



# Kindergarten for all: Long run effects of a universal intervention<sup>☆</sup>



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## ABSTRACT

Theory and evidence point towards particularly positive effects of high-quality child care for disadvantaged children. At the same time, disadvantaged families often sort out of existing programs. To counter differences in learning outcomes between children from different socioeconomic backgrounds, governments are pushing for universal child care. However, it is unclear how effective programs with universal participation may be at addressing the needs of disadvantaged children. We provide evidence on the long-run effect on schooling of mandating kindergarten at age 5–6. Our identifying variation comes from a reform that lowered school starting-age from 7 to 6 in Norway in 1997. The new program was designed as a low intensity kindergarten program, similar to voluntary child care programs available before mandating. Our precise DD estimates reveal hardly any effect, both overall, across subsamples, and over the grading distribution. A battery of specification checks support our empirical strategy.

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## 1. Introduction

Universally available child care of high quality can benefit child development, also in the long run (Almond & Currie, 2010). Returns are often found to be particularly

high for children from disadvantaged families.<sup>1</sup> At the same time, children from disadvantaged families are underrepresented in existing programs. This sorting into the programs coupled with particularly large estimated benefits among disadvantaged children, suggests a potentially strong social gradient in expanding or mandating early childhood interventions (Barnett & Belfield, 2006). Indeed, in an effort to counter differences at school entry depending on social background, many countries are currently

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<sup>1</sup> Havnes and Mogstad (2012) document large heterogeneity in the effects on adult outcomes from child care for 3–6 year old children in the late 1970s in Norway. Ludwig and Miller (2007) interpret the effects of the US Head Start as an upper bound because children are among the most disadvantaged. Further, effects found in the targeted Perry Preschool project (e.g. Karoly, Kilburn, & Cannon, 2005) are larger than what could plausibly be expected in the general population.

moving towards subsidized child care available for the general population.<sup>2</sup>

Policies and proposals promoting universal interventions in early childhood pose a challenge to the existing literature, which has reserved most of its attention for programs targeted at disadvantaged children. Existing studies on universally available programs typically reveal the impact on children from families with a strong preference for out-of-home care. For instance, [Baker, Gruber, and Milligan \(2008\)](#) and [Havnes and Mogstad \(2011\)](#) study the introduction of a universally available program but with actual enrollment being far from universal, while [Gupta and Simonsen \(2010\)](#) explicitly exploit rationing of child care for identification. Since both theory and evidence point towards important heterogeneity in the effects of early childhood interventions, it remains an open question how well the current evidence can inform about the impact of truly universal interventions. In particular, it is unclear how effective programs with universal participation may be at addressing the needs of disadvantaged children.

In the current paper, we provide evidence on the long-run effect on schooling of a reform that mandated kindergarten at age 5–6. We first consider the impact on children's school performance at the end of compulsory schooling at age 15–16. We also consider the impact on high school dropout and on enrollment in the academic track in upper secondary school measured at age 18 and 16, respectively. These are interesting outcomes in their own right, and help confront the concern of fading out of cognitive effects from early intervention programs, even when long-term effects on substantive outcomes may persist.<sup>3</sup> Our identifying variation comes from a 1997-reform in Norway that lowered school starting age from seven to six. The new program for six year olds was designed as a low intensity kindergarten program, aimed at preparing children for school by learning through play, similar to early US kindergarten programs ([Cascio, 2009](#)). The goal of the new program was to counter differences in learning outcomes between children from different socioeconomic backgrounds. While disadvantaged children were thought to benefit most from kindergarten programs, they were strongly underrepresented in the existing voluntary programs prior to the reform.

Because the implementation of the reform was nationwide, the most direct assessment compares cohorts just young enough to be affected with cohorts just old enough not to be affected. An immediate objection to this strategy is that we may be confounding effects of the policy with unrelated cohort effects. To get around this issue, we take advantage of voluntary enrollment in child care prior to the reform. Since the new program for six year olds bears strong resemblance to kindergarten programs that

were widely available prior to the reform, it should have little impact on children that would voluntarily enroll in such programs. This motivates a difference-in-differences (DD) approach where we compare outcomes before and after the implementation of the mandatory kindergarten reform, of children who enroll in voluntary kindergarten at age six (i.e. the control group) and children who do not enroll in voluntary kindergarten at age six (i.e. the treatment group). Because voluntary enrollment at age six is unobserved by definition after the reform, we use enrollment in child care at age five to determine treatment. This should be a good proxy since children who are enrolled at age five are almost universally enrolled at age six.

Results reveal that the program had little impact on affected children. In our baseline estimation, the precisely estimated effect on the child's school performance is negative but below 2% of a standard deviation. Meanwhile, we find a modest increase in high school dropout rates, and no impact on academic tracking in upper secondary school. These results are robust to including or excluding a large set of observable characteristics, as well as a battery of specification checks confronting the key identifying assumption of common trends in treatment and comparison groups. Unfortunately, our data are limited to a few years before the reform, and a cash-for-care reform limits the usable observations after the reform. However, we find no evidence of a separate effect of the reform on our comparison group that may attenuate effects on the treatment group, nor of a delayed effect of the reform on later cohorts. We also find no evidence of important heterogeneity, when we look across subsamples reflecting the child's background and home environment, across different segments of the grading distribution, or across school subjects where we may expect children to benefit from different types of skills.

To help interpret our estimates, we take a close look at the contents of the program, which was specifically intended to be play-oriented, with little focus on specific learning activities. As a comparison, the program appears to be quite similar in content to the early US kindergarten programs, as its focus was more on children's social development than on academic training, though the compulsory nature of the Norwegian program is an important difference.<sup>4</sup> The program also seems comparable to the US Head Start program, with its low intensity educational content, as well as similar costs and contents.<sup>5</sup> While the program we study served the entire population of 5–6 year olds, however, Head Start serves children 3–5 years old and is targeted at poor families.

Our paper contributes to the rapidly increasing literature on how early childhood interventions in general, and kindergarten programs in particular, can promote the formation of skills in children.<sup>6</sup> This literature is divided in

<sup>2</sup> For instance, US President Obama stated in his 2013 State of the Union Address that he wants to "make high-quality preschool available to every child in America". In Europe, the European Union Commission proclaims that early childhood education and care "is the essential foundation for successful lifelong learning, social integration, personal development and later employability" ([European Commission, 2011](#), p. 1).

<sup>3</sup> See for example [Heckman, Moon, Pinto, Savelyev, and Yavitz \(2010\)](#) or [Heckman, Pinto, and Savelyev \(2013\)](#).

<sup>4</sup> See [Cascio \(2009\)](#) for details and discussion on development of the US kindergarten program, and [Norwegian Ministry of Education \(2010\)](#) on the Norwegian program.

<sup>5</sup> See [Deming \(2009\)](#) for details and discussion on Head Start.

<sup>6</sup> For recent reviews, see [Almond and Currie \(2010\)](#), [Ruhm and Waldfogel \(2012\)](#), or [Baker \(2011\)](#). Our paper also relates to the literature on early enrollment into formal schooling (see e.g.

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