Policy Forum: Public Investment in Disadvantaged Children

Social Disadvantage and Education

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Abstract

‘Social disadvantage’ has many dimensions studied in various ways in the economics of education. Studies focus on its measurement, the characteristics of those experiencing it, its consequences and interventions to remedy some of its effects. Those likely to experience persistent disadvantage include lone parents, Indigenous Australians, people with disabilities and people with low educational attainment. It is children from these families whose educational progress we should closely monitor. Interventions can improve outcomes of disadvantaged children, but such programs need to be evaluated more rigorously in the future, and their evaluations released publicly to provide sound basis for future policy.

1. Different Perspectives on Disadvantage in Education

‘Disadvantage’ has many dimensions that are studied in a variety of ways in research on the economics of education. Studies of disadvantage have quite different emphases. They might focus on identification of the characteristics of those who experience disadvantage in education, or on a description of how to measure disadvantage in education, for example, how best to define socio-economic status (SES) for analysis in education (for example, Homel et al. 2012; Ainley et al. 1995), or they might focus on the educational consequences of disadvantage, in terms of low achievement and/or attainment and greater experience of failure (Haveman and Wolfe 1995; Machin 2006; Currie and Almond 2011). Studies might look to distinguish permanent, persistent or cumulative disadvantage from a single, or more temporary or transient, experience of it (Kallio, Kauppinen and Erola 2016). More challengingly, studies might focus on the underlying causes of disadvantage, and phenomena that might operate to exacerbate its impact and/or the remedies, policies and programs that might act to eliminate or mitigate its effects (Heckman 2006; Bjorkland and Salvanes 2011).

An important topic for education is the extent to which educational institutions—the design of school certificates (Hanushek and Woessman 2011), the operation of enforced school enrolment boundaries (Black and Machin 2011), assessment formulas (Teese and Polesel 2003), the operation of funding arrangements (Gonski 2012), reforms that replace highly variable home learning environments with less variable public learning (Raudenbush and Eschmann 2015), or system-wide examination practices and policies that extend the period over which education is acquired (Hanushek and Woessman 2011; Raudenbush and Eschmann 2015), for example, might themselves act on disadvantage in education, sometimes in unanticipated ways.

All of these are important dimensions of disadvantage and no brief review or panel of commentators can deal with the entire terrain. In this article, I aim to provide the briefest introduction to the topic of disadvantage in education. The first section contains some background information: descriptions of disadvantage in education and some associations. The second section provides a brief framework for describing studies of disadvantage in education. The third section summarises the contributions of our three workshop speakers on disadvantage in education and places their contributions within the framework described earlier. The final section concludes the article.

2. Definitions and the Extent of Disadvantage and Its Consequences in Education

After summarising four distinct but related literatures that each provide a lens with which to look at disadvantage, McLachlan, Gilfillan and Gordon (2013) conclude that ‘To capture the multi-dimensional nature of disadvantage a combination of measures and indicators may be necessary’ (p. 53).

The four dimensions of disadvantage the authors consider are the traditional relative income poverty-related approach, the deprivation approach (Saunders, Naidoo and Griffiths 2007), a human capabilities and functioning approach (Sen 2000) and the social inclusion/exclusion approach (Atkinson 1998). Further, the authors emphasise that it was necessary to measure disadvantage with longitudinal data focusing on mobility into and out of disadvantaged states, since it was not necessarily a single observation of poverty or deprivation that mattered for viewing people as disadvantaged, but the persistence with which they were observed as being disadvantaged in succeeding years that spoke most accurately of their condition.

McLachlan, Gilfillan and Gordon (2013) point to evidence that indicated a high prevalence of relative income poverty in Australia among people who were jobless (the unemployed, those not in the labour force and/or those dependent on income support), single persons and lone parents (Australian Council of Social Service 2012). Those with high rates of multiple deprivation were those on income support, Indigenous Australians, those with long-term health conditions and lone parents (Saunders, Naidoo and Griffiths 2007). Those experiencing social exclusion were the jobless, those with long-term health conditions, the low educated, lone parents, lone persons and Indigenous Australians (Brotherhood of St Laurence 2011). Lone parenthood was associated with persistent relative income poverty, which suggests a substantial number of children grow up in households experiencing long periods of relative income poverty. Deep social exclusion persistence was more common among those with a long-term health condition, the least educated, Indigenous Australians, lone parents and the unemployed.

In sum, McLachlan, Gilfillan and Gordon (2013) conclude that the ‘Groups who are most likely to experience deep and persistent disadvantage include lone parents, Indigenous Australians, people with a long-term health condition or disability and people with low educational

attainment' (p. 57). They emphasise that not everyone with these characteristics necessarily experienced disadvantage, which suggests considerable variation in resilience across the population. For many of the disadvantage measures, around 10 per cent of the population were captured by the relevant indicator in any year, with less than 5 per cent experiencing it over more than one year.

Studies in the economics of education have noted the positive intergenerational correlation in educational attainment—those remaining in education longest (shortest) among the current generation of young people are the children of those who stayed in education longest (shortest) among the preceding generation (Black, Devereux and Salvanes 2005).

Studies of educational attainment or achievement tend to find both are lower among the children of adults with low education, of lone parents, of income support recipients, of the jobless, and among those with jobs, of those whose parents work in low-skilled jobs (Hanushek and Woessman 2011; Homel et al. 2012).

Where it is available as a proxy measure of social background, studies sometimes use the number of books kept in the child's house as a (or the main) measure of social background (for example, Gustafsson, Hansen and Rosen 2013 emphasise this measure). As a catch-all, studies have used as the measure of a child's social background some combination of their parents' education levels and their employment, including whether they have a job (Homel et al. 2012). Others have used measures such as free school meal eligibility.

There are any number of costs associated with growing up with disadvantage in the education literature. For individuals themselves, these costs include that individuals from disadvantaged backgrounds: obtain less education than other children (Marks et al. 2000); obtain lower quality education where they do complete the same level of education, since their achievement levels are lower than other children (see Justman 2017, this issue); they may develop fewer desirable non-cognitive skills such as persistence or general 'character' than other children; they not only enrol less in non-compulsory or high status courses (like university), they also drop out more often (Cardak and Vecchi 2016). Then, there are costs from any activity that education has a positive impact on in terms of lost benefits—for example, on health behaviours, political attitudes, and engagement and volunteering (McMahon 2006).

3. A Framework for Understanding Disadvantage in Education Studies

There are three different forms of economic analysis in the education sphere that feature in empirical studies, and which are informative about the causes and consequences of disadvantage in education. The first is the education production function. In economics in general, the production function maps the relationship between a firm's inputs and output, with parameters that reflect how inputs are combined and transformed into the relevant output. The education production function shows the same type of relationship, and reflects how family, school and individual characteristics—the 'inputs'—are transformed into an education output, generally a measure or an individual's cognitive skills (see Todd and Wolpin 2003).

The second type of analysis often undertaken in education that is useful for looking at disadvantage is the choice or decision framework used by economists to analyse the particular level of education individuals attain. Like many decision rules in economics, individuals undertake an action up to the point where any additional benefits they gain from any more of the action are outweighed by the additional costs (see Meghir and Rivkin 2011). The focus of this type of analysis is on educational attainment, often in the form of studying who commences and/or completes some specified level of education, such as the completion of high school, or commences study at university.

The third type of analysis focuses directly on one arm of the previous issue. Its focus is on understanding the ‘benefit’ function, which relates the amount of some outcome obtained by individuals to their education choices, along with other observed characteristics. Most commonly, the outcome studied is some form of labour market remuneration, such that the function is described as an ‘earnings function’ (see Heckman, Lochner and Todd 2006). These studies relate the wages or earnings of individuals to their education level, other features of their completed education such as its quality or their field of completed study, the amount of labour market experience they have and other key personal background characteristics. However, other non-employment outcomes such as the general and mental health of individuals, participation in and/or appreciation of artistic pursuits, and levels of political engagement might equally be regressed on other factors to assess the role of education in explaining those phenomena as well (McMahon 2006).

Disadvantage and its relationship with education can be viewed through all three of these analytical approaches. We start first by describing the uses to which the education production function can be put.

3.1 The Production Function

The education production function is typically used to assess how specific inputs to the production process are related to an education outcome of interest, generally a measure of student cognitive skills. For example, the widely held view from the literature (Hanushek 2003) that class size does not have a substantial, positive impact on student achievement comes from the estimation of education production functions where one of the variables used to explain student achievement is the number of students in the individual’s current class (see Jepsen 2016 for a review).

In the analysis of disadvantage, candidates for variables of interest that capture specific dimensions of disadvantage include the social background of the individual, such as some measure of parental SES or the education level of the individual’s mother. In addition, more specific forms of disadvantage such as being from a single parent family, being from a particular racial background, having a long-term health condition, living in a particular type of neighbourhood—one with more households than some norm above the poverty rate—and so on could also be included to capture the impact of dimensions of disadvantage of interest.

Table 1 characterises the structure of the education production function. We denote the cognitive skills of individual i from family j at age a as TS_{ija} (later, we will replace the a subscript with a q to represent an education level—a grade of school or complete post-school

qualification). The kind of variables normally included to explain the educational achievement of an individual at any time include family characteristics, included to reflect differences in the likely resource inputs of families into their children, school characteristics, included to reflect differences in access to resource inputs associated with attendance at different individual or types of schools, differences in individual ability (or measures of earlier achievement), and measures of non-cognitive skills where they are available, such as locus of control, persistence or motivation.

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Table 1: Production Function Framework: Factors that Influence an Individual's Cognitive Skills at a Given Age, a , Denoted by TS_{ija}	
<i>Amount of:</i>	<i>Effectiveness of transformation into thinking skills of:</i>
Family resource inputs to age a , denoted by h_f	Family inputs, ϑ
School resource inputs to age a , denoted by h_s	School inputs, ψ
Initial measure of ability, denoted by μ	Ability, φ
Non-cognitive skills at age a , denoted by τ	Non-cognitive skills, δ
Other, unobserved factors at age a , denoted by ξ	

The relationship between educational achievement and these factors is generally modelled as a simple linear relationship. The education production function framework is useful in characterising where differences in the cognitive skills of individuals at a given age may have been generated. That is, it allows us to identify the sources, if not the causes of differences in the skills individual possess. Differences in skills can arise between individuals because of differences in the magnitudes of any of the inputs—family, school, ability or non-cognitive skills differ—or because for any of them, individuals differ in the extent to which these inputs have been transformed in skills. These individual differences in inputs or effectiveness might have a socio-economic dimension.

These differences may arise because the resources families can devote as inputs to the development of a child differ, or because the effectiveness with which they are used differ between families. Families may differ by SES in how much they read or talk to their children, and may read books with more complex language to read to them, or exercise their more extensive vocabularies when they talk to them. The first type of effect on cognitive skills will be apparent through children from higher SES families having greater values for the hours they are read to, while the transformation effect would be shown up with a higher value for the parameter on ‘reading to children’ for higher SES families than it is for children from low SES families.

As with family resources, the resource inputs from schools children receive may differ and the effectiveness of their use may contribute to differences between children that are associated

with disadvantage. For example, resources available to children may be different among the types of schools that high SES children attend compared to those that low SES children attend, such that average class sizes or teacher quality or access to computer technology differ on average between high and low SES children. Alternatively, it may be that low class sizes might be more beneficial for low SES children than high SES children, for example, so the parameters applicable to the two groups differ.

While it seems less likely that an individual's underlying or starting ability or their non-cognitive skills might differ so much across the SES distribution, it is well known that prior measured achievement does have a strong social dimension and that non-cognitive skill measures, such as locus of control, are also affected by individual social background.

Many studies do not possess a measure of initial student ability, but do have access to a measure of prior student achievement (Cardak and Ryan 2006). In these studies it is possible to assess whether two students from different backgrounds with the same level of prior achievement make the same progress from that same base. Typically, results indicate that they do not, with the student from the disadvantaged background making less progress (see Justman 2017, this issue).

3.2 The Schooling Level 'Choice' Framework

As already described, the second type of analysis used by economists to study education decisions that is useful for looking at disadvantage is the choice or decision framework used to analyse the particular level of education individuals complete. It can be characterised within a continuous framework that looks at years of schooling, where completed post-school qualifications are converted to equivalent years of education to undertake them, or within a discrete framework considering different levels of education, such as 'completed Year 12', or 'completed a vocational education qualification' or 'completed a university degree'. Like many decisions rules in economics, individuals undertake an action up if any additional benefits they gain from it are outweighed by the additional costs they face from undertaking it.

It can be simply characterised as: Decision rule to remain in education until at least level q

<p>Remain in education to at least level q if</p> $\begin{aligned} &\text{Additional benefit from education to level } q \text{ compared to level } q-1 \\ &\geq \\ &\text{the additional costs from staying education to level } q \text{ compared to level } q-1 \end{aligned}$
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where the additional benefit can be thought of as reflecting the increment in the individual's skills ($TS_{ijq} - TS_{ijq-1}$) times the way those skills are valued by the labour market, via the skill price p_s , mediated by how much individuals view their ability to themselves be rewarded for those skills (s^e a subjective probability), as well as how much they value the total reward (think of this as reflecting individual attitudes towards education, which can be summarised via a

parameter, λ). The benefit may also include any option value from completing a higher level of education that the current education level may make possible. See Meghir and Rivkin (2011) for a more complete description of this decision framework.

The additional costs from staying on in education include income foregone from not working (more), any tuition charges and other costs.

The focus of empirical studies that employ this type of analysis is on educational attainment, often in the form of studying who commences and/or completes some specified level of education, such as the completion of high school, or who commences and completes studies at university (Cardak and Ryan 2009; Cardak and Vecchi 2016). Studies routinely find that individuals from lower SES backgrounds are less likely to undertake higher levels of education, where SES might be measured by family income, occupationally-based SES measures, levels of parental education (mother has a degree), along with other measures of coming from a disadvantaged background, which might include having a single parent or a parent who was a recipient of welfare (Cardak and Ryan 2009).

Unfortunately, simple empirical results cannot disentangle exactly why any disadvantage measure picks up a negative impact on attainment. For example, does the negative impact of low parental SES operate through the additional costs of completing the level of education people from disadvantaged backgrounds face? If so, this might be addressed via, for example, income supplements, school resource supplementation or out of school educational enrichment programs for students from disadvantaged backgrounds. Alternatively, they might not know how the additional skills are valued in the labour market in terms of the opportunities it provides, or they might discount their own ability to reap those rewards, or they just might not value or enjoy education enough to give it the requisite value in weighing it against the costs they face. Such information gaps, misconceptions or aspirational limits would need to be addressed via other policy mechanisms, for example, through information provision and mentor and other programs designed to influence aspirations.

3.3 The Benefits of Education

As already described, the benefit function relates the outcomes from completing different levels of education, which might also be influenced by other background characteristics. Most commonly, studies of the benefit function relate the wages or earnings of individuals to their education level, along with other personal characteristics, including the amount of labour market experience individuals have and other key personal background characteristics, such as family background. Other features of the education individuals have completed, such as its quality, or specific characteristics associated with the jobs individuals hold, may also be taken into account in estimation (Borland and Coelli 2016). From the viewpoint of the framework above, these studies are mainly concerned with characterising the determinants of the skill price p_s .

In this literature, it is common to contrast the relationship between education and the outcomes individuals achieve for individuals who may differ according to some other characteristic. Do women earn the same as men with the same level of education (Kee 2006)? Do migrants earn the same as otherwise similar native-born individuals (Chiswick, Lee and Miller 2005)? Does

it depend on how long they have been living in the country, or where they undertook their education (Ferrer and Riddell 2008)? Are there differences in education returns that appear to depend on the race of an individual? One branch of this literature has focused on whether the returns to education are the same for individuals from low SES backgrounds as they are for individuals from high SES backgrounds, especially the value of a degree for individuals from different backgrounds (see, for example, Long 2010). The relevance of the last type of study for the present discussion is that individuals from disadvantaged backgrounds might fail to invest in their own futures if it is the case that they are likely to earn a lower return from it than some other groups.

4. The Workshop Presentations

We now turn to the three contributions to the policy workshop and describe how each relates to the empirical frameworks set out.

The presentation by Colm Harmon, read and interpreted by Deborah Cobb-Clark, focused on the decision-making framework through which individuals make their education choices, and the consequences of those choices, in terms of the benefits provided to individuals and to society. That is, it dealt largely with the second and third of the empirical frameworks described above. The benefits Harmon and Cobb-Clark focused on related earnings, general health and mental health to completed education. The presentation also pointed to related findings that indicate that low SES individuals overstate the costs involved with study and/or they understate the benefits education can convey, skewing the two elements of the comparison they make in determining how much education they should undertake. These ‘errors’ likely lead them to undertake too little education than would be optimal for them.

The other two presentations focused more on the education production function and the decision framework, looking at how skills development between different groups could be brought more into line and to reduce the socio-economic gradient in educational attainment by influencing the attention given to education in households.

Anne Hampshire described a particular intervention for children from disadvantaged backgrounds designed to increase the resources families have access to for educational investments in their children. The Smith Family’s *Learning for Life* program has as its foundation research that points to the efficacy of early intervention for disadvantaged children and a long-term commitment of support, associated with expectations about reciprocal family responsibility. High levels of parental (or carer) engagement in their children’s education are expected from families, in return for support that complements the children’s educational experiences at school. The program combines financial support with advice on and access to a suite of educational programs across a child’s educational ‘career’, from the early to the post-school years.

The *Learning for Life* program assists over 30,000 students annually in a defined set of locations across Australia. These students are the children of low-income, often single, parents with high rates of disability and low rates of employment. Recall that these are the set

of characteristics found in McLachlan, Gilfillan and Gordon (2013) to be most closely related to deep and persistent disadvantage in families across Australia. Extensive data are collected on program participants, including background information and outcome information. The program has an outcomes focus, with attendance, participation, learning engagement and completion outcomes measured, along with the success of later transitions. The program itself also has a learning focus to improve its own operation, with both data and experience or practice used to refine the approach followed with families.

Simon Kent spoke of the problems associated with translating good evidence into policy, particularly in relation to equity and education. In part, this was because purely ‘technical’ responses were not possible. To address the impact of equity is more difficult, because the issues are complex, definitions of the problem can be unclear, and solutions or policies implemented need to be studied and assessed.

Simon viewed equity as a ‘black elephant’, something so clearly important once evidence revealed its true effect, but still something whose effects were difficult to address and remedy. Simon presented evidence on the differences between the achievement growth of children from different social backgrounds, even within the same types of schools. This evidence suggested that differences between the growth in achievement of children from high and low SES background families were much larger in more disadvantaged schools than they were in higher-average SES schools.

5. Concluding Remarks

We know much more about the characteristics of those who experience persistent disadvantage and what many of the consequences of that experience are in the economics of education than we know about what programs and interventions work most effectively to reduce its impact, especially in Australia. This seems to reflect two factors: how readily evaluations of policies and programs are made public and, second, what counts as ‘evidence’ in Australia compared to other countries.

On the first issue, some combination of reluctance to release evaluations in conjunction with the political cycle means relatively little is known about the impact of relatively recent, substantial additional public funding innovations such as the New Schools programs and the initial tranches of the Gonski funding reforms. Hopefully, this might change with the second round of Gonski reforms.

On what counts as evidence, the website Teaching & Learning Toolkit (<http://evidenceforlearning.org.au/?>), based on a similar UK website) aims to provide information and guidance on the impact of a set of potential educational interventions on student learning. It bases estimates of the impact on student learning on those found in systemic reviews and meta-analyses, though the quality of studies included in these meta-analyses is not specified. By contrast, the What Works Clearinghouse website in the United States has clearer research design standards for the evidence it is prepared to rely on—only analyses exploiting well-designed randomised controlled trials and reliable quasi-

experimental designs are treated as producing reliable evidence. Only these study designs are viewed as providing plausible comparison groups against which to compare the outcome achieved by the intervention groups, in order to measure program impacts properly. The Education Endowment Fund, behind the UK toolkit, also has among its objectives that the majority of projects it funds in the future on education interventions should involve randomised controlled trial designs. The same sort of quality design standards should be applied in Australian studies of the impact of education programs for disadvantaged groups. Only by adopting such standards and making evaluations of interventions public will reliable approaches to helping the disadvantaged be identified.

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