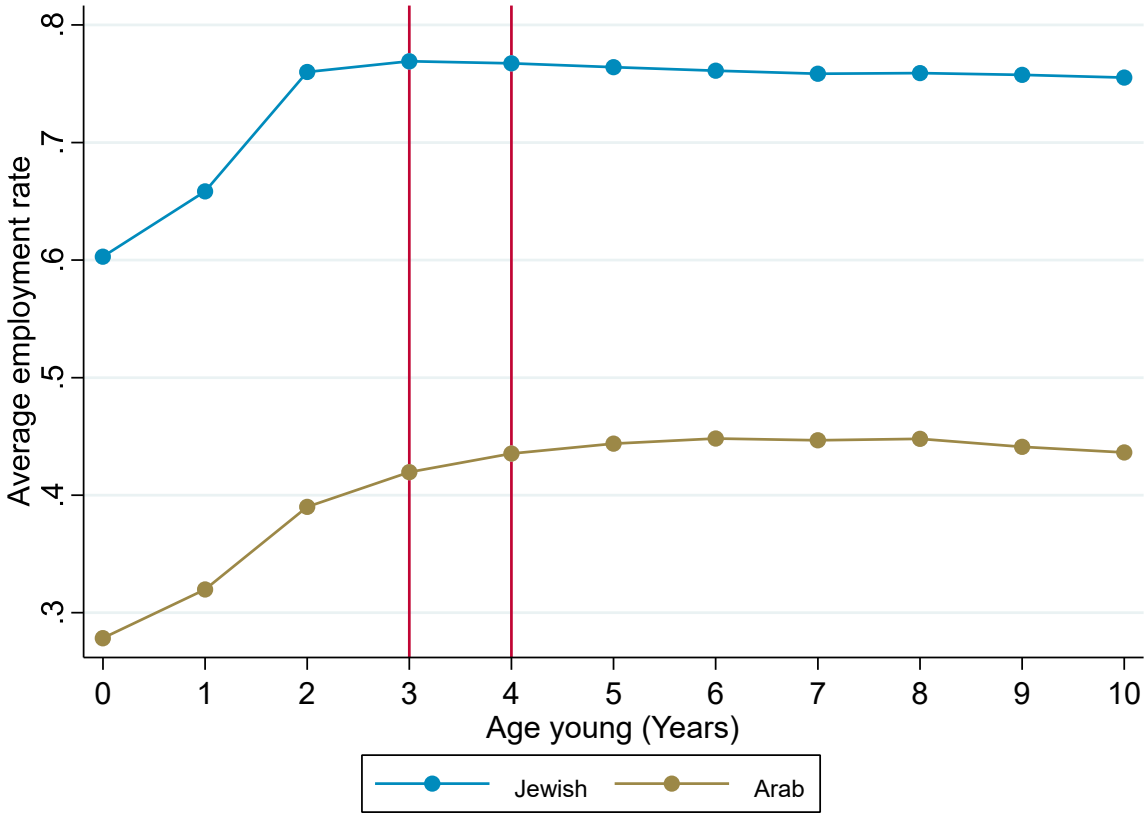

Figure 1. Employment rates by the age of the youngest child

Notes: The sample includes all mothers who gave birth between 2006 and 2021. Employment rates were calculated using income data for the years 2016 to 2019.

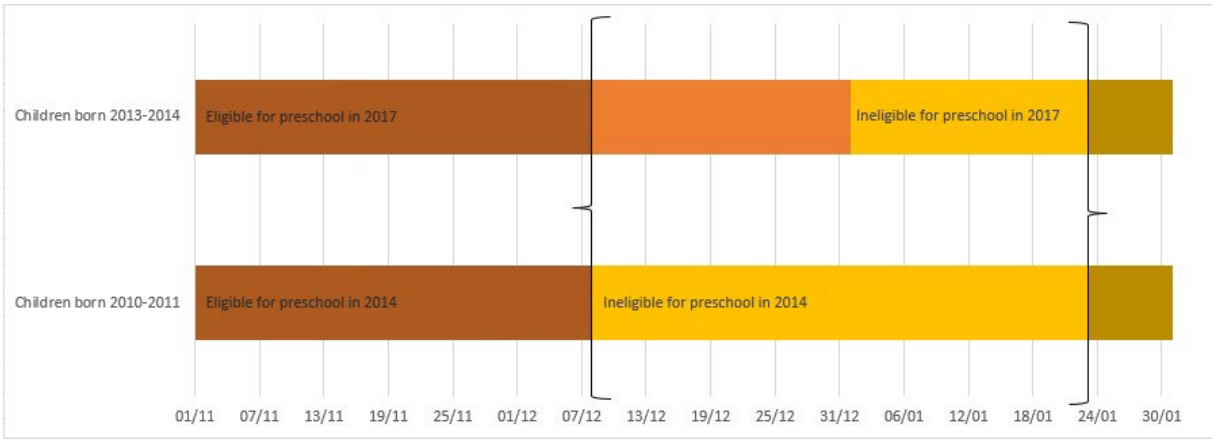

Figure 2. Preschool entry cutoff

Notes: The figure shows the preschool entry cutoff for children born in 2010-2011 and those born in 2013-2014 by day and month of birth.

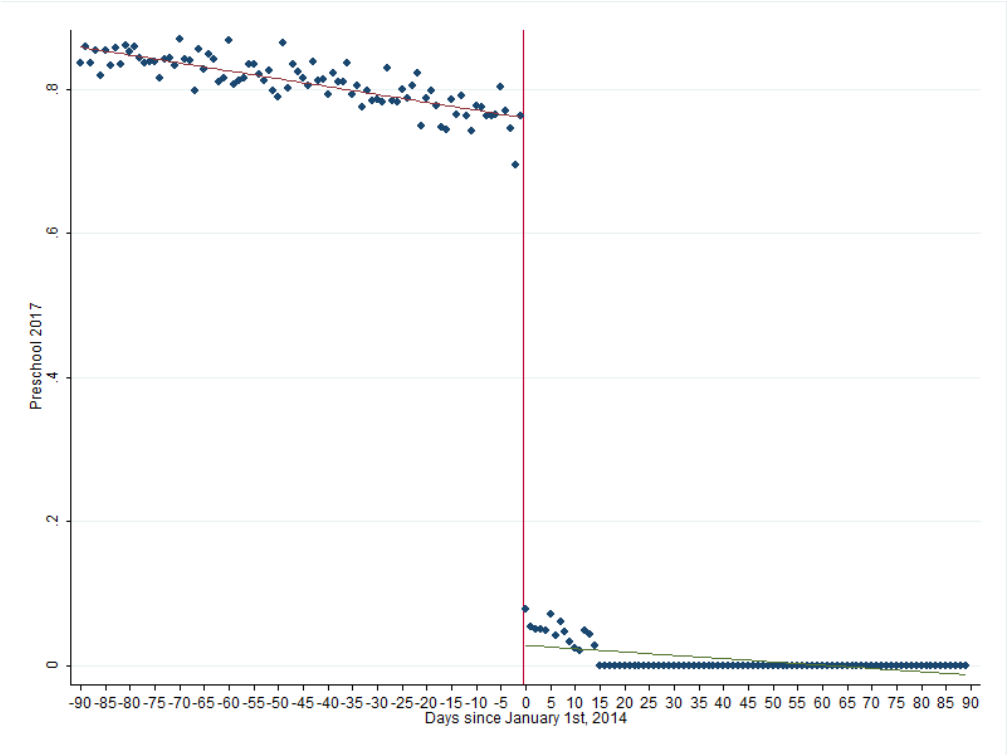

Figure 3. Preschool enrollment rates by child's date of birth (2017 school year)

Notes: The figure shows public preschool enrollment rates in the 2017 school year by distance of the child's birth date (in days) from the preschool entrance cutoff date. The solid lines plot fitted values from a linear regression of enrollment to public preschool on the running variable at both sides of the eligibility cutoff. The vertical line represents January 1st, 2014 – the preschool entry cutoff date.

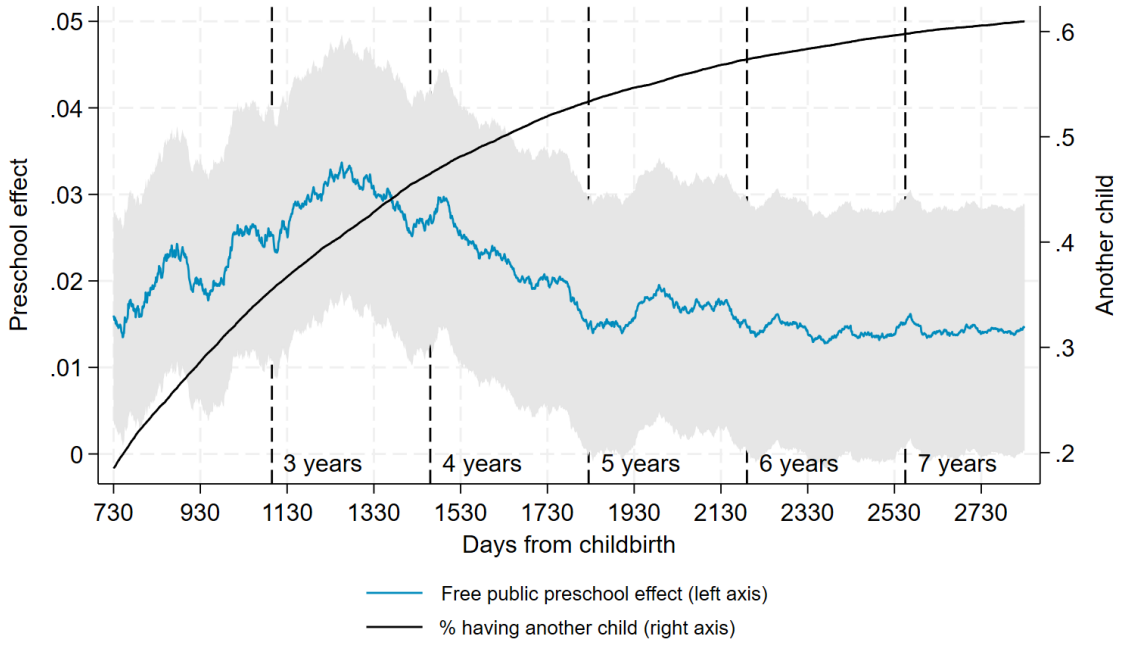

Figure 4 Day-by-day effect on the probability of having at least one more child

Notes: The sample includes all Jewish mothers who gave birth ±90 days around January 1st, 2014. The left vertical axis presents the RDD estimates of the probability of having at least one more child by days since the reference childbirth (730 to 2,832 given in the horizontal axis). The shaded area shows the 95% confidence interval for each coefficient. The right vertical axis shows the share of women having at least one more child within that period.

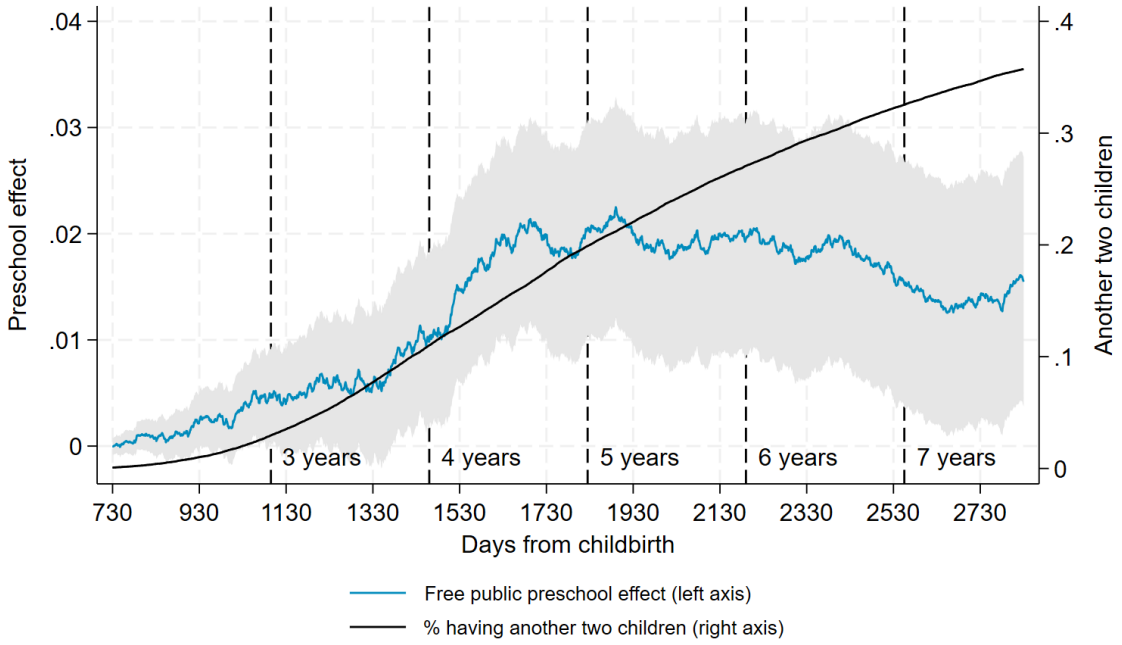

Figure 5 Day-by-day effect on the probability of having at least two more children

Notes: The sample includes all Jewish mothers who gave birth ±90 days around January 1st, 2014. The left vertical axis presents the RDD estimates of the probability of having at least two more children by days since the reference childbirth (730 to 2,832 given in the horizontal axis). The shaded area shows the 95% confidence interval for each coefficient. The right vertical axis shows the share of women with at least two more children within that period.

Table 1. Descriptive statistics

	Child Born before January 1st (1)	Child Born on or after January 1st (2)	Difference controlling for linear trends (3)
Individual characteristics			
Birth year	1983	1983	0.114
			(0.070)
Married	0.939	0.943	-0.001
			(0.003)
New Immigrant (1990)	0.044	0.045	-0.001
			(0.003)
Education (years)	13.71	13.78	-0.069*
			(0.037)
Spouse education (years)	13.25	13.27	-0.060
			(0.039)
Baby boy	0.514	0.513	0.009
			(0.007)
Number of previous children	1.682	1.679	0.024
			(0.026)
Labor market history: 13-24 months before reference childbirth			
Months of employment	7.08	7.11	0.039
			(0.072)
Earnings (yearly in shekels)	44,668	45,194	-901
			(804)
Employment	0.574	0.574	0.001
			(0.007)
Spouse's months of employment	7.71	7.62	0.047
			(0.081)
Spouse's earnings (yearly in shekels)	78,250	77,123	-511
			(1482)
Spouse's employment	0.625	0.619	0.003
			(0.007)
Number of observations	41,481	39,783	81,264

Notes: The table reports descriptive statistics of pre-birth characteristics of all mothers who gave birth ±90 days around January 1st, 2014 in columns (1) and (2). Column (3) report differences in means controlling the previous number of children and linear trends. Robust standard errors are reported in parentheses. Income is measured in 2010 NIS. *p<0.10, **p<0.05, ***p<0.01

Table 2. Effect of access to free universal preschool on fertility

	±90 days		±120 days			±90 days		±120 days	
	2SLS	Reduced form	2SLS	Reduced form		2SLS	Reduced form	2SLS	Reduced form
	(1)	(2)	(3)	(4)		(1)	(2)	(3)	(4)
First stage	0.729***		0.743***						
	(0.004)		(0.004)						
Mean (comparison group)	*0.008*		*0.006*						
Child within 2 years	0.014*	0.010*	0.010	0.008	**Two children within 3 years**	0.006**	0.005**	0.003	0.002
	(0.008)	(0.006)	(0.007)	(0.005)		(0.003)	(0.002)	(0.003)	(0.002)
Mean	*0.237*	*0.237*	*0.236*	*0.236*	*Mean*	*0.030*	*0.030*	*0.029*	*0.029*
Effect as % of mean	5.99%	4.37%	4.40%	3.27%	Effect as % of mean	21.72%	15.83%	11.04%	8.20%
Child within 3 years	0.031***	0.023***	0.024***	0.018***	**Two children within 4 years**	0.014**	0.010**	0.010**	0.007**
	(0.009)	(0.006)	(0.007)	(0.005)		(0.006)	(0.004)	(0.005)	(0.004)
Mean	*0.439*	*0.439*	*0.438*	*0.438*	*Mean*	*0.110*	*0.110*	*0.109*	*0.109*
Effect as % of mean	7.10%	5.17%	5.43%	4.03%	Effect as % of mean	12.57%	9.16%	9.21%	6.84%
Child within 4 years	0.037***	0.027***	0.023***	0.017***	**Two children within 5 years**	0.028***	0.020***	0.021***	0.016***
	(0.008)	(0.006)	(0.007)	(0.005)		(0.007)	(0.005)	(0.006)	(0.004)
Mean	*0.559*	*0.559*	*0.559*	*0.559*	*Mean*	*0.199*	*0.199*	*0.198*	*0.198*
Effect as % of mean	6.69%	4.88%	4.08%	3.03%	Effect as % of mean	14.13%	10.30%	10.61%	7.88%
Child within 5 years	0.019**	0.014**	0.010	0.008	**Two children within 6 years**	0.027***	0.019***	0.020***	0.015***
	(0.008)	(0.006)	(0.007)	(0.005)		(0.008)	(0.006)	(0.007)	(0.005)
Mean	*0.626*	*0.626*	*0.626*	*0.626*	*Mean*	*0.271*	*0.271*	*0.270*	*0.270*
Effect as % of mean	3.00%	2.18%	1.66%	1.23%	Effect as % of mean	9.84%	7.17%	7.48%	5.55%
Child within 6 years	0.017**	0.013**	0.013*	0.009*	**Two children within 7 years**	0.021***	0.015***	0.017**	0.013**
	(0.008)	(0.006)	(0.007)	(0.005)		(0.008)	(0.006)	(0.007)	(0.005)
Mean	*0.664*	*0.664*	*0.664*	*0.664*	*Mean*	*0.325*	*0.325*	*0.324*	*0.324*
Effect as % of mean	2.59%	1.89%	1.92%	1.43%	Effect as % of mean	6.46%	4.71%	5.30%	3.94%
Child within 7 years	0.018**	0.013**	0.014**	0.010**	**Number of children**	0.072***	0.053***	0.053***	0.039***
	(0.008)	(0.006)	(0.007)	(0.005)		(0.019)	(0.014)	(0.016)	(0.012)
Mean	*0.684*	*0.684*	*0.685*	*0.685*	*Mean*	*3.961*	*3.961*	*3.946*	*3.946*
Effect as % of mean	2.59%	1.89%	2.03%	1.51%	Effect as % of mean	1.82%	1.33%	1.33%	0.99%
Number of observations	81,264	81,264	108,337	108,337	Number of observations	81,264	81,264	108,337	108,337

Notes: Each coefficient comes from a different regression (robust standard errors in parentheses). The sample includes all mothers who gave birth ±90 or ±120 days around January 1st, 2014 . The dependent variable is an indicator for whether the mother gave birth to at least one or two additional children within 2,3,4,5,6 or 7 years after the birth of the reference child or total number of children; the main independent variable is an indicator for the reference child being born on or after January 1st, 2014. Controls include education, age at first childbirth, indicators for- married, birth continent, new immigrant, number of previous children, indicators for- above the median household income and no household income, previous children age groups (a set of variables indicating if previous children are under the following age groups: 1-5, 6-10, 11-15 and 16-21). The models control also for a linear trend in the running variable across both sides of the discontinuity cutoff. *p<0.10, **p<0.05, ***p<0.01

Table 3. Effect of free universal preschool on fertilit by population group

	Full sample (Jews+Arabs)		Jews		Arabs	
	2SLS	Reduced form	2SLS	Reduced form	2SLS	Reduced form
	(1)	(2)	(3)	(4)	(5)	(6)
First stage (preschool enrollment)	0.747***		0.750***		0.745***	
	(0.004)		(0.004)		(0.008)	
Mean (comparison group)	*0.006*		*0.007*		*0.001*	
Child within 2 years	0.009	0.007	0.018**	0.013**	-0.013	-0.010
	(0.007)	(0.005)	(0.007)	(0.006)	(0.015)	(0.011)
Mean	*0.240*	*0.240*	*0.240*	*0.240*	*0.260*	*0.260*
Effect as % of mean	3.87%	2.89%	7.47%	5.60%	-5.20%	-3.88%
Child within 3 years	0.022***	0.017***	0.031***	0.023***	0.000	0.000
	(0.007)	(0.006)	(0.008)	(0.006)	(0.016)	(0.012)
Mean	*0.450*	*0.450*	*0.450*	*0.450*	*0.420*	*0.420*
Effect as % of mean	5.02%	3.76%	6.87%	5.15%	-0.11%	-0.08%
Child within 4 years	0.021***	0.016***	0.027***	0.020***	0.007	0.005
	(0.007)	(0.005)	(0.008)	(0.006)	(0.016)	(0.012)
Mean	*0.570*	*0.570*	*0.580*	*0.580*	*0.530*	*0.530*
Effect as % of mean	3.67%	2.75%	4.66%	3.49%	1.28%	0.95%
Child within 5 years	0.008	0.006	0.013*	0.010*	-0.003	-0.002
	(0.007)	(0.005)	(0.008)	(0.006)	(0.016)	(0.012)
Mean	*0.630*	*0.630*	*0.650*	*0.650*	*0.600*	*0.600*
Effect as % of mean	1.23%	0.92%	1.98%	1.49%	-0.45%	-0.33%
Child within 6 years	0.010	0.008	0.012	0.009	0.012	0.009
	(0.007)	(0.005)	(0.007)	(0.006)	(0.015)	(0.012)
Mean	*0.670*	*0.670*	*0.680*	*0.680*	*0.640*	*0.640*
Effect as % of mean	1.50%	1.12%	1.73%	1.30%	1.80%	1.34%
Child within 7 years	0.010	0.008	0.013*	0.010*	0.008	0.006
	(0.007)	(0.005)	(0.007)	(0.005)	(0.015)	(0.011)
Mean	*0.690*	*0.690*	*0.700*	*0.700*	*0.670*	*0.670*
Effect as % of mean	1.47%	1.10%	1.84%	1.38%	1.26%	0.94%
Two children within 3 years	0.003	0.002	0.005	0.003	0.000	0.000
	(0.003)	(0.002)	(0.003)	(0.002)	(0.007)	(0.005)
Mean	*0.030*	*0.030*	*0.030*	*0.030*	*0.040*	*0.040*
Effect as % of mean	10.28%	7.68%	16.77%	12.57%	-1.17%	-0.87%
Two children within 4 years	0.010*	0.007*	0.012**	0.009**	0.009	0.006
	(0.005)	(0.004)	(0.006)	(0.004)	(0.010)	(0.008)
Mean	*0.110*	*0.110*	*0.120*	*0.120*	*0.100*	*0.100*
Effect as % of mean	8.64%	6.45%	10.22%	7.66%	8.68%	6.47%
Two children within 5 years	0.021***	0.015***	0.028***	0.021***	0.004	0.003
	(0.006)	(0.005)	(0.007)	(0.005)	(0.012)	(0.009)
Mean	*0.200*	*0.200*	*0.210*	*0.210*	*0.170*	*0.170*
Effect as % of mean	10.13%	7.57%	13.11%	9.83%	2.52%	1.88%
Two children within 6 years	0.020***	0.015***	0.028***	0.021***	0.002	0.002
	(0.007)	(0.005)	(0.008)	(0.006)	(0.014)	(0.010)
Mean	*0.280*	*0.280*	*0.290*	*0.290*	*0.230*	*0.230*
Effect as % of mean	7.14%	5.34%	9.57%	7.17%	0.93%	0.69%
Two children within 7 years	0.017**	0.013**	0.022***	0.017***	0.008	0.006
	(0.007)	(0.005)	(0.008)	(0.006)	(0.015)	(0.011)
Mean	*0.330*	*0.330*	*0.350*	*0.350*	*0.280*	*0.280*
Effect as % of mean	5.08%	3.79%	6.48%	4.86%	2.99%	2.23%
Number of children	0.046***	0.034***	0.061***	0.046***	0.023	0.017
	(0.016)	(0.012)	(0.018)	(0.014)	(0.034)	(0.025)
Mean	*3.990*	*3.990*	*4.020*	*4.020*	*3.850*	*3.850*
Effect as % of mean	1.15%	0.86%	1.53%	1.15%	0.60%	0.45%
# of observations	105,175	105,175	82,305	82,305	22,870	22,870

Notes: Each coefficient comes from a different regression (robust standard errors in parentheses). The sample includes all mothers who gave birth ±120 days around January 1st, 2014. The dependent variable is an indicator for whether the mother gave birth to at least one or two additional children within 2,3,4,5,6 or 7 years after the birth of the reference child or total number of children; the main independent variable is an indicator for the reference child being born on or after January 1st, 2014. See Table 2 for the list of controls. *p<0.10, **p<0.05, ***p<0.01

Table 4. Effect of free universal preschool by mothers` birth year (Jewish subsample)

	Jewish subsample		Birth year<1980		Birth year>=1980	
	2SLS	Reduced form	2SLS	Reduced form	2SLS	Reduced form
	(1)	(2)	(3)	(4)	(5)	(6)
Preschool enrollment	0.734***		0.669***		0.760***	
	(0.005)		(0.010)		(0.006)	
Mean (comparison group)	*0.010*		*0.009*		*0.010*	
Child within 2 years	0.019**	0.014**	0.032**	0.021**	0.009	0.007
	(0.009)	(0.006)	(0.014)	(0.009)	(0.011)	(0.008)
Mean	*0.240*	*0.240*	*0.120*	*0.120*	*0.290*	*0.290*
Effect as % of mean	7.89%	5.80%	27.62%	18.47%	3.05%	2.32%
Child within 4 years	0.039***	0.029***	0.057***	0.038***	0.030***	0.023***
	(0.009)	(0.007)	(0.019)	(0.013)	(0.011)	(0.008)
Mean	*0.580*	*0.580*	*0.300*	*0.300*	*0.690*	*0.690*
Effect as % of mean	6.69%	4.91%	19.08%	12.76%	4.32%	3.29%
Child within 7 years	0.013	0.010	0.048**	0.032**	0.002	0.001
	(0.009)	(0.006)	(0.020)	(0.013)	(0.009)	(0.007)
Mean	*0.700*	*0.700*	*0.360*	*0.360*	*0.830*	*0.830*
Effect as % of mean	1.92%	1.41%	13.32%	8.90%	0.22%	0.17%
Two children within 5 years	0.034***	0.025***	0.007	0.005	0.035***	0.027***
	(0.008)	(0.006)	(0.011)	(0.007)	(0.010)	(0.008)
Mean	*0.210*	*0.210*	*0.070*	*0.070*	*0.270*	*0.270*
Effect as % of mean	15.93%	11.70%	10.06%	6.73%	13.01%	9.89%
Two children within 7 years	0.027***	0.020***	0.014	0.009	0.022*	0.017*
	(0.009)	(0.007)	(0.013)	(0.009)	(0.011)	(0.009)
Mean	*0.350*	*0.350*	*0.100*	*0.100*	*0.440*	*0.440*
Effect as % of mean	7.60%	5.58%	13.44%	8.99%	4.91%	3.73%
Number of children	0.080***	0.059***	0.075**	0.050**	0.061**	0.046**
	(0.022)	(0.016)	(0.033)	(0.022)	(0.025)	(0.019)
Mean	*4.040*	*4.040*	*4.250*	*4.250*	*3.960*	*3.960*
Effect as % of mean	1.99%	1.46%	1.76%	1.17%	1.54%	1.17%
Number of observations	61,829	61,829	17,674	17,674	44,155	44,155

Notes: Each coefficient comes from a different regression (robust standard errors in parentheses). The sample includes all Jewish mothers who gave birth ±90 days around January 1st, 2014. The dependent variable is an indicator of whether the mother gave birth to at least one or two additional children within 2,3,4,5,6 or 7 years after the birth of the reference child or total number of children; the main independent variable is an indicator for the reference child being born on or after January 1st, 2014. See Table 2 for the list of controls. *p<0.10, **p<0.05, ***p<0.01

Table 5. Effect of free universal preschool on fertility by birth parity of the reference child (Jewish subsample)

	Jewish subsample		Parity One		Parity two		Parity three	
	2SLS	Reduced form	2SLS	Reduced form	2SLS	Reduced form	2SLS	Reduced form
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Preschool enrollment	0.734***		0.701***		0.741***		0.753***	
	(0.005)		(0.009)		(0.009)		(0.007)	
Mean (comparison group)	*0.010*		*0.008*		*0.012*		*0.011*	
Child within 2 years	0.019**	0.014**	-0.001	0.000	0.028*	0.021*	0.023*	0.017*
	(0.009)	(0.006)	(0.019)	(0.013)	(0.015)	(0.011)	(0.012)	(0.009)
Mean	*0.240*	*0.240*	*0.350*	*0.350*	*0.180*	*0.180*	*0.190*	*0.190*
Effect as % of mean	7.90%	5.80%	-0.17%	-0.12%	15.55%	11.52%	11.85%	8.93%
Child within 3 years	0.033***	0.024***	0.017	0.012	0.047**	0.035**	0.029**	0.022**
	(0.010)	(0.007)	(0.019)	(0.013)	(0.019)	(0.014)	(0.014)	(0.011)
Mean	*0.450*	*0.450*	*0.640*	*0.640*	*0.360*	*0.360*	*0.380*	*0.380*
Effect as % of mean	7.28%	5.34%	2.67%	1.87%	13.26%	9.82%	7.66%	5.77%
Child within 4 years	0.039***	0.029***	0.032**	0.022**	0.051***	0.038***	0.031**	0.023**
	(0.009)	(0.007)	(0.016)	(0.011)	(0.020)	(0.015)	(0.014)	(0.011)
Mean	*0.580*	*0.580*	*0.790*	*0.790*	*0.500*	*0.500*	*0.480*	*0.480*
Effect as % of mean	6.69%	4.92%	4.06%	2.85%	10.14%	7.51%	6.36%	4.79%
Two children within 3 years	0.008**	0.006**	0.010	0.007	0.007	0.005	0.007*	0.006
	(0.004)	(0.003)	(0.008)	(0.006)	(0.006)	(0.004)	(0.005)	(0.003)
Mean	*0.030*	*0.030*	*0.050*	*0.050*	*0.020*	*0.020*	*0.020*	*0.020*
Effect as % of mean	28.69%	21.07%	22.15%	15.53%	34.37%	25.46%	35.76%	26.94%
Two children within 4 years	0.016**	0.012**	0.029**	0.020**	0.024**	0.018**	0.001	0.001
	(0.007)	(0.005)	(0.014)	(0.010)	(0.011)	(0.008)	(0.010)	(0.007)
Mean	*0.120*	*0.120*	*0.150*	*0.150*	*0.080*	*0.080*	*0.110*	*0.110*
Effect as % of mean	13.56%	9.95%	18.63%	13.06%	28.09%	20.81%	0.95%	0.71%
Two children within 5 years	0.034***	0.025***	0.038**	0.027**	0.038***	0.028***	0.027**	0.020**
	(0.008)	(0.006)	(0.017)	(0.012)	(0.014)	(0.010)	(0.012)	(0.009)
Mean	*0.210*	*0.210*	*0.270*	*0.270*	*0.160*	*0.160*	*0.210*	*0.210*
Effect as % of mean	15.95%	11.71%	13.86%	9.72%	24.52%	18.16%	12.81%	9.65%
Number of children	0.080***	0.059***	0.070*	0.049*	0.117***	0.087***	0.053	0.040
	(0.022)	(0.016)	(0.039)	(0.028)	(0.040)	(0.030)	(0.033)	(0.025)
Mean	*4.040*	*4.040*	*2.720*	*2.720*	*3.170*	*3.170*	*5.550*	*5.550*
Effect as % of mean	1.99%	1.46%	2.57%	1.80%	3.69%	2.73%	0.95%	0.72%
Number of observations	61,829	61,829	19,108	19,108	16,799	16,799	25,922	25,922

Notes: Each coefficient comes from a different regression (robust standard errors in parentheses). The sample includes all Jewish mothers who gave birth ±90 days around January 1st, 2014. The dependent variable is an indicator for whether the mother gave birth to at least one or two additional children within 2,3,4,5,6 or 7 years after the birth of the reference child or total number of children; the main independent variable is an indicator for the reference child being born on or after January 1st, 2014. See Table 2 for the list of controls. *p<0.10, **p<0.05, ***p<0.01

7 Appendix

Appendix A. Supplementary figures

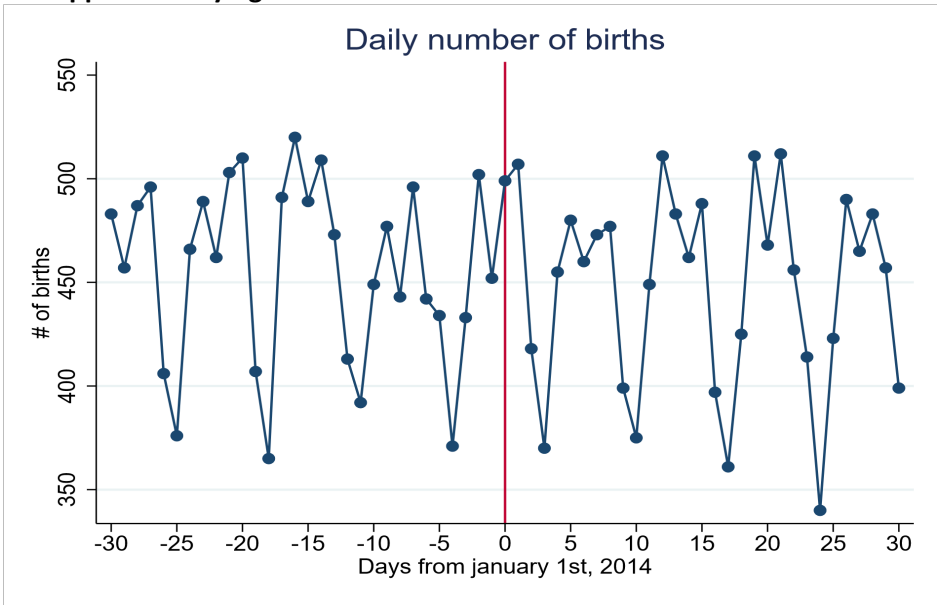

Figure A1. Daily number of births before and after the preschool cutoff

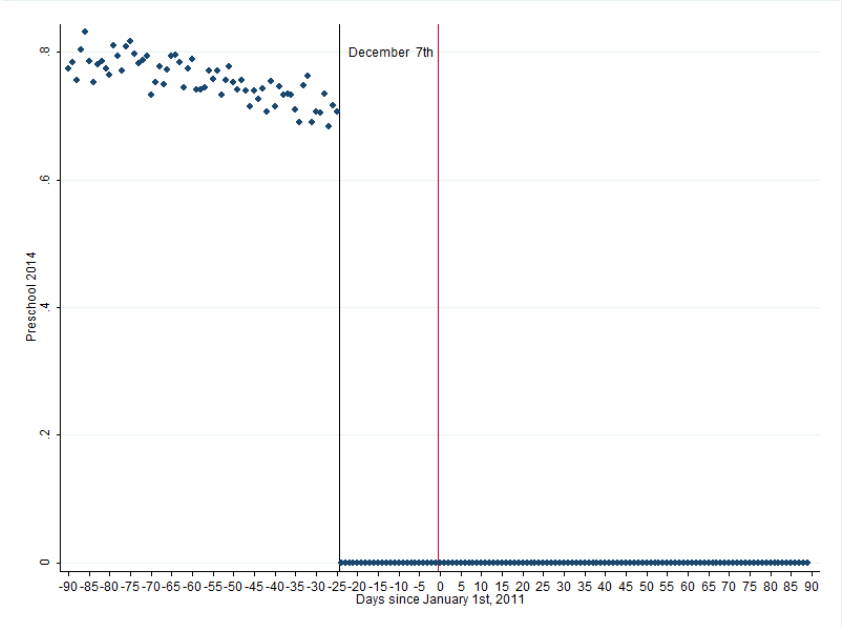

Figure A2. Preschool enrollment rates by child's date of birth (2014 school year)

Notes: The figure plots public preschool enrollment rates by distance (in days) between the child's birth date and January 1st in the 2014 school year. The vertical lines represent January 1st, 2011 and December 7th, 2010.

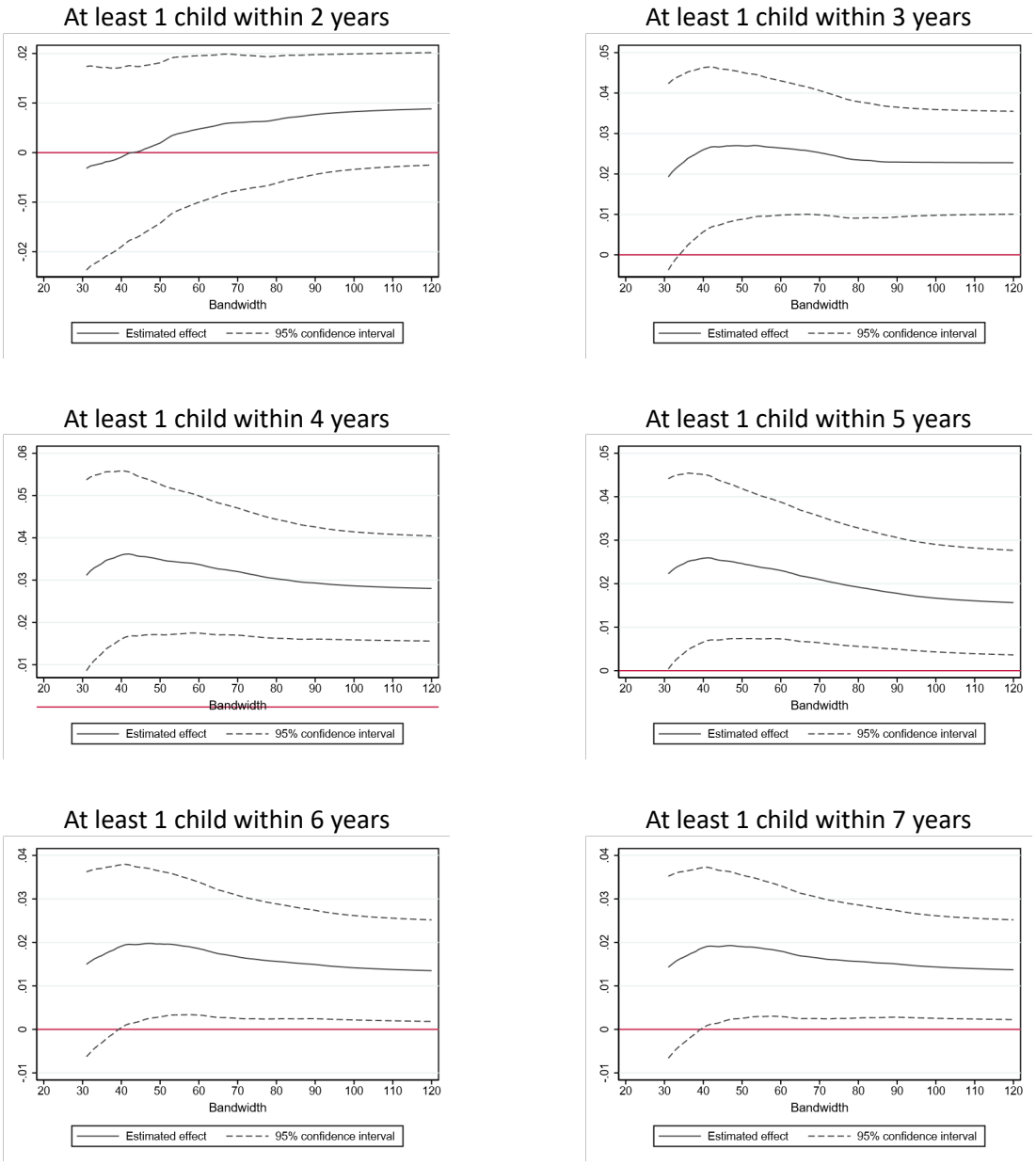

Figure A3. Effects on the likelihood of having at least one more child using different bandwidths

Notes: The line displays local weighted linear regression coefficients with triangular kernel varying the bandwidth (from 10 to 120 days before and after the threshold). The sample includes all mothers who had a child in a certain window (given in horizontal axis) of days around January 1st, 2014. The 95 percent confidence intervals are based on robust standard errors.

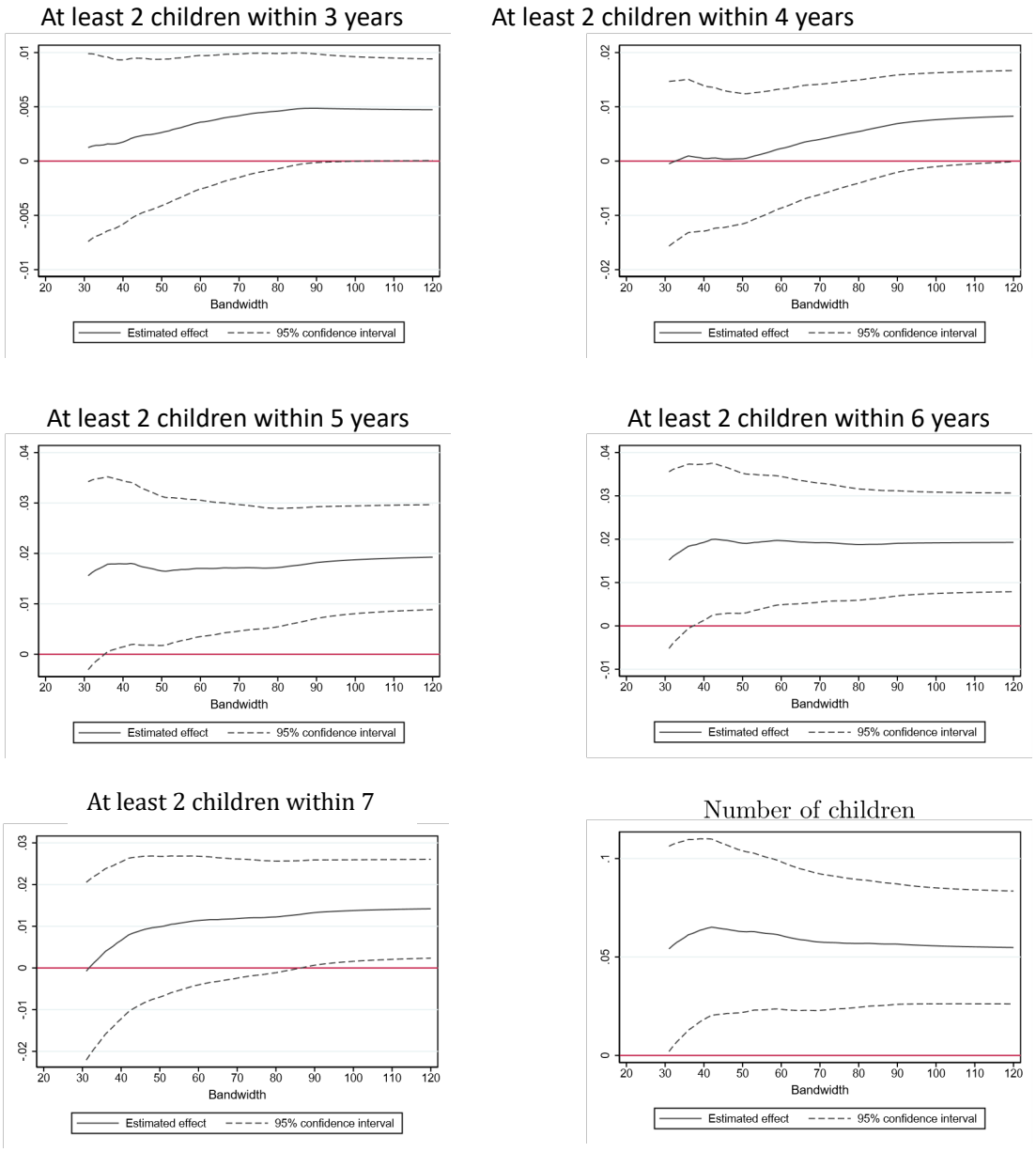

Figure A4. Effects on the likelihood of having at least two more children using different bandwidths

Notes: The line displays local weighted linear regression coefficients with triangular kernel varying the bandwidth (from 10 to 120 days before and after the threshold). The sample includes all mothers who had a child in a certain window (given in horizontal axis) of days around January 1st, 2014. The 95 percent confidence intervals are based on robust standard errors.

Table A1. Bunching in the number of births at the cutoff

	±7 days	±14 days	±24 days	±42 days	±56 days	±77 days	±90 days
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Daily number of births	8	12	12	10	3	-1	-2
	(25)	(15)	(10)	(7)	(7)	(6)	(5)
Mean	*447*	*449*	*458*	*458*	*458*	*460*	*461*
Linear trends	N	Y	Y	Y	Y	Y	Y
Quadratic trends	N	N	N	N	N	Y	Y
Day of the week	N	Y	Y	Y	Y	Y	Y
Number of days	14	28	48	84	112	154	180

Notes: Each coefficient comes from a different regression (robust standard errors in parentheses). The outcome variable is the number of children born on a particular date. The sample includes all days in the specified window around January 1st, 2014. The main independent variable is an indicator for the reference child being born on or after January 1st, 2014. Estimates reported in columns 2-7 control for a differential linear trend in date of birth (the running variable, centered at 0 in January 1st, 2014) at both sides of the cutoff. *p<0.10, **p<0.05, ***p<0.01

Table A2. Fertility effect of free universal preschool - reduced form from different specifications

	±90 days (1)	±21 days (2)	±56 days (3)	±77 days (4)	±120 days (5)	±90 days (donut) (6)	Local linear regression (7)
Child within 2 years	0.010*	0.002	0.006	0.008**	0.008	0.015**	0.008
	(0.006)	(0.006)	(0.007)	(0.006)	(0.005)	(0.007)	(0.006)
Mean	*0.24*	*0.23*	*0.23*	*0.23*	*0.24*	*0.24*	*0.24*
Effect as % of mean	4.38%	0.65%	2.71%	3.35%	3.29%	6.35%	3.24%
Child within 3 years	0.023***	0.021***	0.024***	0.019***	0.018***	0.024***	0.023***
	(0.006)	(0.007)	(0.008)	(0.007)	(0.005)	(0.007)	(0.007)
Mean	*0.44*	*0.42*	*0.44*	*0.44*	*0.44*	*0.44*	*0.44*
Effect as % of mean	5.18%	4.98%	5.45%	4.40%	4.05%	5.43%	5.23%
Child within 4 years	0.027***	0.024***	0.032***	0.026***	0.017***	0.023***	0.029***
	(0.006)	(0.007)	(0.008)	(0.007)	(0.005)	(0.007)	(0.007)
Mean	*0.56*	*0.55*	*0.56*	*0.56*	*0.56*	*0.56*	*0.56*
Effect as % of mean	4.88%	4.33%	5.74%	4.75%	3.05%	4.17%	5.24%
Child within 5 years	0.014**	0.015**	0.021***	0.015	0.008	0.008	0.018***
	(0.006)	(0.006)	(0.008)	(0.006)	(0.005)	(0.007)	(0.007)
Mean	*0.63*	*0.61*	*0.63*	*0.62*	*0.63*	*0.63*	*0.63*
Effect as % of mean	2.19%	2.48%	3.34%	2.48%	1.24%	1.28%	2.84%
Child within 6 years	0.013**	0.013**	0.017**	0.013	0.010*	0.008	0.015**
	(0.006)	(0.006)	(0.008)	(0.006)	(0.005)	(0.007)	(0.006)
Mean	*0.66*	*0.65*	*0.66*	*0.66*	*0.66*	*0.67*	*0.66*
Effect as % of mean	1.90%	1.96%	2.51%	1.98%	1.44%	1.16%	2.25%
Child within 7 years	0.013**	0.012**	0.017**	0.014	0.010**	0.009	0.015**
	(0.006)	(0.006)	(0.008)	(0.006)	(0.005)	(0.007)	(0.006)
Mean	*0.68*	*0.67*	*0.68*	*0.68*	*0.69*	*0.69*	*0.68*
Effect as % of mean	1.89%	1.82%	2.44%	2.01%	1.52%	1.27%	2.20%
Two children within 3 years	0.005**	0.003	0.005*	0.006**	0.002	0.006**	0.005*
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)
Mean	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*
Effect as % of mean	15.84%	9.75%	16.85%	18.55%	8.24%	18.82%	16.38%
Two children within 4 years	0.010**	0.000	0.005	0.009**	0.008**	0.012**	0.007
	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)
Mean	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*
Effect as % of mean	9.20%	0.21%	4.42%	8.10%	6.89%	10.77%	6.27%
Two children within 5 years	0.021***	0.013**	0.017**	0.017***	0.016***	0.024***	0.018***
	(0.005)	(0.006)	(0.007)	(0.006)	(0.004)	(0.006)	(0.006)
Mean	*0.2*	*0.19*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*
Effect as % of mean	10.33%	6.56%	8.55%	8.83%	7.92%	11.93%	9.14%
Two children within 6 years	0.019***	0.013**	0.020***	0.018***	0.015***	0.022***	0.019***
	(0.006)	(0.006)	(0.007)	(0.006)	(0.005)	(0.007)	(0.006)
Mean	*0.27*	*0.26*	*0.27*	*0.27*	*0.27*	*0.27*	*0.27*
Effect as % of mean	7.20%	5.06%	7.55%	6.56%	5.59%	8.20%	7.04%
Two children within 7 years	0.015***	0.007	0.013*	0.013***	0.013**	0.021***	0.013**
	(0.006)	(0.006)	(0.008)	(0.006)	(0.005)	(0.007)	(0.006)
Mean	*0.33*	*0.32*	*0.32*	*0.32*	*0.32*	*0.33*	*0.33*
Effect as % of mean	4.73%	2.31%	4.00%	4.14%	3.98%	6.33%	4.08%
Number of children	0.054***	0.043***	0.058***	0.055***	0.044***	0.046***	0.057***
	(0.014)	(0.016)	(0.019)	(0.015)	(0.012)	(0.017)	(0.016)
Mean	*3.98*	*3.97*	*4.00*	*3.98*	*3.96*	*3.98*	*3.98*
Effect as % of mean	1.36%	1.08%	1.45%	1.38%	1.12%	1.16%	1.42%
Linear trends	Y	Y	Y	Y	Y	Y	Y
Day of the week	Y	Y	Y	Y	Y	Y	Y
Personal controls	Y	Y	Y	Y	Y	Y	Y
Income controls	Y	N	Y	Y	Y	Y	Y
Previous children age groups	Y	N	N	Y	Y	Y	Y
Number of observations	81,264	19,039	50,469	69,485	108,337	75,435	81,731

Notes: Each coefficient comes from a different regression (robust standard errors in parentheses). The sample includes all mothers who gave birth in a certain window (given in column headers) of days around January 1st, 2014. The dependent variable is an indicator for whether the mother gave birth to at least one or two additional children within 2,3,4,5,6 or 7 years after the birth of the reference child or total number of children; the main independent variable is an indicator for the reference child being born on or after January 1st, 2014. See table 2 for additional controls. The "donut" specification excludes the 7 days right before and after the threshold. *p<0.10, **p<0.05, ***p<0.01

Table A3. Reduced form fertility effect of universal preschool effect - DID-RDD

	2SLS	Reduced form after official cutoff change	Reduced form before official cutoff change	Reduced form RD-DID
	(1)	(2)	(3)	(4)
Preschool enrollment	0.74***			
	(0.004)			
Mean (comparison group)	*0.029*			
Child within 2 years	0.006	0.007	0.002	0.005
	(0.011)	(0.006)	(0.006)	(0.008)
Mean	*0.23*	*0.23*	*0.23*	*0.23*
Effect as % of mean	2.72%	2.82%	0.99%	2.02%
Child within 3 years	0.023*	0.024***	0.008	0.017*
	(0.012)	(0.006)	(0.006)	(0.009)
Mean	*0.43*	*0.43*	*0.43*	*0.43*
Effect as % of mean	5.42%	5.61%	1.92%	4.01%
Child within 4 years	0.028**	0.027***	0.008	0.020**
	(0.012)	(0.006)	(0.006)	(0.009)
Mean	*0.55*	*0.55*	*0.55*	*0.55*
Effect as % of mean	5.06%	4.87%	1.47%	3.75%
Child within 5 years	0.021*	0.019***	0.005	0.016*
	(0.012)	(0.006)	(0.006)	(0.009)
Mean	*0.62*	*0.62*	*0.62*	*0.62*
Effect as % of mean	3.44%	3.08%	0.78%	2.55%
Child within 6 years	0.019*	0.017***	0.004	0.014*
	(0.011)	(0.006)	(0.006)	(0.008)
Mean	*0.66*	*0.65*	*0.66*	*0.66*
Effect as % of mean	2.88%	2.56%	0.58%	2.13%
Child within 7 years	0.013	0.016***	0.007	0.010
	(0.011)	(0.006)	(0.006)	(0.008)
Mean	*0.68*	*0.67*	*0.68*	*0.68*
Effect as % of mean	1.95%	2.43%	1.08%	1.44%
Two children within 3 years	0.004	0.004*	0.002	0.003
	(0.004)	(0.002)	(0.002)	(0.003)
Mean	*0.03*	*0.03*	*0.03*	*0.03*
Effect as % of mean	13.48%	14.22%	6.12%	9.98%
Two children within 4 years	0.005	0.006	0.002	0.004
	(0.008)	(0.004)	(0.004)	(0.006)
Mean	*0.11*	*0.11*	*0.11*	*0.11*
Effect as % of mean	5.15%	5.28%	1.91%	3.81%
Two children within 5 years	0.021**	0.018***	0.002	0.016**
	(0.010)	(0.005)	(0.005)	(0.007)
Mean	*0.19*	*0.19*	*0.19*	*0.19*
Effect as % of mean	11.49%	9.05%	0.95%	8.51%
Two children within 6 years	0.024**	0.019***	0.004	0.018**
	(0.011)	(0.006)	(0.006)	(0.008)
Mean	*0.26*	*0.27*	*0.26*	*0.26*
Effect as % of mean	9.22%	7.32%	1.49%	6.83%
Two children within 7 years	0.023**	0.015**	0.001	0.017**
	(0.011)	(0.006)	(0.006)	(0.008)
Mean	*0.32*	*0.32*	*0.32*	*0.32*
Effect as % of mean	7.11%	4.69%	0.25%	5.27%
Number of children	0.030	0.057**	0.016	0.022
	(0.027)	(0.028)	(0.028)	(0.020)
Mean	*3.98*	*3.96*	*3.98*	*3.98*
Effect as % of mean	0.74%	1.43%	0.40%	0.55%
Number of observations	42,588	21,838	20,750	42,588

Notes: Each coefficient comes from a different regression (robust standard errors in parentheses). The sample includes all mothers who gave birth ±24 days around January 1st, 2011 & 2014. See Table 2 for additional controls. *p<0.10, **p<0.05, ***p<0.01

Table A4. Educational expenses

	Jews			Arabs		
	no control variables	control variables	Local linear regression	no control variables	control variables	Local linear regression
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A - educational expenses 2016-2017 (2013-2014 cohort)						
Total education services expenditures	-1074***	-1005***	-1238***	59	-339	-206
	(373)	(345)	(308)	(267)	(400)	(136)
Mean	*2869*	*2869*	*2869*	*575*	*575*	*575*
Effect as % of mean	-37%	-35%	-43%	10%	-59%	-36%
Total private preschool expenditures	-1129***	-1219***	-1518***	-133	-134	4
	(269)	(250)	(247)	(128)	(155)	(57)
Mean	*1562*	*1562*	*1562*	*162*	*162*	*162*
Effect as % of mean	-72%	-78%	-97%	-82%	-82%	3%
Number of observations	277	277	277	63	63	63
Panel B - educational expenses without summer months 2016-2018 (2013-2015 cohort)						
Total expenditure on education services	-1089***	-1208***	-1254***	-106	-285	-28
	(301)	(273)	(274)	(291)	(291)	(144)
Mean	*2937*	*2937*	*2937*	*744*	*744*	*744*
Effect as % of mean	-37%	-41%	-43%	-14%	-38%	-4%
Total private preschool expenditures	-940***	-1122***	-1073***	49	-24	-14
	(222)	(204)	(225)	(126)	(149)	(68)
Mean	*1779*	*1779*	*1779*	*220*	*220*	*220*
Effect as % of mean	-53%	-63%	-60%	22%	-11%	-6%
Number of observations	423	423	423	83	83	83
Linear trends	N	Y	Y	N	Y	Y
Day of the week	N	Y	Y	N	Y	Y
Personal controls	N	Y	Y	N	Y	Y
Income controls	N	Y	Y	N	Y	Y
Previous children age groups	N	N	Y	N	N	Y

Notes: Each coefficient comes from a different regression (robust standard errors in parentheses). The sample includes all surveyed mothers who gave birth ±90 days around January 1st, 2014. The main independent variable is an indicator for the reference child being born on or after January 1st, 2014. See Table 2 for a list of controls. *p<0.10, **p<0.05, ***p<0.01

Appendix A. Data collection process and dataset overview

Demographic Characteristics

We obtained a comprehensive set of data from the Population Register, maintained by Israel's CBS, which includes information about all mothers and their spouses.[1] This dataset covers various important variables, such as the individuals' birth year, religious affiliation, education (highest degrees and years of schooling), country of origin, and year of immigration for individuals not born in Israel. Additionally, we have access to data on marital status (single, married, divorced, widowed) for all individuals within the dataset, spanning the years 2002 to 2020.

Income

Income data for 2002-2020 was obtained from a matched employer-employee database of income tax files. We have detailed income information for both mothers and their spouses, including gross income (divided into self-employed and wage earner categories), the number of months worked (indicated for each month of the year), the number of jobs held, income tax, mandatory health insurance, and social security contributions.

Fertility History

We obtain information about the individuals' number of children and their dates of birth based on birth-certificate data.

Public Care Enrollment

We merged the database with an additional administrative file obtained from the Ministry of Education. This supplementary file contains information regarding all children enrolled in public care settings from 2008 to 2020.

Education Expenditure

As part of our investigation, we used the CBS Expenditure Survey data on the category "total education services expenditure."[2] Additionally, we created a new variable that summarizes the total expenditure on private preschool, daycare, nursery school, and nanny services (provided at the nanny's home)[3]. We called this variable "total private preschool expenditure." We relied on the responses of individuals in our sample during the last quarter of 2016 and the first three quarters of 2017. During this period, parents of children born in October-December are entitled to free

[1] If the couple is married, we have the information about the woman's registered husband. If the couple is cohabitated (a phenomenon uncommon in Israel), we have the information about the woman's spouse if they share a child.

[2] This variable includes various educational expenses, including tuition fees, materials, books, and various educational programs and activities.

[3] Expenditure on these services were available in two different questions in the survey "Expenditure on daycare, nursery school, and nanny services" and "Expenditure on private kindergartens".

universal preschool, while parents of children born in January-March are not. The data on expenditures for educational services were provided in an aggregated form for each household. This means that the measurements reflect the total educational expenditures of the entire household rather than a particular child within the household.