

School Entry Dates and Overall Academic Attainment

Recently, there has been increased interest in determining the appropriate age for children to start school and in understanding the effect of school entry policies on their academic and life achievement. Research, policy and public opinion remain somewhat divided as to what school readiness means and whether children benefit most from entering school earlier or later.

While some parents make decisions to hold a child back or to enroll them early based on their own or professionals' assessment of the child's readiness to begin school, school entry cut-off dates determine the age at which the large majority of children start school. As a result, children whose birthdays differ by as little as a few days enter school a year apart. Because of this, school entry dates may have effects on aspects of a child's life ranging from their short term academic achievement to their eventual lifetime earnings, leaving parents and policymakers with difficult choices.

Research to date has presented a somewhat unclear picture of the advantages or disadvantages of entering school at a particular age. For example, later school entry has been associated with short-term educational advantages for children who are thereby older than their classmates. However, these advantages tend to even out by about the third grade.¹ In addition, later school entry may be associated with problems of social adjustment and lower total educational attainment.

Studies also seem to demonstrate that chronological age in itself is not a predictor of academic success, and therefore policy changes or parental decisions to ensure children are older at school entry may be unsuccessful in improving academic achievement. In fact, data suggest that delaying educational experiences may place children at a disadvantage in the long term.² This issue is of particular importance among low income children and those at high risk of dropping out. For those children who may drop out early or quit school at the youngest legal age, having a birthday which falls just before the cut-off date may allow them to gain one year more of education as opposed to those students whose birthdays fall just after the cut-off. This is particularly important because research shows that total number of years in school is associated with better outcomes. For example, the number of years of education that a child has completed is associated with their future earnings. Evidence suggests that children who were born just before the school entry cut-off date, and therefore gained an extra year of education, had higher incomes than those who were born just after the date and had to wait until the next year to enter school.^{3,4}

A researcher at Case Western Reserve University in the department of Economics is working to add to this body of knowledge.

THE SCHUBERT CENTER FOR CHILD STUDIES in the College of Arts and Sciences at Case Western Reserve University promotes multidisciplinary research on children and childhood. Our goal is to build and enhance connections among research, policy, and educational initiatives at the University and with the community. The Schubert Center's focus is on children and childhood from infancy through adolescence in local, national, and international contexts.

Jill E. Korbin, Ph.D. DIRECTOR | Molly Irwin, M.P.H. DIRECTOR, CHILD POLICY INITIATIVE | Eileen Anderson-Fye, Ed.D. ASSOCIATE DIRECTOR | Elizabeth Short, Ph.D. ASSOCIATE DIRECTOR
Jessica McRitchie ADMINISTRATOR | Gayle Channing Tenenbaum, M.S.W. CONSULTANT | Donald Freedheim, Ph.D. FOUNDING DIRECTOR | Michelle McTygue DESIGN



Schubert Center for Child Studies
614A Crawford Hall
10900 Euclid Avenue
Cleveland, OH 44106-7179

216.368.0540
[www.case.edu/artsci/schubert/
schubertcenter@case.edu](http://www.case.edu/artsci/schubert/schubertcenter@case.edu)



Heather Royer, PhD

Assistant Professor of
Economics

Weatherhead School of
Management

Case Western Reserve
University

The Effect of Female Education on Fertility and Infant Health: Evidence from School Entry Policies Using Exact Date of Birth

Dr. Heather Royer is interested in understanding the factors that determine infant health. Her recent work using school entry cut-off dates to understand the impact of age at school entry on female education, fertility and birth outcomes adds knowledge to this important debate regarding school entry policies. Her research interests lie at the intersection of health, labor economics, public finance and applied econometrics. Through her work, Dr. Royer has developed new statistical methods to estimate the effects of mother's age, education and prenatal care on infant health.

STUDY DESIGN

Dr. Royer and her colleague, Justin McCrary, were interested in understanding the effect of female education on fertility and infant health. For the study, they compared fertility and infant health outcomes for mothers born just before and just after the school entry cut-off date.

Birth certificate data for California and Texas were acquired from the Department of Health of each state. The sample included data from 1989-2001 from Texas and from 1989-2002 from California. Data were restricted to include only the mothers born in the state in which they gave birth, who were first time mothers and, for the infant health analysis, who were 23 years old or younger at the time of birth. School entry policies were used to obtain the kindergarten entry cut-off date for each state.

STUDY RESULTS

Drs. Royer and McCrary found that the school entry policies had an effect on a woman's education and on the characteristics of her mate, but had a small and statistically insignificant effect on fertility choices and infant health.

The study showed that among young mothers, school entry policies affected educational attainment at first birth. Almost one-fourth of Texas mothers born after the school entry date had a year less education than they otherwise would, had they been born before the entry date. In California, 15% of mothers born after the school entry date had a year less education than those born before it. Furthermore, the authors found that school entry policies affected not only the number of years of high school a woman had completed by the time of her first birth, but also the number of years of college.

It is important to note, however, that not all women's education at motherhood will be affected by school entry dates. Those women most

likely to be affected are those who are at risk of dropping out of school and those who are likely to quit school at the youngest age allowable by law. This is demonstrated by the finding that school entry policies exert the greatest impact on the education of those women who give birth at young ages. The authors found that the impact tended to be on women who had generally achieved low levels of education, with the largest effects noted in the range of eighth to twelfth grade. If women quit school at the youngest age allowed by law, or discontinue their education because of motherhood, those women who just missed the school entry cut-off date will have one less year of total education than those whose birthdates fell just before the cut-off date. This reality has important implications for a woman's long-term life opportunities.

The study also found that school entry policies were associated with characteristics of a woman's mate. Specifically, women born just after the entry date had younger and less educated mates than women born just before. Presumably this is because those women born just after the school entry date complete less education themselves. Research has shown that educational attainment of mates is often concordant. Men and women of similar education tend to pair, suggesting an increase in a woman's education leads to a mate of higher education.

However, despite the impact on women, the study found school entry dates did not significantly impact infant health. Women born just before and just after the entry date had similar prenatal behaviors such as rates of smoking and prenatal care, and gave birth to children of similar health as measured by birthweight, prematurity and rate of infant mortality. The authors found it somewhat surprising that there were no documented

KEY FINDINGS

Women born just after the school entry date as compared to those born just before the school entry date:

- Have substantially less schooling
- Are equally likely to become mothers
- Give birth at similar ages
- Give birth to similarly healthy infants

differences in infant health given that school entry policies lead to economically important differences in the women's education as well as the age and education of the women's mates, all of which are related to higher total household permanent income.

This study examined the consequences of school entry policies on the age at which children begin school. Parents of children with birthdays near the school entry date may be interested in these findings, particularly if they view their child as at risk of dropping out of school. Moreover, there continues to be an active policy debate regarding the appropriate age for school entry. Several states have changed the school entry date to earlier in the year in order to raise the average age of kindergartners, and parents are increasingly making decisions to hold children born near the date back a year. This study suggests that even if holding children out a year or moving back the entry date does succeed in improving the preparedness of children for an increasingly intensive kindergarten curriculum, such a policy shift is not without costs and may create both winners and losers.

IMPLICATIONS FOR POLICY AND PRACTICE

Dr. Royer's work is important because of the well-documented effects of education on income, fertility and health. Data show that an additional year of education leads to an average 15% increase in annual earnings in the United States.⁵ Additionally, women who have more education and a higher income tend to have fewer and healthier children.

Therefore, the issue of discontinuity in educational attainment due to the combination of school entry policies and social factors that cause certain students to stop school earlier is an issue of importance for policy makers, teachers and parents. To address it, policy could be used to raise educational attainment by either affecting school exit decisions by raising the minimum drop out age, or by affecting school entrance decisions by lowering the age at school entry.

Parent and teacher perceptions of readiness for school are also important factors in a child's total educational attainment. Although parents can often petition for early enrollment for a child whose birth date falls just after the school entry cut-off, most children start school according to the legal school entry dates. Some parents also choose to enter their children a year late for several reasons. Most commonly, parents will hold a child back on the basis of beliefs about a child's readiness for

school, or out of a desire to give the child an advantage. Research suggests that a child's ability to perform the skills that determine success in school is not enhanced by waiting an additional year to enroll. In addition, any advantage that a student may gain from being a year older than their peers typically disappears quite early in their educational career. While Dr. Royer's work does not specifically address the practice of holding a child back from school entry, her results suggest that some parents who hold their children back from school entry may inadvertently be shortening their child's total educational career.

Teachers and school administrators have also sometimes encouraged later start dates for children not deemed mature enough for school. This perspective is based largely on outdated research that suggested that children needed to achieve a certain maturity before they would be able to succeed in school.⁶ There is a more recent consensus among researchers that children, particularly those who lack educational opportunities outside of the school setting, may be best served by being placed in an interactive instructional environment in which they will be able to form the necessary abilities. Schools have the potential to be the environments in which children learn the skills and behaviors necessary for successful learning.

Some parents choose to hold their children back from kindergarten for an extra year to give them a perceived educational, social or athletic advantage. Increasingly, research does not support this practice, yet 10% of American parents defer their children's kindergarten entry.

Children most likely to be held back are:

- Middle or upper middle income
- Boys
- Those children whose birthdays fall just before the school entry cut-off date

The notion of holding children back for a year can only confer advantage on children who will be exposed to other types of educational activities during that time – typically those from middle or upper income families. Parents of children from low socio-economic backgrounds are more likely to comply with school entry policies. This in itself may create problems in the classroom where children in the same class have a larger range in age and an ever widening set of skills and experiences.

¹ Marshall, Hermine H. (2003). An opportunity deferred or an opportunity taken? An updated look at delaying kindergarten entry. *Young Children*, 58:84-93.

² Stipek, Deborah C. (2003). School entry age. *Encyclopedia on Early Childhood Development*. <http://www.excellence-earlychildhood.ca/documents/StipekANGxp.pdf>.

³ Leigh, Andrew and Chris Ryan. (2008). Estimating returns to education using different natural experiment techniques. *Economics of Education Review*, in press.

⁴ Card, David E. (1999). The causal effect of education on earnings. In Orley Ashenfelter and David E. Card, eds., *The Handbook of Labor Economics*, Vol. 3A. Amsterdam: Elsevier.

⁵ Card, David E. (1999). The causal effect of education on earnings. In Orley Ashenfelter and David E. Card, eds., *The Handbook of Labor Economics*, Vol. 3A. Amsterdam: Elsevier.

⁶ Marshall, Hermine H. (2003). An opportunity deferred or an opportunity taken? An updated look at delaying kindergarten entry. *Young Children*, 58:84-93