

DISCUSSION PAPER SERIES

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ABSTRACT

Parental Employment Effects of Switching from Half-Day to Full-Day Kindergarten: Evidence from Ontario's French Schools*

Full-day kindergarten programs are expanding across North America, driven by a policy focus on early childhood development. These programs also affect parents' budget sets and may lead to changes in labour market outcomes. We exploit the unusual nature of Ontario's government school system to examine parents' labour supply response to a move from half-day to full-day kindergarten in Ontario's French – but not English – schools. We find no robust evidence of labour supply effects for fathers in two parent families, and only some limited and modest effects on mothers in two parent families. For single mothers, the point estimates suggest large and statistically significant effects on employment and hours of work, and in particular for working longer hours.

JEL Classification: I28

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1. Introduction

Early childhood care and education programs are increasingly touted as routes to improve children's educational outcomes and their longer run life prospects. One specific policy that has been promoted is the extension of kindergarten programs from half- to full-day. In the United States, full-day kindergarten has increased from approximately 20 percent in the early 1970s to over 70 percent in 2010 (Gibbs, 2014a). A similar but slightly later expansion has occurred in Canada. The provinces of British Columbia and Ontario recently extended kindergarten programs from half-day to full-day programs, following earlier expansions by Nova Scotia, New Brunswick and Quebec. Although the key rationale for introducing full-day kindergarten programs has been to give children "a solid foundation for future learning," improved family employment and income is often identified as a side benefit, and associated increases in tax revenues as a way to fund the programs. This paper directly measures the impact of increasing kindergarten programs from half- to full-day on parental labour market outcomes.

Studies of subsidized early child care have found increased family labour supply to be one of the key benefits. Labour supply effects have been examined for a range of programs, most notably for kindergarten and pre-kindergarten programs in the U.S. (Gelbach, 2002; Cascio, 2009; Cascio and Schanzenbach, 2013; Fitzpatrick, 2010; Fitzpatrick, 2012; Herbst, 2017), for subsidized day care (Baker, Milligan and Gruber, 2008; Lefebvre and Merrigan, 2008; Lefebvre, Merrigan and Verstraete, 2009; Haeck, Lefebvre and Merrigan, 2015), and for other child care subsidy programs (Hardoy and Schone, 2015).

However, there are reasons to think that lengthening the school day may affect labour supply decisions differently than reducing the costs of child care or of introducing a half-day program. Cascio (2009) and Gelbach (2002) have both pointed to the fact that the introduction of universal, free kindergarten should

lead to both substitution effects and income effects. These will have different consequences for parents who would have worked regardless of the presence of kindergarten than those who would not.¹ Half-day programs may be particularly difficult to combine with work – particularly full-time work – given that they typically last for less than three hours per day, providing rather limited time for work without securing additional wrap around child care. In that case, moving to a longer day might increase parental work. On the other hand, if parents face few fixed costs to working, lengthening the kindergarten day would be expected to have a more noticeable effect on the intensive margin, increasing hours of work with perhaps little effect on the probability of working. Finally, there may be offsetting income effects from cheaper child care that may cause a substitution away from earning income towards increased parental leisure.

There is limited empirical research on the labour supply effects of moving from half- to full-day kindergarten.² In the United States, there is some evidence on this from Gibbs (2014a, 2014b) and Cannon, Jacknowitz and Painter (2006). Cannon et al. (2006) estimates the likelihood that a mother would work full-time if their child attended full-day kindergarten, finding no statistically significant effects for mothers' employment when their child was in first or third grade. Gibbs (2014a and 2014b) use a policy change in the state of Indiana and finds suggestive evidence of increase in maternal employment. In Canada, Haeck et al. (2015) consider the effects of a switch from half-day to full-day

¹ In the context of this paper, the income and substitution effects may have different magnitudes between the Francophone and Anglophone families because they might have different constraints and opportunities for childcare.

² There is a large literature on the effect of full-day kindergarten on child outcomes such as early literacy and numeracy. However, much of the effect fades out in early elementary grades (see Warburton, et al., 2012; Cannon, et al., 2006; Lee et al., 2006, Votruba-Drzal et al. 2008 and DeCicca, 2007, for examples).

kindergarten in Quebec and find no significant labour market response of affected parents. They suggest (p. 32) that “implementing full-day kindergarten alone was not enough to increase maternal labour force participation and weeks worked, but when combined with the low-fee daycare program it was.”

However, their strategy relies on being able to separate out the effects of full-day kindergarten from a raft of other – arguably more important – policy changes introduced at the same time in Quebec, which may make it difficult to reliably estimate parental labour supply responses. Finally, using the change from half- to full-day kindergarten in the English language system in Ontario in the 2010s, Dhuey, Lamontagne and Zhang (2019) find small but significant positive effects of switching on hours worked for non-immigrant mothers of only one child with lower education levels.

In this paper, we use the master files from the Canadian Census to examine whether the extension of kindergarten programs in Ontario’s French language schools – but not its English language schools – from half-day to full-day over the late 1990s to the early 2000s led to an increase in the labour force participation, employment rates, and working hours of parents with kindergarten-aged children who were eligible to attend those schools. We examine whether there is evidence of a difference between the change in hours of work of parents of children eligible to be schooled in the French language system following the introduction of full-day kindergarten in their local school district compared with the change in hours worked of parents living in the same region, but whose children could not attend a French language school.

This policy change is a particularly attractive case to study, since unlike other policy changes that have been studied, including the subsidization of public kindergarten in the US (Cascio, 2009; Herbst, 2017) and the provision of subsidized day care and the related extension of kindergarten from half-day to full-day in Quebec (Baker, Gruber and Milligan, 2008; Lefebvre and Merrigan, 2008; Haeck et al., 2015;

Dhuey, Lamontagne, and Zhang, 2019), the program affected only a small proportion of parents in identifiable (Francophone) families in the geographic areas where it was introduced. Consequently, we can control for local labour market conditions in a way that is not possible in most similar studies. Availability of half-day kindergarten was universal prior to the change and take up rates for kindergarten were already very high, so any effects can be associated with a longer day rather than the availability of kindergarten. Moreover, it is very difficult for non-Francophone families to switch their children into French language schools, limiting the possibility that endogenous choices of parents to switch schools affect our estimates.

We do not find robust evidence of a labour market response to the introduction of full-day kindergarten for parents in two parent families. Our point estimates of the responses of single mothers find large effects on employment and hours of work.³ The notion that single mothers may be more responsive to changes in child care availability and costs is consistent with findings of Cascio (2009) and Fitzpatrick (2009). The results also agree with the conclusion of Haeck et al. (2015) and Dhuey, Lamontagne, and Zhang (2019) that expanding kindergarten from half-day to full-day does not appear to have very large overall labour market effects in and of itself.

The paper proceeds as follows. Section 2 describes Ontario's school system, and the background to the switch from half-day to full-day kindergarten. Since this switch affected a very specific sub-group of Ontario's population – parents in families with at least one adult who knows French – in Section 3 we describe the key characteristics of this population. Section 4 presents our key estimating equations and

³ We are unable to estimate effects for single fathers because the number of single fathers who report knowing French is too small for the results to be reliable.

our data sources. Section 5 shows the results, including for alternative samples (and therefore alternative control groups). Section 6 concludes.

2. Full-day kindergarten in Ontario's French schools

Ontario's K-12 school system, like most others in North America, comprises a government-funded sector and a private sector. The private sector receives essentially no public funding, and the percentage of Ontario's K-12 students who attend private schools is generally below ten percent.⁴

In common with other North American jurisdictions, each of Ontario's public schools has an associated catchment area, with limited ability to attend a public school outside one's own catchment area.

Unusually, however, Ontario has four separately-managed fully government-funded school systems: an English public, English Catholic, French public, and French Catholic system. Within each system, there are a number of boards (districts), which are non-overlapping and cover the bulk of the province. There are twelve French language boards (four public and eight Catholic) and 60 English language boards (31 public and 29 Catholic). As a result, most home locations fall into the catchment area of a school run by each of the four types of school board. Enrolment in Catholic schools is preferentially available to students who have been baptized Catholic. Enrolment in French language schools is largely restricted to children who have at least one parent who has a good working knowledge of French. Specifically, a parent is eligible to send their child to a French language school if:

- French is their first language and they still understand it;

⁴ See <http://www.edu.gov.on.ca/eng/educationFacts.html> for public enrolment and <http://www.ofis.ca/> for private enrolment.

- they were educated primarily in French in Canada;
- the child has previously been educated in French in Canada; or
- by application to the school board, which typically requires that at least one parent and the child have a reasonably strong knowledge of French.⁵

As a result, children who have at least one parent whose mother tongue is French, and who are Catholic, can choose to enroll in any of their four local schools. French language schools do allow enrolments of students without French language education rights on application, but this application process is intended to ensure that at least one parent knows French. Around six percent of elementary school students attend French language schools.

Children are required to enroll in the first grade of school in September of the calendar year in which they turn six. For many decades, Ontario has had two optional years of pre-school education: junior kindergarten/*maternelle* (JK), and senior kindergarten/*jardin* (SK). JK programs were first offered in 1944 and were available to students in all government schools over the period we are studying. When the programs began, both JK and SK were half day (between two and a half to three hours each weekday). Parents would need to either pick their child up from school or drop them off at school during the middle of the regular work day, since wrap around day care provided at the schools was rare. Arranging this could be quite difficult for working parents. Although it is optional, kindergarten has

⁵ The application process typically which involves completing an application form in French and sitting for an interview which assesses ability of the child to succeed in a fully French environment, including criteria such as whether French is spoken at home, whether the child shows that they understand French, whether French is spoken in the neighbourhood, whether the parents are able to communicate effectively in French, and why they want their child educated in French. See here for an example: https://www.ecolecatholique.ca/en/Who-Can-Attend_7

long been extremely popular in Ontario, with enrolment rates of 75 percent for JK and 90 percent for SK in 2001.⁶

Ontario's French language school boards, which educate between five and six percent of Ontario's elementary students, introduced full-day kindergarten program at various times between the late 1990s and early 2000s (Table 1), although some boards offered full-day SK earlier than that. The two school boards which cover the Toronto region – the Catholic *Conseil Scolaire de district Catholique Centre-Sud* and the public *Viamonde* district – were the first to introduce full-day kindergarten at the JK level, in 1998-99. The latest school board to change to full-day kindergarten, in 2002-03, was the public *Conseil des École Publique de l'Est de l'Ontario (CEPEO)*, which covers Ottawa. The Catholic *Conseil Scolaire de District Catholique de l'Est Ontarien* which covers only the part of the province to the east of Ottawa and has a large Francophone population, started in 2001-02. Figure 1 maps the location of the school boards in Ontario.

The move to full-day kindergarten in the French-language schools was motivated by the goal of improving academic achievement among students who were studying in the French language while living in a mostly English environment. Students in the full-day program kindergarten spend the same amount of time in school as regular elementary students, roughly six and a half hours. It was thought that providing a longer time period of immersion in the language of instruction would boost language skills as well as improve students' ability to learn in other subject areas (Herry, Maltais and Thompson, 2007). The decision was taken as part of a general curriculum review by the French language boards as

⁶ Based on enrolment data from the Ontario Ministry of Education (<https://www.edu.gov.on.ca/eng/general/elemsec/quickfacts/2000-01/quickFacts00-01.pdf>) and population data from Statistics Canada (CANSIM series v468741 and v468807)

a group, with agreement from the provincial government, rather than being a policy change pushed by the provincial government.

There is no reason to think that local labour market concerns, nor concerns about employment of the Francophone population, drove the shift to full-day kindergarten, nor any other coincident policy change. We have not found any discussion at the time which suggests there was any consideration given to making it easier for parents to work, nor that the move was a response to parental demands.

Moving to a full-day program meant that the facilities and teachers required to support the same number of students in JK and SK would roughly double. This could have put pressure on school resources, perhaps reducing the number of students that these schools were willing to enroll. But the number of students enrolled in French language elementary schools (JK-Grade 8) declined slightly between 1991-92 and 2006-07, after which there was a steady rise. It is unlikely then that there were significant capacity constraints in the French language school system as a whole around the time that full-day kindergarten was introduced in the late 1990s and early 2000s.

Full-day kindergarten has now been rolled out to all schools across the province, starting in 2011. This policy also affected the French language schools, which received additional funding and were required to comply with new curriculum and staffing regulations introduced at the same time. This more recent policy change was accompanied by a discussion of possible labour supply effects, likely a result of the well-publicized research into Quebec's day care program. This change is outside the scope of this study.

3. Characteristics of Ontario's French-speaking population

In this paper we examine the labour market effects of the introduction of full-day kindergarten on a relatively small and specific subgroup of the Ontario population - parents whose children are eligible to

attend French language schools. There is a possibility that our estimates of the effect of full-day kindergarten on labour market outcomes could be an artifact of different outcomes or trends for this group relative to the rest of the Ontario population. In this section, we discuss the key differences between Ontario's French speaking population relative to the broader population. We conclude that, other than location (which we control for), the differences between the groups are not likely to affect our estimates of the effect of the policy change.

We use three different identifiers of eligibility for French language schooling in this paper. The broadest is any household with one adult reporting a knowledge of French. This comprises roughly twelve percent of single mother households in our sample, and eighteen percent of two parent households. The second identifier is households that have one adult reporting French as their home language. The third identifier we use is households that report at least one adult reporting French as their mother tongue. These two group are smaller, roughly six percent of single mother households in our sample and just under ten percent for two parent households.

Table 2 shows summary statistics for 25- to 45-year-old parents of children of JK or SK age by parent type and by each of these French language groups. Those who report a mother tongue as French are fairly similar to those who report no French knowledge on the part of at least one adult in the family. Those who have an adult in the family who reports a knowledge of French have higher education levels and labour supply than those with no French knowledge reported, probably an indicator that French as a second language proficiency is correlated with higher education.

The key difference between the parents in families that report some French knowledge and those that do not, however, is region of residence. Francophones are 17.7 percent of the population in Ottawa Census Metropolitan Area, and 17.4 percent of the population around the Sudbury and Thunder Bay areas. They

are also more likely to live outside a city than are Anglophones, forming 7.5 percent of the non-city population. On the other hand, less than two percent of the population of the southern Ontario cities of Toronto, Hamilton, Kitchener, London and Brantford is Francophone. As a result, the northern school boards such as the *CSD du Grand Nord*, account for a much larger share of Ontario's Francophone population than they do its non-Francophone population, while southern boards like *Viamonde* are the opposite (Table 1). Francophones are much more likely to be Catholic than other Ontarians, which explains the larger number of French Catholic than French public school boards and schools.

4. Estimation strategy and data

The key policy change on which we focus is the switch from half-day kindergarten programs to full-day programs for JK and SK that occurred at varying times in Ontario's French language school boards in the years between 1998 and 2004. This gives us a quasi-experiment that is ideal to identify the effect of full-day kindergarten on labour market outcomes for parents with children eligible to attend a French language school relative to those without.

In order to estimate this model, we need a data set that: (1) has information on labour market decisions; (2) can identify the 'treated' group - which requires information on a family's language and location of residence and children's ages; and (3) has a large enough sample that it contains a reasonable number of treated individuals. The last is particularly important since the policy change affected only a relatively small population – parents of four- to five-year-old children eligible to be educated in French. The only data set that meets these criteria is the master files of the Canadian Census. We use data from the Censuses of 1991, 1996, 2001 and 2006, which span the roll out of full-day kindergarten in the French language school boards. The master files contain the key information we need to identify the 'treated' group: the ages of children in the household, knowledge of languages for all members of the household,

and the location of the household at the Census Sub-Division level. It also contains information on the labour force activity of parents in the week the Census was undertaken (May of the Census year), as well as weeks worked for the prior calendar year.

Below, we first spell out in more detail our empirical strategy, then describe in more detail how we apply the Census data to this strategy to obtain our estimates.

4.1 Empirical Strategy

Our baseline estimating model using individual-level data, estimated on a sample that includes only parents of children of kindergarten age, is:

$$O_{ict} = \delta(F_i \times P_{ct}) + \gamma' X_{ict} + \rho F_i + \eta P_{ct} + \theta_t + \gamma_c + \varepsilon_{ict} \quad (1)$$

Our measures of labour market outcomes for parent in family i in Census sub-division c , in year t , O_{ict} are parental labour force participation, employment, weeks worked, and hours worked per week. F_i is a measure of French-school eligibility, which we discuss in more detail below. P_{ct} is the post-treatment variable, taking a value of 1 for anyone living in a census subdivision, c , that has a local French school in a year t , when it offers full-day kindergarten. This variable is at the CSD level not at the individual level, therefore it will take the value of 1 regardless of whether the parent has children who are eligible to attend a French school. We include this variable as a control in our regressions. X_{ict} is a set of controls that includes indicators of education level of the parent, age of youngest child in the family, an indicator for the presence of older children in the family, and a quadratic in parental age. θ_t and γ_c are year and Census subdivision fixed effects.

We estimate the model using ordinary least squares, with standard errors robust to arbitrary forms of heteroskedasticity. We do not use clustered standard errors. Clustering has been used in difference-in-

differences models primarily to deal with serial correlation in the data. Here, however, we have only four years of data, which makes our estimation strategy similar to the aggregation strategy recommended for dealing with serial correlation by Bertrand, Duflo and Mullainathan (2006). In addition, unlike most difference-in-differences strategies, we do not have a single group in a particular geographic area affected by the policy change. Serial correlation within a particular geographic area is therefore less of a concern here than in other policy experiment studies.

The key coefficient of interest, δ , is the estimated effect on the labour market outcome of moving from half-day kindergarten to full-day kindergarten. It is the estimate on the interaction between having a child eligible for full-day kindergarten (the variable that identifies the treatment group), F_i , and the availability of full-day kindergarten in the area in which the parent lives (the variable that identifies when treatment has occurred in a particular region), P_{ct} . Note that the estimates are effectively intent-to-treat – they are estimates of the availability of full-day kindergarten in a nearby French school on the labour force activity of parents whose children are eligible for full-day kindergarten, not on a forced switch into full-day kindergarten for all parents.

4.2 Data

For this study, we use the Censuses of 1991, 1996, 2001 and 2006, which cover the period of our main policy changes between 1998 and 2002. The key labour market outcomes we examine are: weeks worked in the calendar year before the Census, hours worked in the week prior to Census day, and whether an individual was in the labour force or employed in the week prior to Census day. Since the Census is held in mid-May, just over eight months will have passed between the start of kindergarten for a JK-aged child, and just over 20 months for an SK-aged child. We expect that this gives time for parents to adjust their labour supply decisions to account for the effects of kindergarten availability.

Weeks worked, however, will include a period of around eight months in which parents of JK aged children would have had the same kindergarten day in French schools as in English schools. For parents of SK children, kindergarten would have begun four months before the start of the calendar year for which weeks worked is measured. It will therefore not reflect a full adjustment for around half of treated parents.

The main data issue is identifying which parents are eligible to send their children to French language schools in Ontario. The Census offers several ways that can identify such parents. The first possibility is to identify as French-school eligible a family in which any child is reported as having French as a mother tongue. These children would clearly qualify for French language schooling, but we are concerned that if a parent chose to switch their child into a French language school to take advantage of the ability to use full-day kindergarten then this would make them more likely to report French as a mother tongue. In that case, we would expect results using that treatment group to overestimate the causal effects of full-day kindergarten on labour market outcomes, since parents who were in any case more attached to the labour market would have more of an incentive to switch their child into a French school.

The second option is to identify as French-school eligible a family in which any adult member reports that the family uses French in the home. Here too, we are concerned that families that choose to send their children to a French school may be more likely to report their home language as French, leading to similar problems.

A third option is to identify a parent as having a child eligible for French language education if at least one of the adults in the family reports that French is their mother tongue. However, this excludes from

the eligible group a large number of parents who have a strong enough knowledge of French that their children would be accepted into French language schools.

The last option, which we use as our baseline, is to use as our main indicator of French-school eligibility whether one adult in the family reports a knowledge of French. This gives us a group that is likely more comparable with actual families of children attending French language schools (particularly in Southern Ontario) than the alternative of including only those families who report using French as a home language. It also gives us a considerably larger sample of potentially treated parents than the other options. However, this group includes parents who are less likely in general to send their children to French language schools than those who are native French speakers, which may mean that our treatment group includes parents who would not be truly affected by the policy change, potentially leading our intent-to-treat estimates to understate the effect of treatment on the treated.⁷ We therefore include results using two other narrower definitions of French language eligibility: home language is reported as French, and at least one adult in the household reports French as a mother tongue.

Summary statistics for each of the main samples used in the paper by parent type and by French-school eligibility definition, are in Table 2.

The second key variable we need to construct is P_{ct} . Since the timing of availability of full-day kindergarten differed across school boards (Table 1), we need to first match each family to the relevant French-language Catholic and public school board. The finest geographic detail we have available to

⁷ A similar concern is that since some parents might choose not to use kindergarten at all regardless of whether it is offered on a full-day or half-day basis. We do not have any good estimates of the effect of a switch from half-day to full-day kindergarten on kindergarten take-up rates. The estimates in this paper should be seen as intent-to-treat estimates. That said, a very large proportion – more than three quarters – of eligible children do attend kindergarten.

use for parental residence is the Census Sub-Division (CSD) level. We match each of Ontario's CSDs to the corresponding French Catholic and public boards.⁸ For CSDs that have access to both a French Catholic and a French public school, we assume that families have French language schooling available from the earliest time that one of the two school boards switched to full-day kindergarten. Although the maps in Figure 1 make it appear that the boards cover all of Ontario, this does not accurately reflect the reality that many Ontarians live too far from a French language school to make it realistic that a child could attend the school to which they would notionally be assigned.⁹ In order to be able to attend a French language school, we require that the trip time to get to a French language school from a particular CSD be no more than 40 minutes.¹⁰ All of the main cities and larger towns (of 100,000 people or more) in Ontario have nearby French language schools, typically several. But around four percent of francophone families live sufficiently far from a French language school that they are never able to effectively access full-day kindergarten.

⁸ There are some CSDs which have sub-areas within the boundaries of two or more different boards of the same type. These are relatively rare and cover a very small proportion of the Ontarian population, or of the Francophone population. Where this occurred, we assigned the CSD to the board containing a French language school that was closest to the CSD's major population centre.

⁹ There are four areas that have limited access to French language schools (1) the corridor between roughly Port Hope and Cornwall and their hinterlands (there are only three French schools in this region: one in Kingston and two in Trenton); (2) South-West Ontario from roughly north-west of Stratford in the south west to Owen Sound in the north and Borden in the east; (3) from Parry Sound stretching in the direction of Ottawa; and (4) large swathes of Northern Ontario (though these are relatively unpopulated).

¹⁰ We also used a specification that defined having access to a French language school as living in a CSD with a French language school. By this stricter definition of distance to school, four percent of French-school-eligible households could access full-day kindergarten in 1996, 67.5 percent in 2001, and 75 percent in 2006. Results are in Appendix Table A2.

Using the Census has the disadvantage that we have data only at five-year intervals, so we are less able to rely on differences in the timing of the roll out of full-day kindergarten by geographic region than we would be able to if we had annual data available. That said, some variation in the availability of full-day kindergarten in different regions in the same year remains. At the time the 1991 Census was held, there was no full-day kindergarten available. By the 1996 Census, two French language boards had begun offering full-day kindergarten, though only at the SK level, covering 4.5 percent of parents of kindergarten-aged children with at least one parent reporting a knowledge of French. At the time of the 2001 Census – which aligns with the 2000-01 school year – 86.5 percent of parents of four and five-year-old children with at least one parent reporting a knowledge of French had access to full-day kindergarten through their local schools. By the 2005-06 school year, all four- and five-year-olds in French schools were in full-day programs, covering around 96 percent of parents with French knowledge. The remaining around four percent of parents with French knowledge could not access full-day kindergarten because they did not have a French language school nearby.

The group of adults who did not have children with access to full-day kindergarten in any given year is somewhat heterogeneous. It includes anyone who does not have a youngest child aged four or five by the end of the prior calendar year. It includes anyone in a family which has no adult members reporting a knowledge of French (non-Francophone families). A number of families live too far from a French language school to make the daily commute worthwhile, so it also includes adults who would be French school eligible but did not ever have access to any full-day kindergarten. And finally, it includes French-school eligible adults whose children were aged four or five before their local French language school introduced full-day kindergarten.

5. Results

5.1 Comparing labour market outcomes of French-school eligible parents of kindergarten aged children with non-French-school-eligible parents

Our base specification includes in the sample parents in Francophone and non-Francophone households aged 25 to 45 whose youngest child is aged four or five by December 31 of the year before the Census was held. In this specification, any effects of either general labour market conditions at the local level or changes in government policies that affect parents with young children are controlled for. Other than school board policies, there are no government programs in Ontario that affect parents of young children in French-school eligible households differentially, so controlling for common year effects across these groups seems appropriate.

We compare labour market characteristics of parents whose children are eligible to attend full-day kindergarten to parents whose children are not. Again, the latter group includes French-school eligible parents living in a CSD with a nearby French school before the school introduced full-day kindergarten, French-school eligible parents with no local French school, and non-French school eligible parents. The estimates can be considered a weighted average of a set of difference in differences estimates comparing each combination of group and period (Goodman-Bacon, 2018). The majority of our changes in full-day kindergarten availability occur from 1996 to 2001 (82 percent) and 2001 to 2006 (ten percent), so these periods weigh more heavily in our estimates.

The baseline results are shown in Table 3, by outcome measure (each column is a separate labour market variable), by definition of French-school eligibility, and by each of three parent types – women

in single parent households, women in two parent households and men in two parent households.¹¹ We only show here the estimates and standard errors on the treatment variable δ in equation (1)¹².

Using the definition of French-school eligibility based on whether any adult in the family reports knowing French, the estimates suggest generally small effects. There are economically moderately small and – with two exceptions – statistically insignificant estimates of the effect on labour supply of men in two parent households. There are some more consistent statistically significant estimated effects of full-day kindergarten availability on women in two parent families. Women in two parent households that are affected by the policy increase employment rate by more than two percent compared to those who are not affected by the policy. There also is an increase in hours worked of about an hour per week. Weeks worked are also estimated to be higher for those with full-day kindergarten available.

Women who are single parents have similar point estimates to women in two parent families, with a moderate estimated boost to labour supply across the board. However, with a much smaller sample size, these are not statistically significant. For both single mothers and mothers in two parent families, the estimates here suggest some increase in hours worked at the longer end of the spectrum. We noted earlier, however, that these estimates could be biased downwards, since our definition of the treated group might include a large group who know French, but not well enough that they would generally consider sending their children to French school.

¹¹ There was not a sufficiently large sample of treated single fathers to make estimation for that group reliable.

¹² Complete regression results for one of the baseline specifications are available in Appendix Tables A1a-A1c.

Using the home language as our indicator of French-school eligibility, the estimates are generally similar for men and women in two parent families, although any increase in employment for women in two parent families now appears to come mostly at the lower end of the spectrum (less than fifteen hours per week). For single mothers, the point estimates suggest a bigger labour supply response, and become statistically significant. There is stronger evidence of a move towards longer hours of work. The point estimates, for instance, suggest an increase of 7.5 percentage points in employment, compared with an average for this group after 1996 of 75 percent. As opposed to underestimating the effects in our previous definition of the treated group, here we would expect a possibility of the estimates for this group to be biased towards reporting greater labour supply. This could occur if, for instance, a single mother who is working switched her child to a French language school as a response to the introduction of full-day kindergarten and was subsequently more likely to report that her home language was French. Finally, the results based on at least one adult in the family reporting a mother tongue of French show somewhat stronger labour supply effects across the board, including some possible effect for men in two parent families. For single mothers, the estimated effect on employment is now 9.3 percentage points, with a mean rise in hours of four hours per week, mostly coming from a rise in the proportion of mothers working more than fifteen hours per week. For mothers in two parent families, the estimates suggest a four-percentage point rise in employment, and an increase in hours of work of one hour per week on average, with increases in the share of women working one to fifteen hours per week as well as over 30 hours per week. This group would certainly be eligible to send their children to a French language school, and there is not much reason to think that sending one's child to school would change one's propensity to report French as a mother tongue. In some senses, then, these estimates are perhaps the closest to a true intent-to-treat effect. However, the definition excludes quite a large proportion of

the population of French-school parents, particularly in Southern Ontario, and the sample sizes are quite small.

5.2 Comparing labour market outcomes of French-school eligible parents of kindergarten aged children with French-school-eligible parents of eight- or nine-year-children

A second strategy takes the same three treatment group definitions as previously, but instead of using non-French school eligible parents of kindergarten aged children as the control group, it instead uses French-school eligible parents of children aged eight or nine (roughly, grade three or four), excluding any parent whose eight- or nine-year-old children could have received full-day kindergarten at some earlier point.¹³ This may be helpful if we want to ensure that we better control for French-specific labour market developments, and are less concerned about whether there are differences in labour market outcomes by the age of the youngest child in the family. The estimating equation then is:

$$O_{ict} = \delta(K_i \times P_{ct}) + \gamma'X_{ict} + \beta K_i + \eta P_{ct} + \theta_t + \gamma_c + \varepsilon_{ict} \quad (2)$$

where all variables are as previously defined, but K_i is an indicator variable equal to 1 for those whose youngest child is kindergarten aged child, and zero for those whose youngest is an eight- or nine-year-old child.

Results are in Table 4, in the same layout as Table 3. In this case the estimates for men are consistently and quite precisely estimated zero effects. For single mothers, the results are very similar to the pattern we have already seen. The point estimates suggest that there is an increase in single mothers shifting to

¹³ We do not run a comparison against families with children younger than school age, because of concerns that knowledge of future school arrangements may change current labour supply. We do not include parents of children over the age of ten because child care may not be as big a concern for them. We do not include any families whose eight- or nine-year-old children were eligible for full-day kindergarten because of the possibility of dynamic long-run labour supply responses.

longer hours, and with the narrower definitions of French-school eligibility showing economically large and statistically significant increases in labour force participation, employment and hours worked, with an increase in the percentage working more than fifteen hours per week. The magnitude of these estimates is larger than those in Table 3. We again find some statistically significant labour supply response for women in two parent families with full-day kindergarten eligible children, but these are not consistent across different definitions of French-school-eligibility and are not consistent with those in Table 3.

5.3 Triple difference specification

We have so far examined two different estimation strategies: one using parents of non-French school eligible four- or five-year-olds as a control group, and the other using parents of French-school eligible eight- or nine-year-olds as a control group. This suggests the possibility of including non-French school eligible eight- or nine-year-olds and estimating a triple differences model: we can take the estimates from Table 4 and compare the estimated treatment effect to a similar regression including only non-French school eligible parents. This would allow for any labour market effects that differentially affect parents of four- to five-year-old children regardless of whether or not they are French-school-eligible to be accounted for.

Results for these regressions, for the set of parents in families where no adult reports knowing French, are in Table 5. They show in particular that there may be some general labour market changes differentially affecting men in two parent households with older children relative to younger children which may make a triple differences strategy more reliable.

Running a fully interacted triple differences model is complicated by the addition of timing and regional differences in the implementation of the policy, and the fact that to deal with regional labour market

variation we include a large number of regional (Census sub-division) fixed effects. For instance, our sample of single mothers with French as their mother tongue is only 840. With over 500 hundred CSDs, identification of a French by CSD interaction effects or CSD by year interaction effects would be working off very small numbers of observations.

We therefore estimate the following model:

$$O_{ict} = \delta^{DDD}(F_i \times K_i \times P_{ct}) + \delta^{DD1}(F_i \times P_{ct}) + \delta^{DD2}(K_i \times P_{ct}) + \gamma'X_{ict} + \beta K_i + \rho F_i + \eta P_{ct} + \nu(F_i \times K_i) + \eta(F_i \times Y_t) + \xi(K_i \times Y_t) + \theta_t + \gamma_c + \varepsilon_{ict} \quad (3)$$

$(F_i \times Y_t)$ and $(K_i \times Y_t)$ are French-school-eligible by year fixed effects and kindergarten-aged child by year fixed effects respectively. We also include interactions of F_i and K_i and each of these with the year fixed effects. We do not interact these variables separately with all the other control variables however, so in effect are restricting the estimated effects of, say, parent's age to be the same across French-school-eligible and ineligible parents, and parents whose youngest child is aged four or five rather than eight or nine.

The results are in Table 6. The only case in which there is a statistically significant point estimate for men is that weeks worked in the previous calendar year are estimated to rise by almost one week. The other point estimates are small and typically not statistically significant. The results are fairly consistent with those previously – with consistent and large estimated effects of the availability of full-day kindergarten on the labour supply and hours worked of single mothers, but only small and typically not statistically significant effects for other parents. For single mothers, for the narrowest definition of French-school eligibility, employment is eleven percentage points higher in the treated group with hours worked over five hours per week higher. Most of this reflects an increase in the proportion of single

mothers who work more than fifteen hours per week. For the broadest definition of French-school eligibility, as in the other models, the estimated effects are smaller in magnitude, but still quite large. For women in two parent households, the estimated effects are smaller than in the difference-in-differences estimates, and mostly statistically insignificant.

5.4 Relying only on timing differences: what if we include only French-school eligible parents of four- or five-year-olds?

The triple differences strategy uses movements in labour market outcomes for non-French speaking parents and parents of older children to control for general labour market changes that might also affect parents in households that would be eligible for French language full-day kindergarten. Another option that might be of interest if one were very concerned about specific labour market outcomes for French speaking parents of young children is to restrict the analysis to French-school eligible households with four- or five-year-old children only. In that case, all variation in treatment comes from the timing of when full-day kindergarten was introduced in a particular school board.

Restricting the sample only to French-school eligible families dramatically reduces the sample size. Consequently, we are only able to control for Census Division fixed effects in this model. The results (Table 7) show smaller estimated effects for mothers in two parent families than in our baseline specifications in Table 3, but larger estimates for single mothers. The pattern of labour response is consistent with that estimated in the baseline regression and the triple differences model, with estimates suggesting a large rise in the percentage of single mothers working more than fifteen hours per week. For men, the estimates are again typically small and not statistically significant. The same analysis but restricting the sample to parents in non-French school eligible households is in Table A3 for comparison.

5.5 Dealing with regional differences in where French speaking parents live

A possible complication of the analysis is that French-speaking communities are distributed geographically quite differently from the overall population. As a result, the labour market conditions faced by French-school eligible parents may be quite different from those faced by others. We control for fixed regional factors using CSD fixed effects in all regressions, however the weighting of the results in effect gives more weight to areas with a larger Anglophone population. Since the French language population is already relatively small, it is possible that our results could be driven by data on Anglophones in regions with relatively few treated households. Consequently, we estimate a weighted least squares regression of equation (1) with the weights for the Anglophone group reweighted to reflect the distribution of the French-school-eligible population.¹⁴ The results, in Appendix Table A4, are consistent with those in Table 3.

There may be some shift in employment prospects over time by region which could be correlated with the school boards' introduction of full-day kindergarten. We cannot include a full set of CSD×year fixed effects due to the very large number of CSDs and the relatively small sample sizes, but we can include broader region by year fixed effects. Finally, given that the group of CSDs that do not have access to French language education is quite remote, we also check the sensitivity of our results to dropping these 'never changers'. The estimated coefficients with either of these changes are again similar to those from the simpler models – Appendix Table A5 shows the estimates from the baseline

¹⁴ Specifically, the Census weight assigned to each individual was multiplied by the share of that CSD in Ontario's Francophone population and divided by the share of that CSD in Ontario's Anglophone population: $\frac{\sum_{i \in \text{franc}; \text{CSD}=d} w_{idt} / \sum_{i \in \text{franc}} w_{it}}{\sum_{i \in \text{angl}; \text{CSD}=d} w_{idt} / \sum_{i \in \text{angl}} w_{it}}$

specification compared with the estimates when each of these are added. Overall, we do not think there is unaccounted for regional variation, whether fixed or time varying, that is driving our results.

5.6 Pre-existing trends?

A key assumption in difference-in-differences models is that there are no pre-existing differences in trends in outcomes between the treatment and control groups. Unfortunately, the fact that we need to rely on Census data means that we cannot really estimate pre-policy rate trends. We only have two Census years that come before most French boards began switching to full-day kindergarten – 1991 and 1996. We can, however, show estimates for year effects for each of our treatment group (Francophone parents of four- or five-year-olds) and control groups, after controlling for demographic characteristics. These are in Figures 2a through 2c for each parent type and outcome measure. Each marker shows the estimated year effect for the group, while the bars show the 95 percent confidence intervals. Square markers denote French-school eligible parents and circles non-French-school-eligible parents. Solid markers are for parents of four- to five-year old children, and open markers are for parents of eight- to nine-year old children. Reading from left to right for each year, then, we have French-school-eligible parents of four- to five-year olds, non-French-school-eligible parents of four- to five-year olds, French-school-eligible parents of eight- to nine-year olds and non-French school eligible parents of eight- to nine-year olds. We include fixed effects for each group in the regression, so one of the years must act as the baseline for each – we use 1996. A concern over pre-existing trends might arise when there is a significant difference between the estimate of the 1991 fixed effect for the treatment group relative to the control groups.

As the figures show, however, this is rare. For single mothers, the labour force participation rate of French school eligible parents of four- or five-year-olds was lower than for other groups. For women in two parent families, the employment rate of French school eligible parents of four- or five-year-olds

was lower than for the other groups. But there are no other cases where there was a statistically significantly different pre-trend for the control group relative to the treatment group. Indeed, the estimated year fixed effects both before and after the policy changes are similar across all groups, with movements from year to year mostly in the same direction, suggesting that there have not been important differences in overall trends in the labour market that differentially affected the French-school eligible population.

5.7 Sensitivity to definition of a nearby school

Our measure of whether a parent lives close enough to a French school is based on whether they live in a CSD that is less than a 40 minute drive from a French language school. As an alternative, we can instead define this as living in a CSD in which there is a French school, which gives us fewer parents living in areas with access to French schools. The results in Table A2 are very similar to those in Table 3. Therefore, we do not believe our results are driven by our definition of being close to a nearby school.

5.8 Summary of Results

The triple differences results suggest that the switch to full-day kindergarten in Ontario's French schools may have had significant effects on labour supply of single mothers who have a strong French language background and are therefore most likely to send their children to French language schools. For single mothers whose mother tongue is French, the triple differences estimates suggest a roughly fifteen percent increase in the labour force participation rate, and an eleven percent increase in overall employment. These parents also appear to be working longer hours on average. There is not consistent and robust evidence for an economically important labour market effect for either mothers or fathers in two parent families.

The estimated effects for mothers in two parent households are typically not as large as those for single mothers. And for these mothers, the more strictly we define the treatment group in terms of French knowledge, the smaller the estimated effects are, and the less evidence there is of an increase in hours of work. The results are also not as robust to the implementation of the triple differences strategy.

For most specifications and outcome variables, fathers in two parent families with eligible children are estimated to have economically small and statistically insignificant responses to the introduction of full-day kindergarten, with small and statistically insignificant estimates in the triple differences strategy.

Our results are consistent with past findings that groups with initially lower labour force attachment and greater child care responsibilities may be more affected by changes to child care availability. It may be the case that there are larger effects on labour supply on certain sub-groups of the parents, such as those with lower education levels. Exploratory work suggests that there may be a somewhat larger increase in labour supply among less educated women, but we do not have large enough sample sizes to undertake reliable statistical inference on these sub-groups.

6. Conclusion

There has been much speculation that the extension of kindergarten programs from half-day to full-day can raise parental labour supply. In this paper, we used an ideal policy change to examine this question. We looked at a switch from half-day to full-day kindergarten that affected a relatively small subset of the population in most areas it was introduced. Also, families with young children are a small subset even of that group. As a result, there were unlikely any broader effects on the labour market outside the affected families, so that we are more clearly estimating the labour market effects for the affected parents only. There were no obvious capacity constraints affecting French language schools around the time they began introducing full-day kindergarten, and there was little additional change in ancillary

day care policies and practices associated with the extension of the school day. Although wraparound day care was provided directly by some schools by the late 2000s, it was not very common when the policies were initially rolled out. Finally, there were no other child care related or labour market policies implemented at the same time that would have differentially affected households with an adult who knew French compared with households that did not.

These are key advantages of our study – the results on labour supply are clearer than what we might see in studies of policy interventions that affect a larger proportion of the population and therefore may have broader equilibrium effects, or for which capacity constraints make a supposedly universal program less than universally available in practice. As well, the treated families are not completely geographically separated from the untreated families, so that unobserved local labour market effects are unlikely to drive our results.

We find evidence of an increase in labour supply of single mothers, with employment rates up to eleven percentage points higher, as well as a shift from working less than fifteen hours per week to working longer hours. Estimates for women in two parent families show some limited evidence of a modest labour supply response in terms of employment and hours worked per week, of the order of two to four percentage points, but these are less robust to the definition of the treatment and control groups, and the use of a triple differences strategy. Estimates for men typically show small point estimates, which are not robust to different specifications. The magnitudes of the estimated effects for single mothers are larger for those who are more likely to send their children to French language schools.

The estimates should be interpreted as the effects of the availability of full-day kindergarten in a nearby school relative to half-day kindergarten, with half-day programs remaining an option, rather than a compulsory switch to full-day kindergarten. To the extent that our broadest definition of French-school

eligibility might include a number of parents who do not wish to send their children to a French language school, or that some parents might not consider sending their children to kindergarten at all, our treatment group may include some parents who are not treated in the sense that they do not in fact send their children to French-language kindergartens. We cannot observe whether parents did in fact register their students in a French-language kindergarten program. The results then might understate the effects of a policy that involved a compulsory switch from half-day to full-day kindergarten programs. Since kindergarten programs in general are optional, however, intent-to-treat are quite policy relevant.

As noted by Fitzpatrick (2010) and Cascio (2009), similar labour supply responses to those estimated in this paper need not necessarily be observed in another time or place with different labour market conditions. We found that single mothers were most affected by the switch to full-day kindergarten in the French language school system, but single mothers had initially low employment rates compared with either mothers in two parent families or with fathers. Indeed, the employment rate of non-Francophone single mothers has increased so dramatically since 1996 that it would be unlikely that the current roll-out of full-day kindergarten in the English language schools beginning in 2010 (a decade after the change we examine) could have a large effect even on single mothers' employment, although perhaps the combination of full-day kindergarten and other policies such as providing wrap-around care within the schools may lead to some increase in hours worked in this group.

Our estimates are for the effect on labour supply of a full-day kindergarten program while the child is in kindergarten. It is possible that an initial boost in labour market activity while a child is young is followed by permanently stronger labour market attachment once the child is older, and higher lifetime income. This is suggested by findings that exogenous changes in employment probabilities have been shown to have longer run effects in other contexts (for instance, Oreopoulos, von Wachter and Heisz,

2012), and the concerns that spending time out of work looking after young children has long run effects on career trajectories (Miller, 2011). Research by Lefebvre, Merrigan and Verstraete (2009) shows long run effects of subsidized child care in Quebec on labour supply of affected mothers, though this was related to an increase in the percentage of children enrolled in child care, rather than an extension of the length of the school day for a kindergarten program, so may well have different effects. Our finding of limited short-run effects for most parents, however, suggests that there are unlikely to be large long-run effects.

Finally, some proponents of using public funds to increase the length of the kindergarten day have argued that it could at least partially pay for itself through increased tax revenues resulting from increased parental employment and incomes. Since female single parents are a relatively small proportion of the overall population (roughly seven percent of the French-school eligible parents in our data, and ten percent of non-French parents), and tend to have lower incomes and therefore lower marginal tax rates than other parents, the results here suggest that this is unlikely. Given that single mothers are a large proportion of welfare recipients, there could be a reduction in spending on welfare payments. However, using the largest point estimate, the results here suggest that employment rates of female single parents would rise eleven percentage points – which would translate into a gain in employment for all parents of under one percentage point. Without significant long-run labour supply effects, it seems unlikely that an employment change of that magnitude could generate revenue or cost savings enough to offset the cost of introducing full-day kindergarten for all children

7. References

- Baker, Michael, Jonathan Gruber, and Kevin Milligan. 2008. "Universal Child Care, Maternal Labor Supply, and Family Well-Being." *Journal of Political Economy* 116(4): 709-745
- Bertrand, Marianne, Esther Duflo and Sendhil Mullainathan. 2004. "How Much Should We Trust Difference-in-Differences Estimates?" *Quarterly Journal of Economics* 119(1): 249-275
- Blau, David, and Erdal Tekin. 2007. "The determinants and consequences of child care subsidies for single mothers." *Journal of Population Economics* 20:719-41.
- Cascio, Elizabeth. 2009. "Maternal labor supply and the introduction of kindergartens into American public schools." *Journal of Human Resources* 44(1): 140-170
- Cascio, Elizabeth and Diane Whitmore Schanzenbach. 2013. "The impacts of expanding access to high-quality preschool education." *Brookings Papers on Economic Activity* Fall: 127-192.
- Cannon, Jill S., Alison Jacknowitz and Gary Painter. 2006. "Is full better than half? Examining the longitudinal effects of full-day kindergarten attendance." *Journal of Policy Analysis and Management* 25(2): 229-321
- DeCicca, P. 2007. Does full-day kindergarten matter? Evidence from the first two years of schooling. *Economics of Education Review*, 26(1), 67-82.
- Dhuey, Elizabeth, Jessie Lamontagne, and Tingting Zhang. 2019. "The impact of full-day kindergarten on maternal labour supply" IZA Discussion Paper No. 12507.
- Fitzpatrick, Maria. 2010. "Preschoolers Enrolled and Mothers at Work? The Effects of Universal Prekindergarten." *Journal of Labor Economics* 28(1): 51-85
- Fitzpatrick, Maria. 2012. "Revising our thinking about the relationship between maternal labor supply and preschool." *Journal of Human Resources* 47(3): 583-612
- Gelbach, Jonah. 2002. "Public schooling for young children and maternal labor supply." *American Economic Review* 92(1): 307-22
- Gibbs, Chloe. 2014a. "Experimental evidence on early intervention: the impact of full-day kindergarten." EdPolicyWorks Working Paper Series No. 34.
- Gibbs, Chloe. 2014b. A matter of time? Impact of statewide full-day kindergarten expansions on later academic skills and maternal employment. *The Department of Labour 2013-2014 Scholars Program Working Paper Series*, 3-36.
- Goodman-Bacon, Andrew. 2018. "Difference-in-Differences with Variation in Treatment Timing." NBER Working Paper No.25018
- Haeck, Catherine, Pierre Lefebvre and Philip Merrigan. 2015. "Canadian evidence on ten years of universal preschool policies: The good and the bad." *Labour Economics* 36: 137-157

- Herbst, Chris. 2017. "Universal child care, maternal employment, and children's long-run outcomes: evidence from the U.S. Lanham Act of 1940." *Journal of Labor Economics*. 35(2): 519-564
- Herry, Y., C. Maltais, and K. Thompson. 2007. "Effects of a Full-Day Preschool Program on 4-Year-Old Children." *Early Childhood Research and Practice* 9(2)
- Hardoy, Ines and Pal.Schone. 2015. "Enticing even higher female labor supply: the impact of cheaper day care." *Review of the Economics of the Household* 13: 815-836
- Lee, Valarie, David Burkam, Douglas D. Ready, Joann Honigman, and Samuel Meisels. 2006. "Full-day versus half-day kindergarten: In which program do children learn more?" *American Journal of Education* 112(2):163-208.
- Lefebvre, Pierre and Philip Merrigan. 2008. "Child-Care Policy and the Labor Supply of Mothers with Young Children: A Natural Experiment from Canada." *Journal of Labor Economics* 26(3): 519-548
- Lefebvre, Pierre, Philip Merrigan and Mathieu Verstraete. 2009. "Dynamic Labour Supply Effects of Childcare Subsidies: Evidence from a Canadian Natural Experiment on Low-Fee Universal Child Care." *Labour Economics* 16(5): 490-502
- McCain, M., F. Mustard and S. Shanker. 2007. *Early Years Study 2*. Toronto, ON: Council for Early Child Development
- Miller, Amalia. 2011. "The Effect of Motherhood Timing on Career Path." *Journal of Population Economics* 24(3): 1071-1100
- Oreopoulos, Philip, Till von Wachter, and Andrew Heisz. 2012. "The Short- and Long-Term Career Effects of Graduating in a Recession." *American Economic Journal: Applied Economics* 4(1): 1-29
- Votruba-Drzal. E., CP. Lin-Grining, and C. Maldonada-Carreno. 2008. "A developmental perspective on full-versus part-day kindergarten and children's academic trajectories through fifth grade." *Child Development*. 79(4): 957-78
- Warburton, William P., Rebecca N. Warburton and Clyde Hertzman 2012. "Does Full Day Kindergarten Help Kids?" *Canadian Public Policy* 38(4): 591-603

Figure 1. Maps of School Board areas for French Catholic and French Public School Boards



Source: <http://www.afocsc.org/territoires/index.html> (French Catholic) and <http://www.ofa.gov.on.ca/en/franco-schoolboards.html#catholic> (French public).

Figure 2a. Estimated year effects by outcome variable and type of household, for women in single parent households

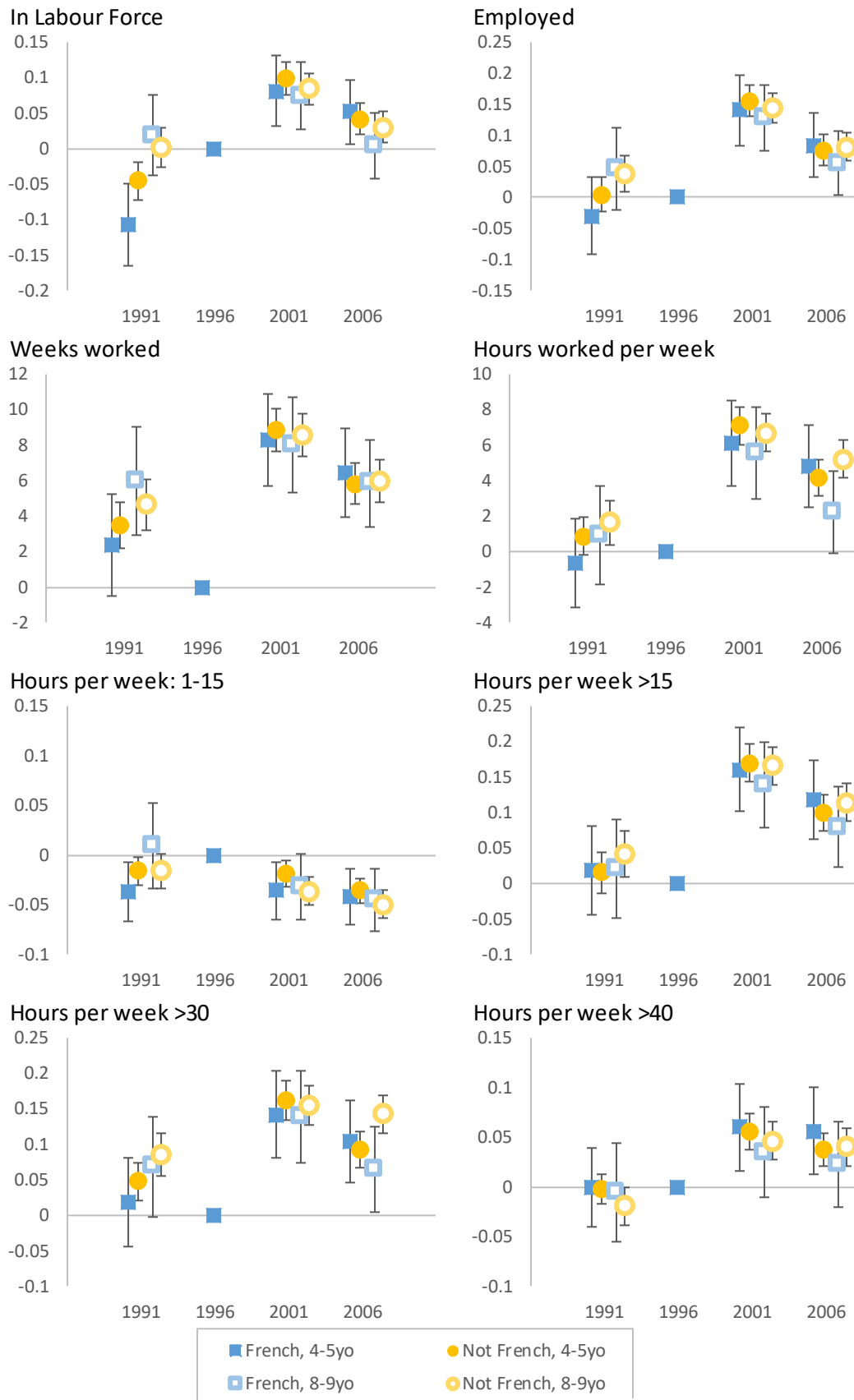


Figure 2b. Estimated year effects by outcome variable and type of household, for women in two parent households

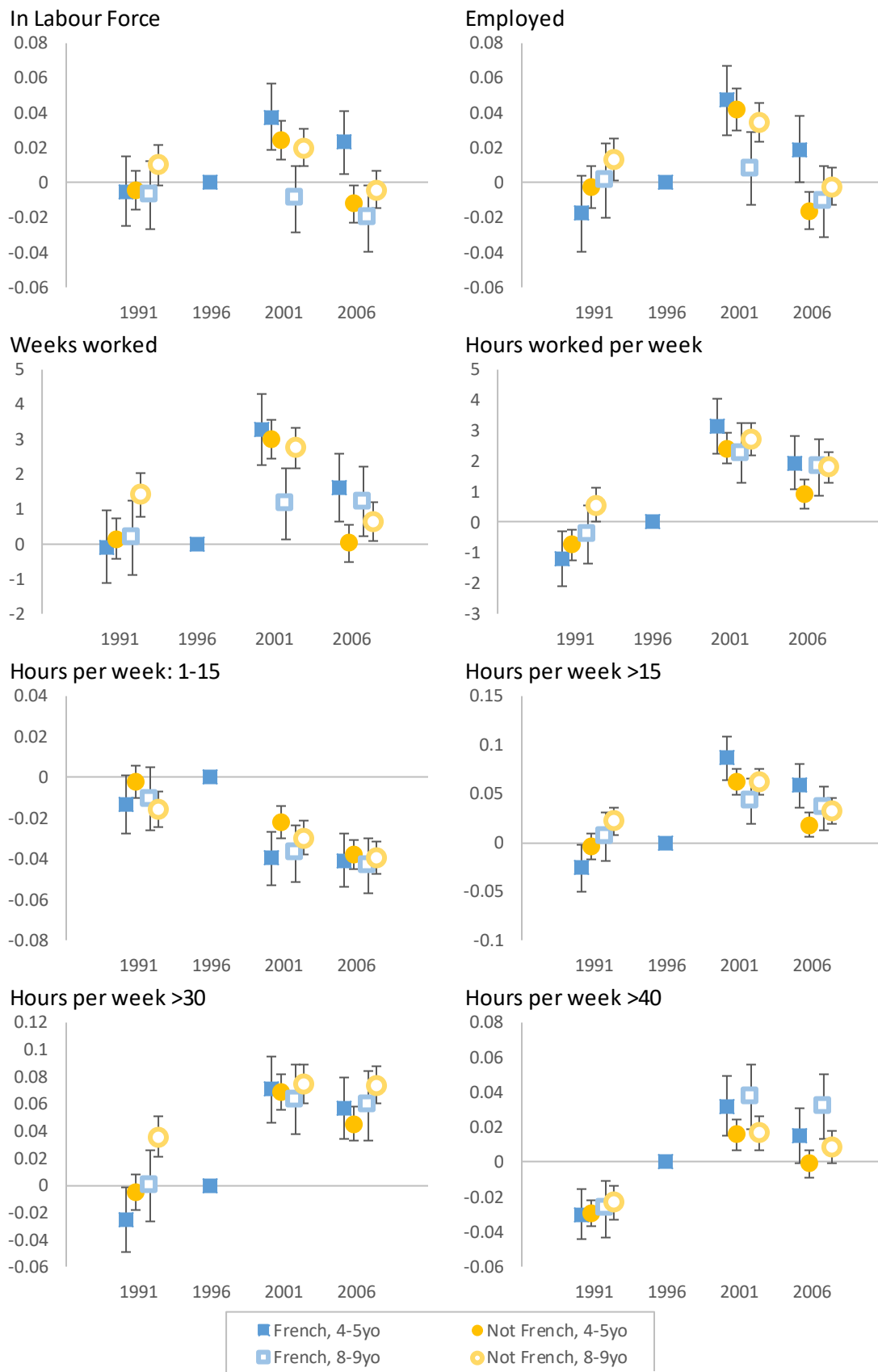


Figure 2c. Estimated year effects by outcome variable and type of household, for men in two parent households

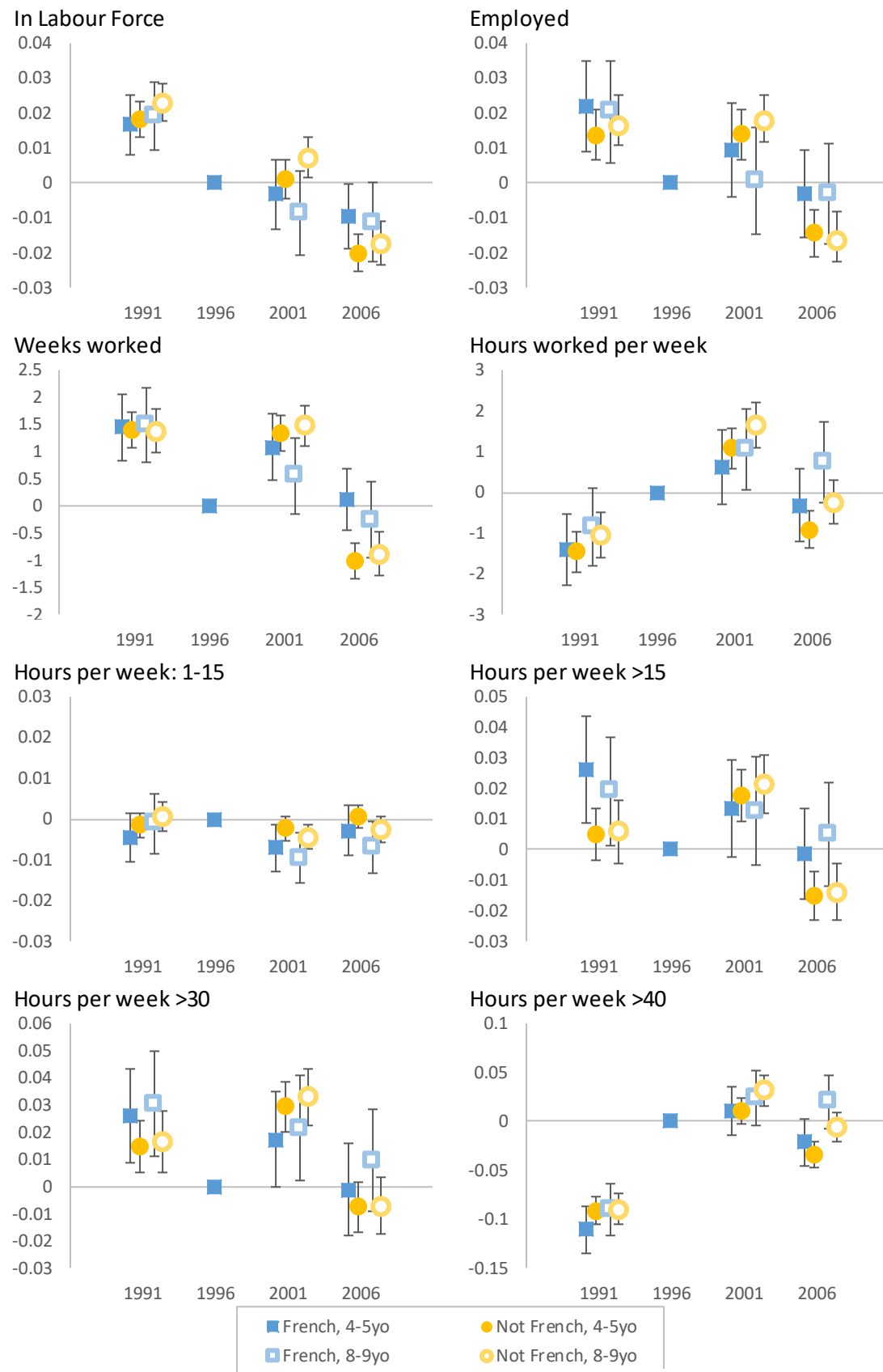


Table 1. Ontario's French-language school boards, full-day kindergarten starting years, and share of 25- to 45-year-old parents residing in each district, by language

Board name	Year began full-day:		First Census year FDK available for:		Share of Ontario's 25-45 year olds living in each school district	
	JK	SK	JK	SK	French-school eligible	Non-French- school eligible
Catholic						
CSCD des Grande Rivières	2001-02	1994-95	2006	1996	0.043	0.005
CSD des Aurores Boreales	2003-04	1992-93	2006	1996	0.012	0.019
CSC Franco-Nord	2000-01	1999-2000	2001	2001	0.021	0.005
CSDC Centre-Sud		1998-99	2001	2001	0.449	0.649
CDC du Nouvel-Ontario		1999-2000	2001	2001	0.064	0.022
CSDEC de Sud-Ouest		1999-2000	2001	2001	0.069	0.133
CSDC de Centre-Est de l'Ontario		2000-01	2001	2001	0.248	0.092
CSDC de l'Est Ontarien		2001-02	2006	2006	0.068	0.007
None					0.026	0.067
Public						
CSD du Centre Sud-Ouest / Viamonde		1998-99	2001	2001	0.490	0.712
CSP du Grand Nord de l'Ontario		1999-2000	2001	2001	0.056	0.020
CSP du Nord-Est de l'Ontario		2000-01	2006	2006	0.056	0.009
CEP de l'Est de l'Ontario		2002-03	2006	2006	0.290	0.070
None					0.109	0.188

Source: Various publications and communications with school boards; Census Master Files
 French-school eligible population here includes any 25- to 45-year-old living in a family with the youngest child aged four or five years old, with at least one adult reporting a *knowledge* of French. Non-French school eligible population has no adults reporting a knowledge of French. Only considered to be living in the district if the closest French school is in that district and is less than a 40-minute drive from the CSD in which the parent is living.

Table 2. Summary statistics (by parent type and knowledge of French)

	Female single parent				Female, 2 parent family				Male, 2 parent family			
	Adult in family knows French	Family reports French as a home language	Adult in family reports mother tongue French	No French	Adult in family knows French	Family reports French as a home language	Adult in family reports mother tongue French	No French	Adult in family knows French	Family reports French as a home language	Adult in family reports mother tongue French	No French
Number of observations (rounded)	1875	820	840	13410	13820	4755	6255	59485	12740	4470	5935	54985
Categorical variables: % of total												
% in the labour force	0.7746	0.7757	0.7075	0.7299	0.7996	0.8089	0.7889	0.7616	0.9639	0.9557	0.9571	0.9592
% employed	0.6872	0.6814	0.6141	0.6456	0.7541	0.7584	0.7307	0.7153	0.9273	0.9165	0.9099	0.9236
% working <=15 hrs/week	0.0487	0.0331	0.0425	0.0520	0.0858	0.0662	0.0740	0.0865	0.0136	0.0165	0.0131	0.0114
% working > 15 hrs/week	0.6101	0.6260	0.5477	0.5516	0.6460	0.6673	0.6318	0.6085	0.8928	0.8766	0.8715	0.8914
% working > 30 hrs/week	0.4990	0.5059	0.4380	0.4325	0.4806	0.5224	0.4788	0.4396	0.8624	0.8495	0.8452	0.8641
% working >40 hrs/week	0.1342	0.1260	0.1016	0.1041	0.1320	0.1160	0.1077	0.1082	0.4417	0.4152	0.3946	0.4530
% with older child	0.5205	0.5490	0.5386	0.5712	0.7845	0.7918	0.7825	0.7871	0.7764	0.7858	0.7782	0.7830
% of sample with education level:												
< High School	0.2610	0.2569	0.3315	0.3470	0.1766	0.1847	0.2367	0.2206	0.1958	0.2179	0.2628	0.2339
High School	0.1719	0.1921	0.1945	0.1986	0.1659	0.2037	0.2143	0.2241	0.1437	0.1800	0.1800	0.1918
Trades/college	0.3721	0.4318	0.3806	0.3678	0.3282	0.3604	0.3668	0.3623	0.3543	0.3757	0.3846	0.3770
University degree	0.1950	0.1191	0.0934	0.0866	0.3294	0.2511	0.1823	0.1930	0.3062	0.2264	0.1727	0.1972
Means of (non-categorical) variables:												
Weeks worked	32.13	31.46	27.26	29.72	35.68	35.81	34.45	34.34	46.87	46.02	45.80	46.69
Hours worked	24.04	24.25	20.98	21.22	24.87	25.59	24.02	23.13	41.34	40.41	39.96	41.59
Age	32.95	32.87	32.46	33.10	35.80	35.17	34.74	35.45	37.04	36.66	36.34	36.92
Standard deviations of (non-categorical) variables												
Weeks worked	22.15	22.49	22.90	22.81	21.22	21.18	21.69	21.87	12.07	12.97	13.30	12.31
Hours worked	19.89	19.67	19.58	19.65	18.99	18.79	18.83	18.98	17.92	18.46	18.77	18.11
Age	5.01	4.95	4.77	5.10	4.64	4.63	4.56	4.49	4.50	4.50	4.51	4.43

Sample includes all 25- to 45-year-old parents of children who turn four or five in the year prior to the Census (for Census years 1991, 1996, 2001 and 2006), by reported French language status of the adults in the family. All observation counts have been rounded to the nearest five to satisfy release conditions for use of the Census Master Files.

Table 3. Estimates of the effect of full-day kindergarten availability by type of parent and definition of French eligibility: sample includes all parents of four- or five-year-olds

Dep. Var:	In labour force	Employed	Weeks worked	Hours per week:				
				Hours	1-15 hrs	>15 hrs	>30 hrs	>40 hrs
French eligibility based on knowledge of French								
Women in one parent household (sample size: 15,290)								
FDK ($F_i \times P_{dt}$)	0.0272 (0.0223)	0.0171 (0.0245)	1.7577 (1.1380)	1.3563 (1.0264)	-0.0198 (0.0122)	0.0390 (0.0256)	0.0324 (0.0259)	0.0031 (0.0187)
R ²	0.1283	0.1432	0.1565	0.1474	0.0432	0.1359	0.1299	0.0603
Women in two parent household (sample size: 73,305)								
FDK ($F_i \times P_{dt}$)	0.0245 (0.0084)**	0.0237 (0.0090)**	1.6434 (0.4414)**	0.9999 (0.3921)*	-0.0039 (0.0059)	0.0309 (0.0099)**	0.0173 (0.0104)	0.0141 (0.0070)*
R ²	0.0406	0.0457	0.0509	0.0432	0.0173	0.0398	0.0378	0.0231
Men in two parent household (sample size: 67,730)								
FDK ($F_i \times P_{dt}$)	0.0051 (0.0041)	0.0012 (0.0056)	0.7340 (0.2582)**	0.2025 (0.3872)	-0.0023 (0.0025)	0.0017 (0.0067)	-0.0053 (0.0075)	0.0215 (0.0107)*
R ²	0.0228	0.0369	0.0547	0.0473	0.0110	0.0353	0.0357	0.0412
French eligibility based on home language French								
Women in one parent household (sample size: 15,290)								
FDK ($F_i \times P_{dt}$)	0.0845 (0.0347)*	0.0828 (0.0377)*	3.7442 (1.828)*	3.6228 (1.518)*	0.0076 (0.0148)	0.0812 (0.0387)*	0.0946 (0.0384)*	0.0054 (0.0254)
R ²	0.1284	0.1432	0.1562	0.1473	0.0431	0.1361	0.1300	0.0599
Women in two parent household (sample size: 73,305)								
FDK ($F_i \times P_{dt}$)	0.0284 (0.0137)*	0.0249 (0.0148)	2.0096 (0.721)*	-0.0911 (0.6290)	0.0300 (0.0085)**	-0.0114 (0.0161)	-0.0045 (0.0169)	-0.0015 (0.0107)
R ²	0.0403	0.0454	0.0507	0.0431	0.0176	0.0397	0.0383	0.0224
Men in two parent household (sample size: 67,730)								
FDK ($F_i \times P_{dt}$)	0.0066 (0.0077)	-0.0054 (0.0099)	0.6736 (0.4642)	0.4132 (0.6456)	-0.0021 (0.0047)	-0.0011 (0.0119)	-0.0063 (0.0129)	0.0369 (0.0171)*
R ²	0.0226	0.0368	0.0545	0.0473	0.0110	0.0353	0.0357	0.0412
French eligibility based on mother tongue French								
Women in one parent household (sample size: 15,290)								
FDK ($F_i \times P_{dt}$)	0.1343 (0.0321)**	0.0983 (0.0354)**	3.2359 (1.6881)	4.7161 (1.404)**	0.0017 (0.0167)	0.1205 (0.0362)**	0.1121 (0.0358)**	0.0245 (0.0251)
R ²	0.1289	0.1432	0.1562	0.1470	0.0430	0.1360	0.1295	0.0598
Women in two parent household (sample size: 73,305)								
FDK ($F_i \times P_{dt}$)	0.0359 (0.0120)**	0.0459 (0.0129)**	1.9598 (0.6301)**	1.3874 (0.5460)*	0.0199 (0.0078)*	0.0276 (0.0140)*	0.0360 (0.0146)*	0.0089 (0.0093)
R ²	0.0401	0.0453	0.0506	0.0428	0.0175	0.0394	0.0379	0.0224
Men in two parent household (sample size: 67,730)								
FDK ($F_i \times P_{dt}$)	0.0197 (0.0063)**	0.0207 (0.0086)*	1.6344 (0.3923)**	0.8650 (0.5606)	-0.0067 (0.0033)*	0.0242 (0.0101)*	0.0176 (0.0110)	0.0242 (0.0148)
R ²	0.0228	0.0369	0.0548	0.0474	0.0110	0.0355	0.0358	0.0413

Note: Estimates are from equation (1). Robust standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Model includes controls for French household, living in a region and year where the French school board offer full-day kindergarten, parental education dummies, a quadratic in parental age, a dummy variable for presence of older children, and Census Sub-Division and year fixed effects. Each column shows regression results for a different outcome variable for the parent type indicated in the row. All observation counts have been rounded to the nearest 5 to satisfy release conditions for use of the Census Master Files.

Table 4. Estimates of the effect of full-day kindergarten availability by type of parent and definition of French eligibility: sample includes French-school eligible parents of four- to five-year-olds and eight- to nine-year-olds

Dep. Var:	In labour force	Employed	Weeks worked	Hours per week:				
				Hours	1-15 hrs	>15 hrs	>30 hrs	>40 hrs
French eligibility based on knowledge of French								
Women in one parent household (sample size: 3595)								
FDK ($K_i \times P_{dt}$)	0.1029 (0.0282)**	0.0833 (0.0316)*	4.3853 (1.4760)**	3.7570 (1.3367)**	0.0081 (0.0161)	0.0801 (0.0333)*	0.0865 (0.0339)*	0.0174 (0.0239)
R ²	0.1706	0.1840	0.2162	0.2039	0.1292	0.1854	0.1805	0.1315
Women in two parent household (sample size: 24,915)								
FDK ($K_i \times P_{dt}$)	0.0175 (0.0100)	0.0072 (0.0107)	1.1512 (0.5307)*	-0.0178 (0.4838)	-0.0051 (0.0070)	0.0130 (0.0120)	-0.0007 (0.0129)	-0.0086 (0.0089)
R ²	0.0589	0.0664	0.0730	0.0691	0.0287	0.0631	0.0576	0.0464
Men in two parent household (sample size: 22,095)								
FDK ($K_i \times P_{dt}$)	-0.0020 (0.0053)	-0.0066 (0.0072)	0.2906 (0.3301)	-1.0180 (0.4949)*	0.0031 (0.0031)	-0.0080 (0.0085)	-0.0132 (0.0094)	-0.0298 (0.0135)*
R ²	0.0379	0.0581	0.0726	0.0621	0.0218	0.0536	0.0519	0.0644
French eligibility based on home language French								
Women in one parent household (sample size: 1630)								
FDK ($K_i \times P_{dt}$)	0.1450 (0.0457)**	0.1296 (0.0496)*	7.4415 (2.3527)**	6.7710 (2.0793)**	-0.0083 (0.0194)	0.1593 (0.0508)**	0.1713 (0.0512)**	0.0229 (0.0358)
R ²	0.2397	0.2532	0.2597	0.2498	0.1806	0.2456	0.2464	0.1657
Women in two parent household (sample size: 8725)								
FDK ($K_i \times P_{dt}$)	-0.0059 (0.0172)	-0.0166 (0.0187)	0.5766 (0.9194)	-2.0837 (0.8082)*	0.0240 (0.0107)*	-0.0449 (0.0204)*	-0.0433 (0.0219)*	-0.0377 (0.0139)*
R ²	0.0971	0.1061	0.1151	0.1048	0.0578	0.1012	0.0913	0.0768
Men in two parent household (sample size: 7940)								
FDK ($K_i \times P_{dt}$)	-0.0158 (0.0099)	-0.0329 (0.0132)*	-0.3867 (0.5965)	-2.0849 (0.8501)*	0.0014 (0.0058)	-0.0278 (0.0156)	-0.0270 (0.0169)	-0.0381 (0.0224)
R ²	0.0672	0.0946	0.0983	0.0973	0.0412	0.0870	0.0827	0.0840
French eligibility based on mother tongue French								
Women in one parent household (sample size: 1660)								
FDK ($K_i \times P_{dt}$)	0.1955 (0.0433)**	0.1453 (0.0476)**	6.6603 (2.2875)**	7.2127 (1.920)**	0.0118 (0.0219)	0.1660 (0.0490)**	0.1743 (0.0490)**	0.0359 (0.0312)
R ²	0.2445	0.2594	0.2580	0.2725	0.1833	0.2700	0.2637	0.1801
Women in two parent household (sample size: 11,765)								
FDK ($K_i \times P_{dt}$)	0.0072 (0.0150)	-0.0004 (0.0161)	0.6045 (0.7867)	-0.6077 (0.6931)	0.0186 (0.0100)	-0.0191 (0.0176)	-0.0084 (0.0185)	-0.0090 (0.0120)
R ²	0.0892	0.0973	0.1130	0.1008	0.0511	0.0973	0.0927	0.0668
Men in two parent household (sample size: 10,805)								
FDK ($K_i \times P_{dt}$)	0.0067 (0.0082)	0.0007 (0.0111)	0.6167 (0.5035)	-1.1694 (0.7372)	0.0015 (0.0044)	-0.0005 (0.0130)	-0.0043 (0.0141)	-0.0424 (0.0192)*
R ²	0.0586	0.0843	0.1005	0.0870	0.0339	0.0800	0.0783	0.0808

Note: Estimates are from equation (2). Robust standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Model includes controls for age of youngest own child, living in a region and year where the French school board offer full-day kindergarten, parental education dummies, a quadratic in parental age, a dummy variable for presence of older children, and Census Sub-Division and year fixed effects. Each column shows regression results for a different outcome variable for the parent type indicated in the row. All observation counts have been rounded to the nearest 5 to satisfy release conditions for use of the Census Master Files.

Table 5. Estimates of the effect of full-day kindergarten availability by type of parent and definition of French eligibility: sample includes non-French school eligible parents of four- to five-year-olds and eight- to nine-year-olds (equation 2)

Dep. Var:	In labour force	Employed	Weeks worked	Hours per week:				
				Hours	1-15 hrs	>15 hrs	>30 hrs	>40 hrs
French eligibility based on knowledge of French								
Women in one parent household (sample size: 25,685)								
FDK ($K_i \times P_{dt}$)	0.0290 (0.0112)*	0.0166 (0.0123)	0.0717 (0.5767)	-0.0292 (0.5122)	0.0182 (0.0063)*	-0.0012 (0.0129)	-0.0059 (0.0130)	-0.0005 (0.0085)
R ²	0.1111	0.1281	0.1413	0.1304	0.0307	0.1202	0.1132	0.0474
Women in two parent household (sample size: 107,240)								
FDK ($K_i \times P_{dt}$)	-0.0034 (0.0051)	-0.0031 (0.0054)	-0.0733 (0.2630)	-0.2839 (0.2355)	0.0005 (0.0035)	-0.0045 (0.0060)	-0.0079 (0.0063)	-0.0026 (0.0040)
R ²	0.0395	0.0442	0.0501	0.0424	0.0149	0.0401	0.0350	0.0173
Men in two parent household (sample size: 95,910)								
FDK ($K_i \times P_{dt}$)	-0.0036 (0.0026)	-0.0048 (0.0035)	-0.5396 (0.1634)**	-0.8624 (0.2414)**	0.0041 (0.0014)**	-0.0088 (0.0041)*	-0.0085 (0.0045)	-0.0304 (0.0066)**
R ²	0.0227	0.0332	0.0515	0.0443	0.0099	0.0329	0.0334	0.0378

Note: Estimates are from equation (2), so that parents in families where no adult knows French are treated as ‘treated’. Robust standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Model includes controls for age of youngest own child, living in a region and year where the French school board offer full-day kindergarten, parental education dummies, a quadratic in parental age, a dummy variable for presence of older children, and Census Sub-Division and year fixed effects. Each column shows regression results for a different outcome variable for the parent type indicated in the row. All observation counts have been rounded to the nearest 5 to satisfy release conditions for use of the Census Master Files.

Table 6. Triple differences estimates of the effect of full-day kindergarten availability by type of parent and definition of French eligibility (equation 3)

Dep. Var:	In labour force	Employed	Weeks worked	Hours per week:				
				Hours	1-15 hrs	>15 hrs	>30 hrs	>40 hrs
French eligibility based on knowledge of French								
Women in one parent household (sample size: 29,280)								
FDK ($F_i \times K_i \times P_{dt}$)	0.0612 (0.0299)*	0.0481 (0.0336)	3.4068 (1.5751)*	2.9375 (1.4496)*	-0.0130 (0.0189)	0.0664 (0.0359)	0.0796 (0.0369)*	0.0059 (0.0265)
R ²	0.1106	0.1276	0.1437	0.1321	0.0311	0.1205	0.1147	0.0496
Women in two parent household (sample size: 132150)								
FDK ($F_i \times K_i \times P_{dt}$)	0.0287 (0.0115)*	0.0216 (0.0124)	1.3233 (0.6088)*	0.5221 (0.5568)	-0.0021 (0.0080)	0.0253 (0.0139)	0.0083 (0.0148)	-0.0052 (0.0102)
R ²	0.0392	0.0445	0.0502	0.0437	0.0137	0.0406	0.0359	0.0199
Men in two parent household (sample size: 118,005)								
FDK ($F_i \times K_i \times P_{dt}$)	-0.0008 (0.0063)	-0.0023 (0.0083)	0.7076 (0.3850)	-0.3104 (0.5694)	0.0015 (0.0035)	-0.0031 (0.0098)	-0.0093 (0.0108)	0.0038 (0.0156)
R ²	0.0205	0.0329	0.0510	0.0425	0.0079	0.0320	0.0323	0.0383
French eligibility based on home language French								
Women in one parent household (sample size: 29,280)								
FDK ($F_i \times K_i \times P_{dt}$)	0.0746 (0.0453)	0.0639 (0.0502)	4.6031 (2.3924)	4.4027 (2.0549)*	-0.0319 (0.0251)	0.1134 (0.0521)*	0.1371 (0.0526)**	-0.0121 (0.0362)
R ²	0.1102	0.1271	0.1429	0.1318	0.0313	0.1204	0.1147	0.0494
Women in two parent household (sample size: 132150)								
FDK ($F_i \times K_i \times P_{dt}$)	0.0001 (0.0183)	-0.0123 (0.0200)	0.6959 (0.9646)	-1.5402 (0.8653)	0.0240 (0.0112)*	-0.0392 (0.0218)	-0.0246 (0.0234)	-0.0319 (0.0149)*
R ²	0.0390	0.0444	0.0501	0.0436	0.0139	0.0407	0.0364	0.0192
Men in two parent household (sample size: 118,005)								
FDK	-0.0180	-0.0354	-0.4568	-1.6525	0.0009	-0.0323	-0.0340	-0.0085
FDK ($F_i \times K_i \times P_{dt}$)	(0.0111)	(0.0144)*	(0.6450)	(0.9079)	(0.0060)	(0.0165)	(0.0180)	(0.0241)
R ²	0.0203	0.0329	0.0507	0.0424	0.0079	0.0320	0.0322	0.0382
French eligibility based on mother tongue French								
Women in one parent household (sample size: 29,280)								
FDK ($F_i \times K_i \times P_{dt}$)	0.1596 (0.0433)**	0.1142 (0.0482)*	5.0302 (2.3027)*	5.6985 (1.9407)**	0.0106 (0.0247)	0.1349 (0.0496)**	0.1436 (0.0502)**	0.0257 (0.0329)
R ²	0.1105	0.1270	0.1429	0.1315	0.0310	0.1203	0.1143	0.0498
Women in two parent household (sample size: 132150)								
FDK ($F_i \times K_i \times P_{dt}$)	0.0186 (0.0162)	0.0147 (0.0174)	0.7450 (0.8492)	0.1867 (0.7570)	0.0202 (0.0108)	-0.0056 (0.0192)	0.0113 (0.0203)	-0.0033 (0.0130)
R ²	0.0390	0.0444	0.0502	0.0435	0.0138	0.0406	0.0360	0.0192
Men in two parent household (sample size: 118,005)								
FDK ($F_i \times K_i \times P_{dt}$)	0.0017 (0.0091)	-0.0013 (0.0121)	0.6866 (0.5485)	-0.6332 (0.7882)	-0.0008 (0.0045)	-0.0018 (0.0139)	-0.0080 (0.0152)	-0.0149 (0.0209)
R ²	0.0206	0.0330	0.0512	0.0425	0.0079	0.0321	0.0323	0.0383

Note: Estimates are from equation (3), so that the treatment variable is the interaction of having at least one adult in the family with French, the youngest child being four or five years old, and living in a district and a time when full-day kindergarten is available. Robust standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Model includes controls for French household, age of youngest own child, living in a region and year where the French school board offer full-day kindergarten, parental education dummies, a quadratic in parental age, a dummy variable for presence of older children, and Census Sub-Division and year fixed effects. Interactions between French household and age of youngest own child with each other, with year and with full-day kindergarten availability are included. Each column shows regression results for a different outcome variable for the parent type indicated in the row. All observation counts have been rounded to the nearest 5 to satisfy release conditions for use of the Census Master Files.

Table 7. Estimates of the effect of full-day kindergarten availability by type of parent and definition of French eligibility: sample includes only parents of French-school-eligible four- to five-year- olds

Dep. Var:	In the labour	Employed	Weeks worked	Hours per week:				
				Hours	1-15 hrs	>15 hrs	>30 hrs	>40 hrs
French eligibility based on knowledge of French								
Women in one parent household (sample size: 1875)								
FDK (P _{dt})	0.0491 (0.0537)	0.0487 (0.0599)	5.5255 (2.8183)*	2.4557 (2.4260)	-0.0262 (0.0218)	0.0758 (0.0636)	0.0963 (0.0634)	-0.0685 (0.0422)
R ²	0.1625	0.1663	0.2047	0.1916	0.0696	0.1715	0.1683	0.0816
Women in two parent household (sample size: 13,820)								
FDK (P _{dt})	-0.0007 (0.0192)	-0.0301 (0.0207)	1.2884 (1.0302)	-1.4314 (0.9373)	-0.0125 (0.0132)	-0.0200 (0.0226)	-0.0236 (0.0241)	-0.0030 (0.0160)
R ²	0.0415	0.0483	0.0593	0.0498	0.0155	0.0457	0.0418	0.0259
Men in two parent household (sample size: 12,740)								
FDK (P _{dt})	-0.0077 (0.0099)	-0.0186 (0.0126)	0.1832 (0.6251)	-2.0946 (1.0081)*	-0.0020 (0.0045)	-0.0108 (0.0156)	-0.0263 (0.0168)	-0.0609 (0.0247)*
R ²	0.0142	0.0292	0.0500	0.0374	0.0127	0.0309	0.0304	0.0422
French eligibility based on home language French								
Women in one parent household (sample size: 820)								
FDK (P _{dt})	0.0963 (0.0708)	0.1612 (0.0791)*	7.6242 (3.6902)*	7.7250 (3.0601)*	-0.0208 (0.0290)	0.1930 (0.0849)*	0.2442 (0.0832)*	-0.0301 (0.0555)
R ²	0.1902	0.1947	0.2186	0.1985	0.0920	0.1902	0.2044	0.0934
Women in two parent household (sample size: 4755)								
FDK (P _{dt})	0.0311 (0.0276)	0.0078 (0.0310)	4.1167 (1.5338)**	-0.5376 (1.3279)	0.0298 (0.0180)	-0.0249 (0.0333)	-0.0149 (0.0354)	0.0044 (0.0224)
R ²	0.0621	0.0693	0.0853	0.0707	0.0270	0.0662	0.0657	0.0394
Men in two parent household (sample size: 4470)								
FDK (P _{dt})	0.0052 (0.0145)	0.0052 (0.0199)	1.6039 (0.9137)	-1.0631 (1.4446)	0.0029 (0.0085)	0.0153 (0.0248)	0.0107 (0.0268)	-0.0481 (0.0377)
R ²	0.0324	0.0506	0.0566	0.0501	0.0237	0.0476	0.0458	0.0492
French eligibility based on mother tongue French								
Women in one parent household (sample size: 840)								
FDK (P _{dt})	0.1734 (0.0749)*	0.1881 (0.0812)*	9.5430 (3.7649)*	10.0173 (3.0485)**	-0.0504 (0.0311)	0.2635 (0.0859)**	0.2691 (0.0839)**	-0.0014 (0.0469)
R ²	0.2369	0.2296	0.2356	0.2715	0.0725	0.2393	0.2598	0.1265
Women in two parent household (sample size: 6255)								
FDK (P _{dt})	-0.0086 (0.0260)	-0.0244 (0.0281)	1.5104 (1.3829)	-0.7953 (1.1878)	0.0122 (0.0179)	-0.0352 (0.0305)	-0.0096 (0.0313)	0.0116 (0.0197)
R ²	0.0562	0.0652	0.0861	0.0719	0.0187	0.0652	0.0691	0.0361
Men in two parent household (sample size: 5935)								
FDK (P _{dt})	0.0236 (0.0145)	0.0224 (0.0188)	1.5932 (0.8967)	-2.0629 (1.4475)	-0.0029 (0.0066)	0.0168 (0.0219)	0.0071 (0.0236)	-0.0504 (0.0330)
R ²	0.0299	0.0479	0.0679	0.0499	0.0150	0.0463	0.0461	0.0471

Note: Only parents of four- or five-year old children are included, so that all identification is from the timing of the switch to full-day kindergarten across different districts. Robust standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Model includes controls for French household, living in a region and year where the French school board offer full-day kindergarten, parental education dummies, a quadratic in parental age, a dummy variable for presence of older children, and Census Division and year fixed effects. Each column shows regression results for a different outcome variable for the parent type indicated in the row. All observation counts have been rounded to the nearest 5 to satisfy release conditions for use of the Census Master Files.

Table A1a. Full results for baseline regression

Depvar:	Women in single parent families			Hour per week:				
	In labour force	Employed	Weeks worked	Hours	1-15 hrs	>15 hrs	>30 hrs	>40 hrs
FDK ($F_i \times P_{dt}$)	0.0272 (0.0223)	0.0171 (0.0245)	1.7577 (1.1380)	1.3563 (1.0264)	-0.0198 (0.0122)	0.0390 (0.0256)	0.0324 (0.0259)	0.0031 (0.0187)
FDK available in local French school (P_{dt})	0.0180 (0.0180)	0.0296 (0.0192)	0.9979 (0.9044)	1.4717 (0.7596)	0.0096 (0.0108)	0.0189 (0.0198)	0.0392 (0.0193)*	0.0244 (0.0126)
French school eligible (F_i)	0.0125 (0.0248)	0.0185 (0.0265)	-0.5401 (1.2066)	0.7326 (1.0700)	0.0222 (0.0126)	-0.0001 (0.0269)	0.0328 (0.0268)	0.0028 (0.0168)
Youngest child aged 5	0.0038 (0.0078)	-0.0032 (0.0085)	0.2763 (0.3982)	-0.2537 (0.3470)	-0.0017 (0.0040)	-0.0009 (0.0088)	-0.0137 (0.0088)	-0.0017 (0.0058)
Has a child older than 4-5	-0.0844 (0.0081)**	-0.0967 (0.0088)**	-5.2733 (0.4148)**	-3.9786 (0.3619)**	0.0038 (0.0043)	-0.0951 (0.0092)**	-0.1051 (0.0092)**	-0.0215 (0.0061)**
Age	0.0497 (0.0097)**	0.0764 (0.0105)**	4.2570 (0.4921)**	2.7485 (0.4344)**	0.0029 (0.0050)	0.0716 (0.0109)**	0.0711 (0.0108)**	0.0094 (0.0072)
Age ²	-0.0007 (0.0001)**	-0.0010 (0.0002)**	-0.0574 (0.0072)**	-0.0370 (0.0064)**	0.0000 (0.0001)	-0.0010 (0.0002)**	-0.0010 (0.0002)**	-0.0001 (0.0001)
Education (less than high school omitted):								
High school diploma	0.1314 (0.0125)**	0.1432 (0.0132)**	7.1321 (0.6147)**	5.2820 (0.5153)**	0.0059 (0.0061)	0.1392 (0.0133)**	0.1269 (0.0130)**	0.0165 (0.0078)*
Trades certificate/ apprenticeship	0.1616 (0.0203)**	0.1750 (0.0225)**	7.8500 (1.0253)**	6.5511 (0.9295)**	0.0085 (0.0092)	0.1639 (0.0230)**	0.1288 (0.0227)**	0.0381 (0.0146)**
College/CEGEP graduate	0.2220 (0.0102)**	0.2340 (0.0111)**	10.4575 (0.5173)**	8.6050 (0.4443)**	0.0041 (0.0052)	0.2203 (0.0114)**	0.1867 (0.0113)**	0.0425 (0.0071)**
University certificate below BA	0.2179 (0.0271)**	0.2362 (0.0299)**	9.2726 (1.4068)**	8.8321 (1.2927)**	0.0055 (0.0125)	0.2230 (0.0322)**	0.1961 (0.0337)**	0.0523 (0.0228)*
Bachelors degree (BA)	0.2652 (0.0147)**	0.3087 (0.0166)**	14.3213 (0.8055)**	12.6026 (0.7424)**	0.0234 (0.0101)*	0.2885 (0.0182)**	0.2719 (0.0190)**	0.1151 (0.0153)**
Medicine/dentistry/vet sci	0.1225 (0.0825)	0.1258 (0.0896)	7.2136 (4.3649)	5.9215 (3.8962)	0.0063 (0.0385)	0.1447 (0.0939)	0.0601 (0.0943)	0.0720 (0.0698)
Certificate above BA	0.2665 (0.0249)**	0.3364 (0.0275)**	14.9867 (1.4216)**	11.9868 (1.3867)**	0.0308 (0.0197)	0.2892 (0.0337)**	0.2110 (0.0386)**	0.1121 (0.0301)**
Masters or above	0.3091 (0.0203)**	0.3683 (0.0245)**	15.1642 (1.4151)**	14.5883 (1.3504)**	0.0268 (0.0198)	0.3442 (0.0319)**	0.3307 (0.0363)**	0.1110 (0.0324)**
Years (1996 omitted):								
1991	-0.0528 (0.0124)**	0.0041 (0.0130)	3.6285 (0.6079)**	0.7340 (0.5011)	-0.0170 (0.0065)**	0.0121 (0.0132)	0.0469 (0.0128)**	-0.0027 (0.0072)
2001	0.0780 (0.0246)**	0.1324 (0.0263)**	9.1633 (1.1914)**	5.9996 (1.0530)**	-0.0390 (0.0127)**	0.1615 (0.0266)**	0.1217 (0.0264)**	0.0512 (0.0165)**
2006	0.0302 (0.0250)	0.0652 (0.0267)*	6.6566 (1.2181)**	3.6276 (1.0799)**	-0.0531 (0.0129)**	0.1014 (0.0272)**	0.0661 (0.0271)*	0.0394 (0.0170)*
Constant	-0.2376 (0.1623)	-0.8717 (0.1762)**	-55.0620 (8.2004)**	-34.1479 (7.2393)**	0.0136 (0.0828)	-0.8721 (0.1814)**	-0.9740 (0.1804)**	-0.1141 (0.1189)
Observations	15290	15290	15290	15290	15290	15290	15290	15290
R-squared	0.1283	0.1432	0.1565	0.1473	0.0431	0.1358	0.1297	0.0603

Note: Estimates are from equation (1). Robust standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Model includes controls for French household, living in a region and year where the French school board offer full-day kindergarten, parental education dummies, a quadratic in parental age, a dummy variable for presence of older children, and Census Sub-Division and year fixed effects. Each column shows regression results for a different outcome variable. All observation counts have been rounded to the nearest 5 to satisfy release conditions for use of the Census Master Files.

Table A1b. Full results for baseline regression – women in two parent families

Depvar:	Women in two parent families			Hour per week:				
	In labour force	Employed	Weeks worked	Hours	1-15 hrs	>15 hrs	>30 hrs	>40 hrs
FDK ($F_i \times P_{dt}$)	0.0245 (0.0084)**	0.0237 (0.0090)**	1.6434 (0.4414)**	0.9999 (0.3921)*	-0.0039 (0.0059)	0.0309 (0.0099)**	0.0173 (0.0104)	0.0141 (0.0070)*
FDK available in local French school (P_{dt})	0.0175 (0.0065)**	0.0191 (0.0069)**	0.1777 (0.3401)	0.8109 (0.2956)**	0.0037 (0.0048)	0.0123 (0.0076)	0.0150 (0.0077)	0.0164 (0.0049)**
French school eligible (F_i)	-0.0187 (0.0097)	-0.0190 (0.0105)	-1.1675 (0.5137)*	-0.9960 (0.4656)*	0.0067 (0.0069)	-0.0248 (0.0116)*	-0.0238 (0.0121)*	-0.0045 (0.0078)
Youngest child aged 5	0.0126 (0.0034)**	0.0111 (0.0036)**	0.3268 (0.1750)	0.4639 (0.1533)**	0.0006 (0.0023)	0.0106 (0.0039)**	0.0098 (0.0040)*	0.0019 (0.0026)
Has a child older than 4-5	-0.0590 (0.0041)**	-0.0586 (0.0044)**	-4.0861 (0.2105)**	-3.4789 (0.1910)**	0.0310 (0.0025)**	-0.0796 (0.0048)**	-0.1174 (0.0050)**	-0.0212 (0.0034)**
Age	0.0363 (0.0052)**	0.0602 (0.0055)**	3.1558 (0.2618)**	1.7420 (0.2312)**	0.0050 (0.0031)	0.0577 (0.0058)**	0.0404 (0.0059)**	-0.0062 (0.0038)
Age ²	-0.0005 (0.0001)**	-0.0008 (0.0001)**	-0.0435 (0.0037)**	-0.0247 (0.0033)**	-0.0001 (0.0000)	-0.0008 (0.0001)**	-0.0006 (0.0001)**	0.0001 (0.0001)
Education (less than high school omitted):								
High school diploma	0.0510 (0.0058)**	0.0643 (0.0061)**	2.9696 (0.2886)**	1.9876 (0.2438)**	0.0151 (0.0035)**	0.0534 (0.0063)**	0.0414 (0.0062)**	0.0022 (0.0036)
Trades certificate/ apprenticeship	0.1120 (0.0104)**	0.1215 (0.0111)**	5.2681 (0.5337)**	3.9705 (0.4622)**	0.0093 (0.0065)	0.1160 (0.0119)**	0.0622 (0.0121)**	0.0097 (0.0071)
College/CEGEP graduate	0.1428 (0.0052)**	0.1609 (0.0054)**	7.4809 (0.2610)**	5.1018 (0.2241)**	0.0159 (0.0033)**	0.1436 (0.0058)**	0.0950 (0.0058)**	0.0191 (0.0035)**
University certificate below BA	0.1403 (0.0113)**	0.1525 (0.0120)**	6.7455 (0.5876)**	6.4194 (0.5307)**	-0.0017 (0.0068)	0.1513 (0.0131)**	0.1428 (0.0136)**	0.0479 (0.0092)**
Bachelors degree (BA)	0.1406 (0.0063)**	0.1638 (0.0066)**	7.7081 (0.3176)**	5.5941 (0.2796)**	0.0245 (0.0042)**	0.1422 (0.0071)**	0.1024 (0.0072)**	0.0544 (0.0048)**
Medicine/dentistry/vet sci	0.2115 (0.0211)**	0.2375 (0.0226)**	11.4799 (1.0901)**	11.5345 (1.3061)**	-0.0150 (0.0140)	0.2553 (0.0263)**	0.1615 (0.0309)**	0.1612 (0.0276)**
Certificate above BA	0.1841 (0.0093)**	0.2109 (0.0099)**	9.4752 (0.4941)**	8.4616 (0.4649)**	0.0072 (0.0066)	0.2012 (0.0113)**	0.1615 (0.0124)**	0.1028 (0.0096)**
Masters or above	0.1916 (0.0093)**	0.2097 (0.0100)**	9.4084 (0.4992)**	8.3599 (0.4820)**	0.0114 (0.0065)	0.1971 (0.0114)**	0.1543 (0.0123)**	0.0947 (0.0093)**
Years (1996 omitted):								
1991	-0.0031 (0.0051)	-0.0028 (0.0054)	0.0475 (0.2596)	-0.7422 (0.2211)**	-0.0027 (0.0036)	-0.0039 (0.0058)	-0.0061 (0.0058)	-0.0278 (0.0035)**
2001	0.0389 (0.0096)**	0.0566 (0.0104)**	3.7914 (0.5083)**	3.3187 (0.4596)**	-0.0314 (0.0068)**	0.0845 (0.0114)**	0.0884 (0.0119)**	0.0218 (0.0077)**
2006	0.0092 (0.0097)	0.0076 (0.0106)	1.2896 (0.5158)*	1.9033 (0.4691)**	-0.0434 (0.0069)**	0.0466 (0.0117)**	0.0674 (0.0121)**	0.0047 (0.0079)
Constant	0.1095 (0.0909)	-0.4115 (0.0969)**	-24.6056 (4.5765)**	-8.8971 (4.0442)*	-0.0465 (0.0542)	-0.4492 (0.1022)**	-0.2603 (0.1028)*	0.2121 (0.0655)**
Observations	73305	73305	73305	73305	73305	73305	73305	73305
R-squared	0.0405	0.0457	0.0508	0.0432	0.0173	0.0397	0.0377	0.0232

Note: Estimates are from equation (1). Robust standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Model includes controls for French household, living in a region and year where the French school board offer full-day kindergarten, parental education dummies, a quadratic in parental age, a dummy variable for presence of older children, and Census Sub-Division and year fixed effects. Each column shows regression results for a different outcome variable. All observation counts have been rounded to the nearest 5 to satisfy release conditions for use of the Census Master Files.

Table A1c. Full results for baseline regression – men in two parent families

Depvar:	Men in two parent families			Hours per week:				
	In labour force	Employed	Weeks worked	Hours	1-15 hrs	>15 hrs	>30 hrs	>40 hrs
FDK ($F_i \times P_{dt}$)	0.0051 (0.0041)	0.0012 (0.0056)	0.7340 (0.2582)**	0.2025 (0.3872)	-0.0023 (0.0025)	0.0017 (0.0067)	-0.0053 (0.0075)	0.0215 (0.0107)*
FDK available in local French school (P_{dt})	0.0051 (0.0029)	0.0063 (0.0042)	0.0030 (0.1978)	0.1288 (0.2892)	0.0035 (0.0020)	0.0028 (0.0051)	0.0030 (0.0056)	-0.0011 (0.0079)
French school eligible (F_i)	-0.0074 (0.0049)	-0.0172 (0.0068)*	-1.2021 (0.3043)**	-2.2043 (0.4818)**	0.0071 (0.0026)**	-0.0245 (0.0078)**	-0.0301 (0.0086)**	-0.0615 (0.0124)**
Youngest child aged 5	0.0003 (0.0017)	-0.0010 (0.0022)	-0.1026 (0.1029)	-0.3205 (0.1521)*	0.0035 (0.0009)**	-0.0067 (0.0026)*	-0.0067 (0.0029)*	-0.0061 (0.0042)
Has a child older than 4-5	0.0030 (0.0022)	0.0081 (0.0029)**	0.5718 (0.1332)**	1.5956 (0.1886)**	-0.0024 (0.0012)*	0.0129 (0.0034)**	0.0185 (0.0038)**	0.0489 (0.0052)**
Age	0.0114 (0.0028)**	0.0418 (0.0040)**	2.2609 (0.1801)**	2.6312 (0.2521)**	-0.0025 (0.0016)	0.0480 (0.0046)**	0.0561 (0.0050)**	0.0374 (0.0064)**
Age ²	-0.0002 (0.0000)**	-0.0006 (0.0001)**	-0.0296 (0.0024)**	-0.0352 (0.0034)**	0.0000 (0.0000)	-0.0006 (0.0001)**	-0.0008 (0.0001)**	-0.0005 (0.0001)**
Education (less than high school omitted):								
High school diploma	0.0314 (0.0029)**	0.0549 (0.0039)**	2.9800 (0.1809)**	2.9157 (0.2566)**	-0.0026 (0.0015)	0.0622 (0.0045)**	0.0670 (0.0049)**	0.0284 (0.0067)**
Trades certificate/ apprenticeship	0.0327 (0.0038)**	0.0469 (0.0053)**	2.9516 (0.2278)**	2.8335 (0.3559)**	-0.0027 (0.0019)	0.0550 (0.0060)**	0.0586 (0.0066)**	0.0402 (0.0091)**
College/CEGEP graduate	0.0363 (0.0026)**	0.0612 (0.0035)**	3.4894 (0.1598)**	2.8862 (0.2279)**	-0.0014 (0.0013)	0.0691 (0.0041)**	0.0742 (0.0044)**	0.0349 (0.0059)**
University certificate below BA	0.0263 (0.0064)**	0.0513 (0.0080)**	2.9811 (0.3524)**	3.4529 (0.5392)**	-0.0040 (0.0028)	0.0655 (0.0090)**	0.0535 (0.0105)**	0.0538 (0.0147)**
Bachelors degree (BA)	0.0400 (0.0031)**	0.0739 (0.0039)**	3.9627 (0.1848)**	4.0838 (0.2660)**	-0.0005 (0.0017)	0.0857 (0.0046)**	0.0912 (0.0051)**	0.0783 (0.0075)**
Medicine/dentistry/vet sci	0.0503 (0.0075)**	0.0927 (0.0088)**	3.6525 (0.5441)**	10.4402 (1.0024)**	-0.0128 (0.0013)**	0.1149 (0.0111)**	0.1082 (0.0147)**	0.2539 (0.0254)**
Certificate above BA	0.0354 (0.0055)**	0.0775 (0.0063)**	4.3744 (0.3004)**	4.9088 (0.4623)**	-0.0046 (0.0027)	0.0903 (0.0077)**	0.0966 (0.0087)**	0.1085 (0.0144)**
Masters or above	0.0335 (0.0045)**	0.0621 (0.0055)**	3.0554 (0.2732)**	4.6735 (0.3738)**	-0.0021 (0.0024)	0.0784 (0.0064)**	0.0863 (0.0071)**	0.1182 (0.0107)**
Years (1996 omitted):								
1991	0.0174 (0.0022)**	0.0149 (0.0032)**	1.3382 (0.1482)**	-1.3881 (0.2204)**	-0.0019 (0.0014)	0.0079 (0.0039)*	0.0177 (0.0043)**	-0.0938 (0.0060)**
2001	0.0061 (0.0048)	0.0289 (0.0066)**	2.3063 (0.2990)**	3.0927 (0.4802)**	-0.0100 (0.0026)**	0.0408 (0.0077)**	0.0570 (0.0085)**	0.0656 (0.0122)**
2006	-0.0116 (0.0050)*	0.0053 (0.0068)	0.3654 (0.3067)	1.3830 (0.4859)**	-0.0067 (0.0027)*	0.0131 (0.0079)	0.0273 (0.0087)**	0.0257 (0.0125)*
Constant	0.7308 (0.0510)**	0.0929 (0.0735)	0.7991 (3.2856)	-10.3558 (4.5870)*	0.0610 (0.0289)*	-0.0616 (0.0841)	-0.2487 (0.0911)**	-0.2551 (0.1154)*
Observations	67730	67730	67730	67730	67730	67730	67730	67730
R-squared	0.0228	0.0368	0.0546	0.0471	0.011	0.0353	0.0356	0.041

Note: Estimates are from equation (1). Robust standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Model includes controls for French household, living in a region and year where the French school board offer full-day kindergarten, parental education dummies, a quadratic in parental age, a dummy variable for presence of older children, and Census Sub-Division and year fixed effects. Each column shows regression results for a different outcome variable. All observation counts have been rounded to the nearest 5 to satisfy release conditions for use of the Census Master Files.

Table A2. Estimated treatment effects from equation (1) but French school availability defined as French language school in parents' CSD of residence rather than within a 40-minute drive

Dep. Var:	In labour force	Employed	Weeks worked	Hours per week:				
				Hours	1-15 hrs	>15 hrs	>30 hrs	>40 hrs
French eligibility based on knowledge of French								
Women in one parent household (sample size: 15,290)								
FDK ($F_i \times P_{dt}$)	0.0192 (0.0234)	0.0158 (0.0256)	1.8497 (1.1850)	1.5102 (1.0731)	-0.0245 (0.0132)	0.0406 (0.0268)	0.0393 (0.0271)	0.0068 (0.0196)
R ²	0.1299	0.1445	0.1586	0.1485	0.0443	0.1370	0.1309	0.0626
Women in two parent household (sample size: 73,305)								
FDK ($F_i \times P_{dt}$)	0.0219 (0.0089)*	0.0222 (0.0095)*	1.4484 (0.4660)**	1.0401 (0.4140)*	-0.0072 (0.0062)	0.0331 (0.0105)**	0.0194 (0.0109)	0.0150 (0.0074)*
R ²	0.0415	0.0469	0.0531	0.0441	0.0178	0.0407	0.0382	0.0236
Men in two parent household (sample size: 67,730)								
FDK ($F_i \times P_{dt}$)	0.0069 (0.0044)	0.0060 (0.0059)	0.8636 (0.2726)**	0.5046 (0.4097)	-0.0011 (0.0027)	0.0067 (0.0071)	0.0013 (0.0079)	0.0295 (0.0113)**
R ²	0.0232	0.0379	0.0570	0.0482	0.0112	0.0362	0.0367	0.0423
French eligibility based on home language French								
Women in one parent household (sample size: 15,290)								
FDK ($F_i \times P_{dt}$)	0.0750 (0.0365)*	0.0855 (0.0397)*	3.9219 (1.8976)*	4.0583 (1.5860)*	0.0050 (0.0160)	0.0849 (0.0406)*	0.1101 (0.0402)**	0.0138 (0.0264)
R ²	0.1300	0.1445	0.1583	0.1484	0.0442	0.1373	0.1311	0.0622
Women in two parent household (sample size: 73,305)								
FDK ($F_i \times P_{dt}$)	0.0193 (0.0144)	0.0171 (0.0155)	1.3009 (0.7563)	-0.2665 (0.6597)	0.0263 (0.0089)**	-0.0159 (0.0168)	-0.0040 (0.0176)	-0.0027 (0.0112)
R ²	0.0412	0.0466	0.0529	0.0440	0.0180	0.0407	0.0387	0.0229
Men in two parent household (sample size: 67,730)								
FDK ($F_i \times P_{dt}$)	0.0071 (0.0080)	-0.0004 (0.0104)	0.6513 (0.4845)	0.7190 (0.6754)	-0.0001 (0.0050)	0.0036 (0.0124)	0.0011 (0.0135)	0.0444 (0.0179)*
R ²	0.0230	0.0378	0.0568	0.0483	0.0113	0.0362	0.0367	0.0423
French eligibility based on mother tongue French								
Women in one parent household (sample size: 15,290)								
FDK ($F_i \times P_{dt}$)	0.1275 (0.0337)**	0.0992 (0.0369)**	3.3350 (1.7422)*	5.0764 (1.4536)**	-0.0018 (0.0181)	0.1254 (0.0378)**	0.1247 (0.0373)**	0.0311 (0.0263)
R ²	0.1304	0.1444	0.1583	0.1481	0.0441	0.1371	0.1305	0.0622
Women in two parent household (sample size: 73,305)								
FDK ($F_i \times P_{dt}$)	0.0268 (0.0127)*	0.0387 (0.0136)**	1.2307 (0.6636)	1.2412 (0.5747)*	0.0171 (0.0082)*	0.0234 (0.0148)	0.0370 (0.0153)*	0.0083 (0.0098)
R ²	0.0411	0.0464	0.0528	0.0437	0.0180	0.0404	0.0383	0.0229
Men in two parent household (sample size: 67,730)								
FDK ($F_i \times P_{dt}$)	0.0213 (0.0067)**	0.0272 (0.0090)**	1.7069 (0.4105)**	1.1930 (0.5878)*	-0.0054 (0.0035)	0.0309 (0.0106)**	0.0267 (0.0115)*	0.0305 (0.0155)*
R ²	0.0232	0.0380	0.0571	0.0484	0.0112	0.0364	0.0368	0.0424

Note: Estimates are from equation (1). Robust standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Model includes controls for French household, living in a region and year where the French school board offer full-day kindergarten, parental education dummies, a quadratic in parental age, a dummy variable for presence of older children, and Census Sub-Division and year fixed effects. Each column shows regression results for a different outcome variable. All observation counts have been rounded to the nearest 5 to satisfy release conditions for use of the Census Master Files.

Table A3. Placebo estimates of the effect of full-day kindergarten availability by type of parent and definition of French eligibility; sample is non-French school eligible parents of four- to five-year-olds

Dep. Var:	In labour force	Employed	Weeks worked	Hours per week:				
				Hours	1-15 hrs	>15 hrs	>30 hrs	>40 hrs
French eligibility based on knowledge of French								
Women in one parent household (sample size: 13,410)								
FDK (P_{dt})	0.0218 (0.0242)	0.0301 (0.0261)	-0.0613 (1.1565)	1.3151 (1.0465)	0.0217 (0.0130)	0.0065 (0.0266)	0.0441 (0.0264)	0.0166 (0.0156)
R^2	0.0994	0.1118	0.1239	0.1122	0.0137	0.1034	0.0940	0.0315
Women in two parent household (sample size: 59,485)								
FDK (P_{dt})	-0.0186 (0.0099)	-0.0088 (0.0107)	-1.3949 (0.5185)**	-0.5690 (0.4777)	0.0049 (0.0069)	-0.0093 (0.0118)	-0.0189 (0.0122)	-0.0100 (0.0081)
R^2	0.0308	0.0361	0.0404	0.0322	0.0092	0.0299	0.0278	0.0132
Men in two parent household (sample size: 54,985)								
FDK (P_{dt})	-0.0046 (0.0052)	-0.0106 (0.0069)	-0.7469 (0.2943)*	-1.6228 (0.4917)**	0.0043 (0.0026)	-0.0158 (0.0077)*	-0.0174 (0.0086)*	-0.0522 (0.0126)**
R^2	0.0142	0.0245	0.0391	0.0286	0.0023	0.0245	0.0247	0.0239

Note: Only parents of non-French-school-eligible four- or five-year old children are included, so that all identification is from the timing of the switch to full-day kindergarten across different districts. standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Model includes controls for French household, living in a region and year where the French school board offer full-day kindergarten, parental education dummies, a quadratic in parental age, a dummy variable for presence of older children, and Census Division and year fixed effects. Each column shows regression results for a different outcome variable for the parent type indicated in the row. All observation counts have been rounded to the nearest 5 to satisfy release conditions for use of the Census Master Files.

Table A4. Baseline estimates, reweighted

Dep. Var:	In labour force	Employed	Weeks worked	Hour per week:				
				Hours	1-15 hrs	>15 hrs	>30 hrs	>40 hrs
French eligibility based on knowledge of French								
Women in one parent household (sample size: 15,290)								
FDK ($F_i \times P_{dt}$)	0.0272 (0.0223)	0.0171 (0.0245)	1.7577 (1.1380)	1.3563 (1.0264)	-0.0198 (0.0122)	0.0390 (0.0256)	0.0324 (0.0259)	0.0031 (0.0187)
R ²	0.1283	0.1432	0.1565	0.1474	0.0432	0.1359	0.1299	0.0603
Women in two parent household (sample size: 73,305)								
FDK ($F_i \times P_{dt}$)	0.0245 (0.0084)**	0.0237 (0.0090)**	1.6434 (0.4414)**	0.9999 (0.3921)*	-0.0039 (0.0059)	0.0309 (0.0099)**	0.0173 (0.0104)	0.0141 (0.0070)*
R ²	0.0406	0.0457	0.0509	0.0432	0.0173	0.0398	0.0378	0.0231
Men in two parent household (67,730)								
FDK ($F_i \times P_{dt}$)	0.0051 (0.0041)	0.0012 (0.0056)	0.7340 (0.2582)	0.2025 (0.3872)	-0.0023 (0.0025)	0.0017 (0.0067)	-0.0053 (0.0075)	0.0215 (0.0107)
R ²	0.0228	0.0369	0.0547	0.0473	0.0110	0.0353	0.0357	0.0412
French eligibility based on home language French								
Women in one parent household (15,290)								
FDK ($F_i \times P_{dt}$)	0.0845 (0.0347)*	0.0828 (0.0377)*	3.7442 (1.8284)*	3.6228 (1.5181)*	0.0076 (0.0148)	0.0812 (0.0387)*	0.0946 (0.0384)*	0.0054 (0.0254)
R ²	0.1284	0.1432	0.1562	0.1473	0.0431	0.1361	0.1300	0.0599
Women in two parent household (73,305)								
FDK ($F_i \times P_{dt}$)	0.0284 (0.0137)*	0.0249 (0.0148)	2.0096 (0.7212)**	-0.0911 (0.6290)	0.0300 (0.0085)**	-0.0114 (0.0161)	-0.0045 (0.0169)	-0.0015 (0.0107)
R ²	0.0403	0.0454	0.0507	0.0431	0.0176	0.0397	0.0383	0.0224
Men in two parent household (67,730)								
FDK ($F_i \times P_{dt}$)	0.0066 (0.0077)	-0.0054 (0.0099)	0.6736 (0.4642)	0.4132 (0.6456)	-0.0021 (0.0047)	-0.0011 (0.0119)	-0.0063 (0.0129)	0.0369 (0.0171)*
R ²	0.0226	0.0368	0.0545	0.0473	0.0110	0.0353	0.0357	0.0412
French eligibility based on mother tongue French								
Women in one parent household (15,290)								
FDK ($F_i \times P_{dt}$)	0.1343 (0.03214)**	0.0983 (0.0354)**	3.2359 (1.6881)	4.7161 (1.4041)**	0.0017 (0.0167)	0.1205 (0.0362)**	0.1121 (0.0358)**	0.0245 (0.0251)
R ²	0.1289	0.1432	0.1562	0.1470	0.0430	0.1360	0.1295	0.0598
Women in two parent household (73,305)								
FDK ($F_i \times P_{dt}$)	0.0359 (0.0120)**	0.0459 (0.0129)**	1.9598 (0.6301)**	1.3874 (0.5460)*	0.0199 (0.0078)*	0.0276 (0.0140)*	0.0360 (0.0146)*	0.0089 (0.0093)
R ²	0.0401	0.0453	0.0506	0.0428	0.0175	0.0394	0.0379	0.0224
Men in two parent household (sample size: 67,730)								
FDK ($F_i \times P_{dt}$)	0.0197 (0.0063)**	0.0207 (0.0086)*	1.6344 (0.3923)**	0.8650 (0.5606)	-0.0067 (0.0033)*	0.0242 (0.0101)*	0.0176 (0.0110)	0.0242 (0.0148)
R ²	0.0228	0.0369	0.0548	0.0474	0.0110	0.0355	0.0358	0.0413

Note: Estimates are from equation (1) but using weighting method from footnote 15. Robust standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Model includes controls for French household, living in a region and year where the French school board offer full-day kindergarten, parental education dummies, a quadratic in parental age, a dummy variable for presence of older children, and Census Sub-Division and year fixed effects. Each column shows regression results for a different outcome variable for the parent type indicated in the row. All observation counts have been rounded to the nearest 5 to satisfy release conditions for use of the Census Master Files.

Table A5. Comparison of estimated treatment effects from models that drop CSDs that never have a change in full-day kindergarten availability, and from models that incorporate region by year fixed effects

Dep. Var:	In labour force	Employed	Weeks worked	Hours per week:				
				Hours	1-15 hrs	>15 hrs	>30 hrs	>40 hrs
Women in one parent household								
Baseline:	0.0272 (0.0223)	0.0171 (0.0245)	1.7577 (1.1380)	1.3563 (1.0264)	-0.0198 (0.0122)	0.0390 (0.0256)	0.0324 (0.0259)	0.0031 (0.0187)
Drop never changers:	0.0289 (0.0225)	0.0153 (0.0248)	1.5572 (1.1479)	1.2217 (1.0524)	-0.0136 (0.0121)	0.0335 (0.0260)	0.0197 (0.0265)	0.0093 (0.0196)
Region x year:	0.0192 (0.0234)	0.0158 (0.0256)	1.8497 (1.1850)	1.5102 (1.0731)	-0.0245 (0.0132)	0.0406 (0.0268)	0.0393 (0.0271)	0.0068 (0.0196)
Women in two parent household								
Baseline:	0.0245 (0.0084)**	0.0237 (0.0090)**	1.6434 (0.4414)**	0.9999 (0.3921)*	-0.0039 (0.0059)	0.0309 (0.0099)**	0.0173 (0.0104)	0.0141 (0.0070)*
Drop never changers:	0.0231 (0.0086)**	0.0207 (0.0092)*	1.4029 (0.4498)**	0.9112 (0.3972)*	-0.0036 (0.0060)	0.0276 (0.0101)**	0.0153 (0.0106)	0.0136 (0.0070)
Region x year:	0.0219 (0.0089)*	0.0222 (0.0095)*	1.4484 (0.4660)**	1.0401 (0.4140)*	-0.0072 (0.0062)	0.0331 (0.0105)**	0.0194 (0.0109)	0.0150 (0.0074)*
Men in two parent household								
Baseline:	0.0051 (0.0041)	0.0012 (0.0056)	0.7340 (0.2582)**	0.2025 (0.3872)	-0.0023 (0.0025)	0.0017 (0.0067)	-0.0053 (0.0075)	0.0215 (0.0107)*
Drop never changers:	0.0045 (0.0042)	0.0001 (0.0057)	0.5898 (0.2619)*	0.0860 (0.3916)	-0.0025 (0.0026)	-0.0004 (0.0068)	-0.0078 (0.0076)	0.0173 (0.0109)
Region x year:	0.0069 (0.0044)	0.0060 (0.0059)	0.8636 (0.2726)**	0.5046 (0.4097)	-0.0011 (0.0027)	0.0067 (0.0071)	0.0013 (0.0079)	0.0295 (0.0113)**

Note: Estimates are from equation (1). Only results for the definition of French-school eligibility based on knowledge of French shown. Robust standard errors in parentheses. * significant at 5% level; ** significant at 1% level. Model includes controls for French household, living in a region and year where the French school board offer full-day kindergarten, parental education dummies, a quadratic in parental age, a dummy variable for presence of older children, and Census Sub-Division and year fixed effects. Each column shows regression results for a different outcome variable for the parent type and model indicated in the row. All observation counts have been rounded to the nearest 5 to satisfy release conditions for use of the Census Master Files.