



# The effects of school desegregation on infant health

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## ABSTRACT

This paper examines the effects of school desegregation on infant health using birth certificate data from 1970 to 2002 and a multiple difference-in-differences approach that exploits variation in the timing of desegregation across counties. Using cohort fixed effects and county fixed effects, I find that among black mothers in Southern regions, school desegregation reduces preterm births by 1.7 percentage points. These results are robust to county-specific cohort trends, county-specific year trends, and state-specific cohort fixed effects. In addition, school desegregation increases maternal education and prenatal care in the first trimester and decreases the likelihood of the child having a teenage father. These may be important pathways to improved infant health. This paper adds to the growing literature on the importance of school desegregation in areas beyond academic achievement.

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## 1. Introduction

In the United States, a black infant is twice as likely as a white infant to be born prematurely. Preterm birth is a major determinant of health complications in infants (Moster et al., 2008). It can present significant emotional and economic costs for families and societies (Butler et al., 2007). It is also correlated with lower educational attainment and lower earnings later in life (Behrman and Rosenzweig, 2002; Currie and Hyson, 1999; Moster et al., 2008).

The multitude of negative consequences of preterm births makes the cause of the disparity in preterm birth rates between blacks and whites a pressing question for research and policy. Evidence suggests that segregation is one of the leading causes of inequality in health (Almond et al., 2006; Williams and Collins, 2001; Osypuk and Acevedo-Garcia, 2008). School segregation is an area of particular interest in this regard because maternal education is linked to better infant health (Currie and Moretti, 2003) and because it is policy amenable. Prior to 1954, schools in the Southern states were legally segregated, and schools outside of the South were also highly segregated because of differences in families' socioeconomic status, individual preferences, and school and housing policies. In 1954, the United States Supreme Court ruled that providing separate schools for blacks and whites was "inherently unequal." Under court orders, school districts integrated from the 1950s to the 1980s. School desegregation increased the funding and exposure to white students for a typical black student (Johnson, 2011; Guryan, 2004; Reber, 2005, 2010; Rossell and Armor, 1996; Welch and Light, 1987; Wells, 2009). Previous

research has documented the positive effects of school desegregation on education, labor market, and health outcomes (Bergman, 2015; Billings et al., 2014; Johnson, 2011; Guryan, 2004; Reber, 2005, 2010; Rivkin, 2000; Weiner et al., 2009). However, it is unclear whether school desegregation has contributed to positive intergenerational health effects for blacks.

This paper aims to fill this gap in the literature by examining whether school desegregation affects the health of infants born to black mothers. The staggered rollout of court-ordered school desegregation provides a quasi-experimental setting to identify the causal effects of school desegregation on intergenerational outcomes. I use individual-level birth certificate data that provide information on parental characteristics and infant health. I exploit county and cohort variation, taking advantage of the difference in implementation timing across counties and differences in exposure to desegregated school across cohorts. The analysis indicates that in Southern counties, school desegregation improves infant health among black mothers. School desegregation also increases maternal education at birth, decreases the probability that the father is a teenager, and increases prenatal visits in the first trimester. These are plausibly important pathways for the positive relationship between maternal education and infant health. In addition, I present suggestive evidence that finds higher initial black enrollment is associated with larger gains among blacks, suggesting increases in per pupil funding plays an important role in improving blacks' maternal education and infant health.

## 2. Literature review

The causes of preterm births may include a set of overlapping and combined biologic, psychological, and social factors (Butler et al.,

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2007). In a literature review on the risk factors for preterm births, Berkowitz and Papiernik (1993) found that established individual-level risk factors for preterm births include single marital status, low socioeconomic status, and cigarette smoking. Rubalcava and Teruel (2004) found that mothers' cognitive ability is positively associated with children's height, perhaps due to better capacity to take advantage of household and community resources. In addition, Rubalcava and Teruel (2004) suggest that high maternal reasoning ability plays an important role in improving children's health. Other research has examined community-level risk factors. Osypuk and Acevedo-Garcia (2008) found that living in metropolitan areas with high levels of residential racial segregation along multiple dimensions is associated with higher rates of preterm births. They suggest that individual and neighborhood levels of stress and deprivation are the mechanisms of this relationship. Relatedly, Kaplan et al. (2017) found that a higher local unemployment rate is associated with an increase in the probability of having a low-birth-weight baby. These effects are concentrated among infants born to relatively disadvantaged mothers as measured by education and income.

Empirical evidence, however, has not reached a consensus on whether more years of schooling induce better infant health (Currie and Moretti, 2003; McCrary and Royer, 2011; Oreopoulos et al., 2006; Black et al., 2005). Further, much of the existing research focuses only on the effects of increases in the quantity of schooling on infant health, as opposed to increases in school quality (Currie and Moretti, 2003; McCrary and Royer, 2011; Oreopoulos et al., 2006; Black et al., 2005). For example, Currie and Moretti (2003) used the opening of new colleges to identify the effects of maternal education on infant health for white mothers. McCrary and Royer (2011) used age-at-school-entry policies to identify the effects of more education on fertility and infant health, focusing on women who were at risk of dropping out. Black et al. (2005) used changes in compulsory education policies to identify the effects of an increase in mothers' education on children's test scores. In Black et al. (2005)'s study, school quality also increased, as measured by school resources in Norway, but the original goal of the policy under examination was to increase quantity of schooling. The current paper expands on this literature by looking at a change in education conditions that has consequences for school quality in terms of per-pupil funding and peer effects.

Further, this paper adds to an understanding of the effects of school desegregation on education and fertility outcomes (Ashenfelter et al., 2006; Bifulco et al., 2015; Bergman, 2015; Guryan, 2004; Johnson, 2011; Liu et al., 2012; Reber, 2005, 2010). Previous findings on school integration and birth outcomes have been mixed. Liu et al. (2012) compared teen pregnancy rates in school districts that desegregated in 1970 and those that desegregated in 1980 and found that school desegregation decreases black women's rates of teenage pregnancy. In the current paper, I refine their empirical strategy by exploiting variation in the year in which school desegregation takes place. My results differ from those of Bifulco et al. (2015), who found that school desegregation increases black women's likelihood of giving birth as teenagers. This is probably due to a difference in empirical strategy: Bifulco et al. (2015) compared teenage pregnancy before and after the implementation of school desegregation within a county, controlling for county-specific time trends and region-specific year fixed effects. However, because they failed to control for cohort fixed effects, their results may reflect cohort differences. The research design of the current paper can be thought of as a refinement of the estimation strategies used by Bifulco et al. (2015) and Liu et al. (2012), replacing year differences with cohort fixed effects and county fixed effects. (Adding county-specific time trends does not affect the results.) In addition, the current paper extends their strategies by looking at infant health outcomes rather than merely number of children.

### 3. Background of school desegregation

#### 3.1. History of school desegregation

The *Plessy v. Ferguson* decision of 1896 allowed state-sponsored segregation in schools. The ruling in the *Brown v. Board of Education* case in 1954 overturned the *Plessy v. Ferguson* decision and ordered schools to desegregate with "all deliberate speed." However, the decision did not specify an explicit timeline. Most school districts did not adopt major school desegregation voluntarily. Individual cases had to be filed by civil rights groups on a case-by-case basis. Thus, the timing of the implementation of school desegregation varied across school districts. The subsequent court orders and timelines are well-documented by previous research (Cascio et al., 2008, 2010; Guryan, 2004; Johnson, 2011; Reber, 2005; Welch and Light, 1987).

#### 3.2. How school desegregation changed school experiences for blacks

The implementation of school desegregation changed the quality of schools attended by black students in two ways. First, it changed the composition of black students' peer groups (Guryan, 2004; Reber, 2005, 2010; Rossell and Armor, 1996; Welch and Light, 1987; Wells, 2009). Guryan (2004) found that black students experienced a sharp increase in exposure to white students by 15 percentage points in the initial year of desegregation plan implementation. This was followed by additional increases in the second year of school desegregation. Johnson (2011) found that within four years following a court order, the change in the dissimilarity index, a measure of racial integration, equals to 36 percent of the average index in 1970. Reber (2005) found that despite white flight, an increase of nonwhite exposure to whites range between 6.5 to 8.6 percentage points 10 years after the school desegregation took place. White students, who are often from families with higher socioeconomic status, are usually considered to have positive effects on their peers (Coleman et al., 1966). The importance of peer effects on academic and economic outcomes has been widely empirically documented. (See Sacerdote et al., 2011 for a review.) In schools, peer effects can occur through in-class competition and emulation. Students' peers can also matter contextually by attracting better teachers and changing the expectations of teachers, students, and families (Coleman et al., 1966).

Second, school desegregation increased the funding for black students. Before desegregation, states redistributed funding from traditionally black schools to white schools. Thus, there was a pre-existing black-white gap in per-pupil funding within school districts. To ensure the resources available to white students were not negatively affected by school desegregation, the state infused funding to "level up" the funding to the levels previously experienced only in white schools (Johnson, 2011; Reber, 2010). Johnson (2011) found that school desegregation increased per-pupil funding by one third (nearly 1000 dollar per-pupil) for black students.

Reber (2010) and Johnson (2011) found that districts with higher shares of blacks at the onset of school desegregation experienced smaller increases in exposure to whites and larger increases in resources. The negative relationship between black enrollment share and white exposure is mechanical: Even if the school district is integrated, if the initial enrollment share of blacks is high, the exposure to white students would be low. The positive relationship between black enrollment share and increases in funding exists because the pre-existing white-black differential in per-pupil funding was larger in school districts with high levels of black enrollment. Thus, states needed to provide greater funding to compensate for a larger white-black gap in per-pupil expenditure.

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