



The role of early childhood settings for 4–5 year old children in early academic skills and later achievement in Australia



Amy Claessens^a, Rachel Garrett^{b,*}

^a University of Chicago, United States

^b American Institutes for Research, 20 North Wacker Drive, Suite 1231, Chicago, IL 60606-2901, United States

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ABSTRACT

Formal early childhood education programs have been shown to promote the early academic skills of young children. However, the academic benefits acquired through program attendance fade quickly in the early elementary school years. Using a nationally representative sample of Australian children, we describe the programmatic and teacher differences between different types of formal early childhood programs for children between 4 and 5 years old—pre-year 1, school-based preschool, standalone preschool, and center-based child care. We examine the child and family background characteristics that are correlated with selection into different settings and how these settings are associated with children's early academic skills and on their subsequent achievement. We focus on understanding if there are differential academic benefits accrued from each program type and whether or not these benefits persist into the early elementary school years. Results indicate that maternal employment and economic disadvantage are correlated with program participation and that pre-year 1 and preschool teachers have higher qualifications. Results also show that children who attended a pre-year 1 program held an initial, significant advantage in early academic skills compared to children enrolled in center child care. Center child care was associated with higher early math skills than preschools. Children who did not attend any early childhood programming lagged behind their peers in school readiness skills. By middle childhood, all the early skill advantages had disappeared, showing rapid fadeout of academic benefits acquired from these specific types of early childhood programs. Implications for policy and practice are discussed.

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Introduction

Preparing children for success in both school and later life is an important focus of parents, policy makers, and researchers alike. As evidence, primarily from the United States and United Kingdom, has shown both the short- and long-term benefits of formal early childhood education programs (Barnett & Masse, 2007; Gormley, Gayer, Phillips, & Dawson, 2005; Heckman, 2006; Magnuson, Meyers, Ruhm, & Waldfogel, 2004; Melhuish, Phan, et al., 2008; Melhuish, Sylva, et al., 2008; Schweinhart, 2006; Temple & Reynolds, 2007), many countries have made investing in early childhood education for children five years old and younger a priority. Programs focused on improving early academic skills are policy priorities of many Organisation for Economic Co-Operation and Development (OECD) countries (OECD, 2010, 2011). Across the world, nations have turned their focus toward improving children's

short-run success in school and long-run economic success through investments in early childhood.

Australia is no exception to this trend. Although historically, Australia has provided fairly strong support for child care, expanding the early childhood education system has been given much attention from policy makers and the public. Yet, there is limited research using Australian samples focused on any differential benefits by program type and the persistence of any academic benefits from attending different early childhood programs. Early childhood education and care for 4–5 year olds in Australia is a mix of programs including pre-year 1, school-based preschool, standalone preschool, and center-based child care. The existing international literature is mixed as to which program types produce the largest academic benefits and if these benefits persist (Barnett, 2011). Thus, a more thorough understanding of programmatic differences, who selects into settings, and how participation in the various types of early childhood programs by young children relates to their initial and later achievement in the Australian context is warranted. Using a nationally representative sample of Australian children, the present study aims to address this gap in the extant literature by examining different types of early

* Corresponding author at: University of Chicago, 5736 South Woodlawn, Chicago, IL 60637, United States. Tel.: +1 312 288 7600.

E-mail address: rgarrett@air.org (R. Garrett).

childhood education and care among Australian children. In our investigation, we report early childhood program use among 4–5 year old children across Australia, and we provide a description of the basic program characteristics. We examine selection into different program types illuminating any differences in program attendance by child and family background characteristics. We then examine how attending different types of early childhood education and care is associated with initial skill levels as well as later achievement, paying careful attention to the persistence of any initial academic benefits accrued. Through this investigation, we provide a systematic examination of the selection into different early childhood education programs, how different programs relate to children's early academic skills, and whether or not any benefits accrued by 4–5 year old children persist into middle childhood in Australia.

Children's experiences in early childhood, typically the period from birth to age 5, are important for the development of their early academic skills and for their later life outcomes. Transactional and bioecological developmental theories posit that development and developmental trajectories are the product of the complex interaction of the child with multiple settings (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998; Sameroff, 1994). The importance of out-of-home contexts such as preschool, pre-year 1/kindergarten, and child care during early childhood in influencing child development has received much attention from researchers in the United States and abroad. Across these contexts, formal early childhood programs have been linked to higher early achievement test scores compared to informal care or no care (Burchinal, Peisner-Feinberg, Bryant, & Clifford, 2000; Burger, 2010; Camilli, Vargas, Ryan, & Barnett, 2010; Cannon, Jackowitz, & Painter, 2006; Harrison, Ungerer, Smith, Zubrick, & Wise, 2009; Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007; Magnuson et al., 2004; Smart, Sanson, Baxter, Edwards, & Hayes, 2008; Votruba-Dzal, Li-Grinning, & Maldonado-Carreno, 2008). Yet, less attention has been paid to specific program types, particularly in the international literature with much of the evidence coming from samples of American children.

While formal early childhood programming has been found to promote children's early academic skills, differences between program types do exist and merit consideration. Formal early childhood programs vary in many ways such as hours, staff qualifications, and location. Typically occurring center-based child care, although formal in nature, has some basic differences from preschool and pre-year 1/kindergarten programs. Center-based child care is typically full-day, year-round in order to support parental work and generally serves a broader range of children, providing more varied services compared to preschools or pre-year 1/kindergarten (Pianta, Barnett, Burchinal, & Thornburg, 2009). Center-based care providers typically have lower levels of education and qualifications than those teachers in preschool settings, particularly public school-based preschool (Barnett, 2004; Harrison et al., 2009; Pianta et al., 2009). This is likely due to school-based regulations requiring teachers to have higher levels of education. Similarly, kindergarten, or pre-year 1, is based in schools, although not always mandatory in both the United States and abroad; as such, kindergarten, or pre-year 1, is a school-day, school-year program. Finally, preschool programs in schools or outside of schools are typically part-day, part-year programs, rather than the full-day, full-year availability of center-based child care, although there is variation (Dowling & O'Malley, 2009; Harrison & Ungerer, 2005; Pianta et al., 2009; Robin, Frede, & Barnett, 2006).

American early childhood education and care

A large body of literature on American early childhood education and care has found that kindergarten and formal preschool

or center-based child care prior to school entry, compared to no care and home-based care, are linked to better academic outcomes (Burger, 2010; Caughy, DiPietro, & Strobino, 1994; Karoly, Kilburn, & Cannon, 2005; Magnuson et al., 2004; NICHD ECCRN, 2000, 2002, 2004). Education-based preschool programs have been linked to better cognitive and academic performance (Burger, 2010; Camilli et al., 2010; Gorey, 2001) than more typically occurring center child care or no care, particularly for low-income children (Magnuson et al., 2004). However, most commonly comparisons are made among children who attended formal programs and those who did not, with less understanding of how different types of formal settings compare to each other.

In terms of the associations between different program types of children's academic skills, several studies using samples of American children have compared standalone preschools, school-based preschools, and center-based child care. Using a nationally representative sample of American children, two studies have found slightly larger associations between attending either type of preschool and children's early mathematics and reading skills compared with center-based child care (Magnuson et al., 2004; Magnuson, Ruhm, & Waldfogel, 2007). Among disadvantaged children, school-based preschool had the largest associations with early academic skills relative to standalone preschool or center-based child care. In the United States, kindergarten attendance, particularly full-day programming, is associated with higher levels of math and reading achievement at the end of kindergarten (Cannon et al., 2006; DeCicca, 2007; Lee, Burkam, Honigman, & Meisels, 2006; Winter & Klein, 1970), although these studies rarely compared kindergarten attendance to other early childhood programming.

International early childhood education and care

International evidence on early childhood education and care, including public preschool, targeted interventions, and kindergarten/pre-year 1, generally shows positive associations with children's academic skills (Broberg, Wessels, Lamb, & Hwang, 1997; Burger, 2010; Camilli et al., 2010; Harrison et al., 2009; Nores & Barnett, 2010; Smart et al., 2008). The OECD (2011) examined literacy skills at age 15 and preschool participation rates in 65 countries, finding a correlation between the two. Recent evidence from the United Kingdom also finds strong associations between preschool attendance and children's early academic skills (Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2004) compared to less formal settings or no care. In the United Kingdom, small academic benefits in literacy and larger gains in math persisted until age 11. Taken together, this research base is largely similar to evidence from the United States about the benefits of early childhood education. However, the persistence of preschool benefits found in the United Kingdom until age 11 are in stark contrast to much of the American literature which shows fadeout as early as the spring of kindergarten (Barnett, 1995; *Preschool Curriculum Evaluation Research Consortium*, 2008; Turner & Ritter, 2004). However, none of these studies compared different types of early childhood programs to examine potential differential benefits from different programs. Leaving open the question of whether or not there are differential benefits of different types of early childhood programming.

Australian early childhood education and care

Unlike the United States, there are few studies of the associations between typically occurring Australian early childhood education and child academic skill development. There are four basic, non-compulsory, early childhood education programs for 4- to 5-year-old children in Australia: pre-year 1 (school-based),

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