



# Increasing educational attainment in Egypt: The impact of early childhood care and education <sup>☆</sup>



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## ABSTRACT

This paper investigates the impact of early childhood care and education on subsequent educational attainment in Egypt. Comparisons between siblings are used to control for selection and duration analysis methods are used to account for the presence of current students in the data. These methods are compared to OLS to demonstrate the importance of accounting for both observed and unobserved heterogeneity and for students who have not yet completed their schooling. Early childhood care and education significantly reduces the probability of dropping out, specifically during basic education. The change in educational attainment from early childhood care and education is approximately one additional year of schooling. Key pathways for this effect include improved school performance, such as increases in test scores and decreases in repetition, during basic education. Results indicate expanding early childhood care and education would be an important and effective policy for improving educational outcomes.

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## 1. Introduction

The Egyptian government is making a major investment in early childhood education through an expansion in access to kindergarten. Providing kindergarten to only 30% of Egyptian children by 2015 is estimated to cost the country \$103 million (UNDP & Institute of National Planning, 2008). There is a body of supportive international evidence indicating that kindergarten, as a form of early childhood education, is a worthwhile investment. Early childhood care and education can have a positive impact on human development in both the short and long run. While early educational interventions *can* have important effects, there is also a great

deal of heterogeneity in program impacts (Nores & Barnett, 2010). The quality of early childhood interventions and the country-specific context in which they are applied can cause enormous variation in program effects.

In the context of Egypt and the Middle East and North Africa (MENA) region, there is a shortage of evidence on the impact of early childhood care and education (ECCE) (Janssens, Van Der Gaag, & Tananka, 2001; Todd, 2010). Current estimates of the impact of ECCE in Egypt are merely simulations (Janssens et al., 2001; van Ravens & Aggio, 2008) on the basis of evidence from places such as Chicago, India, and Bolivia. ECCE is under-researched throughout the MENA region; a recent meta-analysis examining the high-quality evidence on early childhood development used 56 different studies from 23 countries throughout the world, none of which came from the MENA region (Nores & Barnett, 2010). Engle et al.'s (2011) review of the evidence on preschools likewise includes no countries from the MENA region. As well as being under-researched, early childhood is under-resourced in the region. Despite the fact that the region is middle-income, pre-primary enrollments in the MENA

<sup>☆</sup> Some preliminary findings of this paper were included in a short policy brief, "Is Early Childhood Care and Education a Good Investment for Egypt? Estimates of Educational Impacts, Costs, and Benefits" (English and Arabic). 2012. *Survey of Young People in Egypt Policy Brief No. 3*. New York, NY: The Population Council.

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region more closely resemble those of Sub-Saharan Africa than other middle-income countries (UNESCO, 2010). This paper contributes important evidence on the under-researched issue of ECCE in MENA by estimating the impact of ECCE on educational outcomes in Egypt.

Early childhood is an important focus of human development interventions and policies because it is when persistent development gaps and deficits occur, and also when interventions to rectify disadvantage yield benefits that justify their costs (Heckman, 2006). The plasticity of children's brains (Shonkoff & Phillips, 2000) and the challenges of reversing early deficits make early childhood a vital window for interventions (Naudeau, Kataoka, Valerio, Neuman, & Elder, 2011). Childcare, education, nutrition, healthcare, and cash transfer programs are the primary types of early childhood interventions and show a broad variety of health, cognitive, behavioral, and educational impacts (Aboud, 2006; Baqui et al., 2009; Berlinski, Galiani, & Gertler, 2009; Bernal & Fernández, 2013; Bhutta et al., 2008; Black et al., 2008; Eickmann et al., 2003; Engle et al., 2011; Naudeau et al., 2011; Nores & Barnett, 2010; Temple & Reynolds, 2007; Walker et al., 2011). Which intervention or combination of interventions is the best investment remains a subject of discussion and analysis (Engle et al., 2011; Nores & Barnett, 2010).

A great deal of the debate focuses on studies from the United States, where evidence shows the potentially large impacts of ECCE. Camilli, Vargas, Ryan, and Barnett (2010) synthesize 123 studies and demonstrate that preschool programs have significant effects on children's cognition, social skills, and school progress. The Abecedarian Project, the Chicago Child Parent Center Program, and the Perry Preschool Program in particular provide impressive results and the best-studied evidence (Heckman, Moon, Pinto, Savellyev, & Yavitz, 2010; Temple & Reynolds, 2007; Vegas & Santibanez, 2010). These programs show positive economic returns to quality preschool, with benefit/cost ratios in the 4–10 range, higher than most other alternative education interventions (Temple & Reynolds, 2007).

Evidence from the United States showing the impact of preschool has been reinforced by international evidence. ECCE programs in East Africa (Mwaura, Sylva, & Malmberg, 2008) and Colombia (Bernal & Fernández, 2013) and preschool programs in Uruguay (Berlinski et al., 2009; Berlinski, Galiani, & Manacorda, 2008), Bolivia (Behrman, Cheng, & Todd, 2004) and Bangladesh (Aboud, 2006) show the potential of ECCE to improve cognitive, non-cognitive, and educational outcomes. Because of its powerful impact, early childhood education is considered a cornerstone of meeting the goal of Education for All and the Millennium Development Goals, as well as an important element of development and poverty reduction strategies (UNESCO, 2006).

However, not all ECCE programs are equal. Negative, insignificant, and small impacts, as well as positive, significant, and large impacts are visible in the literature (Engle et al., 2011; Nores & Barnett, 2010; Walker et al., 2011). Much of the evidence showing a large impact for ECCE comes from high quality programs (Temple & Reynolds, 2007; Vegas & Santibanez, 2010). In Bangladesh, a revised higher quality preschool program was found to be a significant improvement over existing preschool on a number of cognitive and social outcomes (Moore, Akhter, & Aboud, 2008). Evidence

also suggests that disadvantaged children may particularly benefit from ECCE programs (Heckman, 2006), but this evidence is not conclusive (Nores & Barnett, 2010).

The focus of this study on long-run educational attainment and the pathways through which ECCE affects attainment is a particularly valuable addition to the literature on ECCE. Studies on the short term effects of early childhood interventions are much more common (Nores & Barnett, 2010), but short term effects may dissipate, particularly in terms of academic or cognitive gains or for particular sub-groups (Currie & Thomas, 1995; Magnuson, Ruhm, & Waldfogel, 2007). Truly long term studies from the developing world are rare. Two of the longer-term studies include Berlinski et al. (2009), which quantifies the cognitive effects of preschool at third grade in Uruguay, and Berlinski et al. (2008), which examines preschool's effect on 7–15 year-olds' educational attainment in Uruguay. This effect, as they point out, is not necessarily predictive of final attainment. Hazarika and Viren (2013) similarly examine the effect of participation in early childhood development programs on 7–18 year-olds' school enrollment in rural North India, and find significant and substantial increases in enrollment, but do not calculate the programs' impact on educational attainment.

Selection into ECCE is a challenge in estimating the causal effect of ECCE, since ECCE is likely to be correlated with a host of observable and unobservable characteristics. This study identifies the effects of ECCE through within-family estimates. This approach to controlling for selection has been used in a number of other studies of ECCE (Berlinski et al., 2008; Currie & Thomas, 1995) and is recognized as an effective approach to generating causal estimates for education data (Card, 1999). The data set used to estimate the impact of ECCE is Egypt's first representative survey of young people to include a question about ECCE attendance. The data cover a sample of youth who would have been of preschool age in 1984–2004. Appropriate econometric techniques, such as estimating the impact of ECCE within-family, can generate ECCE effects from this cross-sectional data.

The results show that early childhood care and education has an impact on educational attainment that is both statistically significant and sizeable. ECCE increases educational attainment by approximately one year, with this effect primarily due to decreased primary and preparatory drop out. A key pathway for ECCE's impact on educational attainment is improved school performance, such as higher test scores, decreased grade repetition, and improvements in school tracking, during the early years. Investments in ECCE can be a powerful approach to improving educational outcomes, and the international research suggests that increases in ECCE are likely to have other beneficial effects on human development as well.

The paper proceeds as follows. Section 2 discusses the data. Section 3 provides background on Egypt and its educational system. Section 4 describes the empirical strategy. Section 5 presents the findings on educational attainment. Section 6 examines the pathways that may drive ECCE's impact on attainment. Section 7 discusses a number of checks for selection into ECCE. Section 8 concludes with the implications of the findings, their limitations, and suggests directions for future research.

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