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Does early schooling narrow outcome gaps for advantaged and disadvantaged children? ☆

Agne Suziedelyte [a], Anna Zhu [b,*]

[a] Monash University, Centre for Health Economics, Australia
[b] University of Melbourne, Melbourne Institute of Applied Economic and Social Research, Australia

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ABSTRACT

This paper explores how starting school at a younger age affects the developmental score gaps between relatively advantaged and disadvantaged children. While previous findings suggest that delaying school entry may improve school readiness, less is known about whether it has differential effects for advantaged and disadvantaged children. For disadvantaged children, starting school early may be a better alternative to staying at home for longer as school provides a more stable and educational environment than the family home, overcompensating for the penalties of starting school early. This may be less applicable to relatively advantaged children who generally have greater access to resources in the home and who are more likely to utilise formal pre-school services. We use the Longitudinal Study of Australian Children to investigate if there is support for this hypothesis. The endogeneity of school starting age is addressed using the regression discontinuity design. We find that an early school start generally improves children's cognitive skills, which is even more pronounced for disadvantaged children. In contrast, an early school start tends to negatively affect children's non-cognitive skills with both advantaged and disadvantaged children affected in similar ways. Thus, our findings suggest that an earlier school entry may narrow the gaps in cognitive skills, whereas the gaps in non-cognitive skills are not affected by the school starting age.

1. Introduction

Disadvantaged children begin school academically and behaviourally behind their relatively advantaged peers. They lag behind during the school years, and in adulthood they face weaker economic, social and health outcomes. Since children's scores in cognitive and non-cognitive tests are correlated with better outcomes later in life (Cunha & Heckman, 2007), understanding the origins and persistence of these early gaps is a vital step towards reducing later gaps and ensuring the prosperity of future generations. In particular, we care about identifying the factors that can reduce these inequalities and that can be modified by policy.

One example of how the state attempts to modify these inequalities is by providing free schooling to children. However, some researchers argue that the inequalities of opportunity are perpetuated, even accelerated, during the schooling years by the increasing divide between private and public schooling (Preston, 2011). Children who attend private schools, compared to those who attend public schools, may have greater access to resources within the school, which can better aid their teachers in delivering the course curriculum and create a more enriching environment for children to learn. Children who attend private schools may also have fewer encounters

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* Corresponding author. Tel.: +61 3 8344 2647.
E-mail address: anna.zhu@gmail.com, anna.zhu@unimelb.edu.au (A. Zhu).

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with children with extreme behavioural problems compared to children who attend public schools.

However, while inequalities exist in our schooling system, how do these inequalities compare to those that exist in the family home context? For example, does the size of the social gradient in achievement scores from attending school earlier narrow compared to the alternative of staying at home for an additional year? And does this apply differently for children from non-English speaking compared to English speaking families, according to the parent's level of education, family structure or the degree that parents involve themselves in different aspects of a child's life? It is important to consider these other dimensions of disadvantage, as opposed to just the conventional measure of income, because heterogeneity in the experiences of disadvantage within low-income families can produce variation in the benefits of early or additional schooling for these children.

These questions are relevant to the policy debate over whether children should delay their age of school start. Starting school early compared to staying at home for longer can impact on children's skill development patterns differently for advantaged and disadvantaged children. A priori, for disadvantaged children, we expect schools to provide greater access to resources and an environment that is more conducive to learning compared to the home environment. Whereas for advantaged children, the relative benefits of going to school to staying at home may be offset (or at least be lower) because their parents tend to invest more time and resources into their children's early education, even before they enter primary school. In this case, we would see lower socioeconomic status related achievement score gaps for children who start school earlier relative to children who start school later. Alternatively, if the inequality in the school environment is greater than the inequality in the home environment, then we will see disadvantaged children lose more ground in achievement scores to advantaged children in the group who start school earlier compared to later.

Most states in Australia admit children into school at the start of the calendar year, with children admitted if they turn five by a specified date. This cut-off rule means that children whose birthdates are one day apart, but lie on either side of the cut-off date, can begin school (nearly) one year apart. We use the interaction between the date-of-birth and the school eligibility rules to identify the causal effect of an early school start. Our approach follows the economics of education literature looking at the impacts of delayed entry into primary school. This is an effective identification strategy if children's dates of birth are random near the school eligibility cut-off dates – as they have been shown to be in the literature (Dickert-Conlin & Elder, 2010). This paper contributes to the literature by comparing the net benefits of starting school early for children from disadvantaged and advantaged backgrounds. In other words, we specifically answer the question of how the gaps in cognitive and non-cognitive scores between advantaged and disadvantaged children change depending on whether or not they started school early. As another contribution to the literature, we explore how the results change when we consider different ways of defining disadvantage. We focus on measures such as the parent's education, relationship status, linguistic background as well as the level of educational resources in the home and parental participation in the child's life.

2. Literature review

The literature on the effects of school starting age (SSA) on human capital accumulation is quite large. As in our study, most of the papers in this literature use school starting age rules to separate the causal effect of SSA from the confounding variables.

A number of papers, spanning different countries, analyse the effect of SSA on children's academic performance, usually measured by test scores. For example, Datar (2006), Cascio and Schanzenbach (2007), Elder and Lubotsky (2009), Smith (2009), and Aliprantis (2014) provide evidence for the U.S.; Smith (2009) for Canada; McEwan and Shapiro (2008) for Chile; Crawford, Dearden, and Meghir (2007, 2010) and Crawford, Dearden, and Greaves (2011, 2013a, 2013b) for the U.K.; Strom (2004) for Norway; Fertig and Kluve (2005), Puhani and Weber (2007), Mühlenweg and Puhani (2010), Mühlenweg, Blomeyer, Stichnoth, and Laucht (2012), and Wolff (2012) for Germany; Ponzo and Scoppa (2011) and Pellizzari and Billari (2012) for Italy, and Hamori and Kollo (2011) for Hungary. Bedard and Dhuey (2006) provide cross-country evidence. Most of these papers find that starting school at an older age improves academic performance, except Cascio and Schanzenbach (2007) and Pellizzari and Billari (2012) who find that being younger in the class has positive effects on academic outcomes (the latter paper focuses on university students).

In most of the cited papers, the effect of SSA is confounded with the effect of age at test or length of schooling, because these three variables are perfectly collinear: age at test = SSA + length of schooling. In addition, all these variables are highly correlated with relative age within a class. A series of papers by Crawford and colleagues (2007, 2010, 2011, 2013a, 2013b) aim to disentangle these effects by using regional variation in SSA rules, multiple datasets, and econometric techniques. Their results show that age at test accounts for most of the positive effect of SSA. Relative age and length of schooling also have positive effects, but the actual effect of age at which a child starts school is practically zero. Elder and Lubotsky (2009) also find similar results. On the other hand, Datar (2006) finds that starting school later has a positive effect on test scores even after eliminating the age at test effect. The latter findings are, however, based on quite strong functional form assumptions.

Other papers investigate whether SSA has any long-term effects. The results are mixed. Entering school later is usually found to positively affect educational attainment, but the effect on earnings is either zero or slightly negative. Fredriksson and Öckert (2006, 2013), Crawford et al. (2010), Solli (2012), and Zweimuller (2012) show that delaying school entry positively affects level of education. On the other hand, Fleury (2011) and Lincove and Painter (2006) find no effect of SSA on schooling. Although there is some evidence of negative effect of SSA on earnings (Bedard & Dhuey, 2012; Solli, 2012), most papers (Crawford, Dearden, & Greaves, 2013c; Dobkin & Ferreira, 2010; Fredriksson & Öckert, 2006, 2013; Lincove & Painter, 2006) find that SSA does not affect earnings. Zweimuller (2012) shows that there is a positive