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Early Years Policy

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Abstract

In this paper, we analyze the role that early years policy might play in narrowing educational attainment gaps. We begin by examining gaps in school readiness between low-, middle-, and high-income children, drawing on data from new large and nationally representative birth cohort studies in the US and UK. We find that sizable income-related gaps in school readiness are present in both countries before children enter school and then decompose these gaps to identify the factors that account for the poorer scores of low-income children. We then consider what role early years policy could play in tackling these gaps, drawing on the best available evidence to identify promising programs.

Keywords

early years; inequality; school readiness

One of the key challenges in addressing inequality of educational attainment, and promoting social mobility, is that substantial gaps in school readiness are already present at school entry (see e.g. Phillips, Crouse, and Ralph, 1998; Feinstein, 2003). The presence of these gaps even before children start school has prompted a great deal of interest in the role that early years policy might play in narrowing these gaps.

Interest in the early years has also been spurred by new research and scholarship in fields such as neuroscience, developmental psychology, and economics (Shonkoff and Phillips, 2000; Heckman and Lochner, 2000; Carneiro and Heckman, 2003). A further impetus is the availability of rigorous evidence that high-quality interventions can improve child development in the early years (see reviews in Karoly et al., 1998; Karoly, Kilburn, and Cannon, 2005). These results provide grounds for optimism that well-crafted policies could help narrow gaps in school readiness.

At the same time, however, there are clearly some limits to what early years programs can accomplish. Some portion of the differences that emerge in the early years will be due to factors that are not readily altered by policy. A further challenge is that not all early years programs are equally effective, high-quality programs are not inexpensive, and even the most promising model programs may not work as well when delivered on a large-scale. There are also thorny issues regarding the extent to which such programs are best delivered universally or targeted to disadvantaged groups.

In this paper, we use two types of evidence to analyze the role that early years policy might play in narrowing educational attainment gaps. We begin by documenting how large the gaps in school readiness are between low-, middle-, and high-income children in the US and UK, drawing on data from new large and nationally representative birth cohort studies. To briefly preview those results, we find that sizable income-related gaps in school readiness are already present in both countries before children enter school. We then carry out detailed analyses of the US cohort data to identify the factors that account for the poorer scores of low-income children. We find that a host of differences – in factors such as parenting style and the home environment, maternal and child health, early childhood care and education, maternal education, and other demographic factors – together help explain why low-income children come to school less ready to learn.

What role could early years policy play in tackling these types of differences? We consider this question in the second part of the paper. Drawing on the best available evidence -- emphasizing results from random assignment studies where available -- we discuss what policy reforms would be most effective in helping to close early gaps. To play a role in closing early gaps, policies must 1) effectively address a factor that is consequential for early gaps and 2) do more to improve the school readiness of disadvantaged children than more advantaged children. We identify a number of promising programs that have the potential to meet these criteria.

I. How large are the gaps in early childhood and what factors explain them?

We use data from two nationally representative birth cohort studies to document the magnitude of the income-related gaps in school readiness in the US and UK. For the US, we use data from the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), which gathered data on over 10,000 children born in 2001, with interviews at roughly 9 months, 2 years, and 4 years post-birth. For the UK, we use data from the Millennium Cohort Study (MCS), which collected data on over 19,000 children born in 2000 and 2001, with interviews at 9 months, 3 years, and 5 years post-birth. Both surveys over-sampled some populations of interest, but when properly weighted, the data are nationally representative of all families with newborns. Not all children remain in the sample for all waves, and in addition, some children have missing data on cognitive or behavior outcomes. [1] For the US, we are able to use a total of 8,900 children in constructing our income groups and 7,950 in analyzing cognitive and behavior outcomes[2]. For the UK, we use a total of 13,423 children in constructing our income groups and 10,476 in our analysis of cognitive and behavior outcomes.

Gaps by income quintile

We begin by dividing our samples into groups defined by family income over the course of early childhood (i.e. averaged over the three survey waves). Specifically, we divide families into income quintiles, with the first quintile defined as the families with incomes in the bottom fifth of the income distribution for all families with newborns, and so on. Descriptive statistics (not shown but available on request) indicate that the bottom quintile in each country has family incomes that place them below the country's official poverty line. In contrast, the typical family in the top quintile has income more than 4 times the poverty line in the UK and more than 6 times in the US.[3]

[1]Cases that are missing cognitive or behavior outcome data differ somewhat from the cases that have complete outcome data; in particular, they are disproportionately likely to be from racial/ethnic minority groups or immigrant groups.
[2]All reported ECLS-B frequencies are rounded to the nearest 50 in accordance with NCES requirements.
[3]The US uses an absolute poverty line, while the UK tends to use a relative threshold. Here we use an absolute line for the UK (60% of median equivalized disposable income in 1996/1997, uprated for inflation) to facilitate comparison.

How much does school readiness vary across these income groups? Figure 1 shows the income-related gaps for 4 year old children in the US in five measures of school readiness – literacy, mathematics, language, conduct problems, and attention/hyperactivity – all scored in terms of percentile scores that range from 1 to 100.[4] As is evident from the figure, there are sizable income-related gaps in all three cognitive measures. Gaps in behavioral dimensions of school readiness are much less pronounced.

Figure 2 provides information on income-related gaps in child outcomes for the UK. Although the overall income gradients in the three cognitive measures are similar to those seen in the US, some differences are worth noting. The gaps in scores between the lowest and middle quintile groups are slightly larger in the UK, while the gaps in scores between the middle and richest quintile are larger in the US. This reflects both higher scores among the middle-income group, and lower scores among the most affluent, in the UK relative to the US. Overall, comparing the top quintile to the bottom quintile, the gaps in scores are higher in the US. These differences make sense given that the income distribution in the UK is less skewed and in particular has lower median incomes in the top quintile.

However, income-related differences in behavior problems are more pronounced in the UK than in the US. This finding seems to be mainly driven by the higher behavior problem scores of the bottom income quintile in the UK. We can only speculate as to the reasons for this. Given that the UK measure comes from age 5 when many of the children have already started school (as compared to the US measure from age 4), the higher levels in the UK may reflect the emergence of larger gradients with age or adjustment difficulties low-income children have on starting school.

What factors contribute to these gaps?

To identify the factors that account for the income-related gaps in school readiness, we take advantage of the very detailed data in the US study, including direct observations of parenting style as well as measures of the home environment, maternal health and health behaviors, child health, and early childhood care and education, as well as family income and demographics.[5] Focusing on the three cognitive outcomes (since the income-related gaps in the behavioral outcomes tended to be small), we use a two-step method to decompose the income-related gaps into the share accounted for by each of these major domains. In the first step, we use a simple unconditional regression model to estimate how much each of the contributing variables varies by income quintile. In the second step, we estimate the return (or penalty) associated with each variable by regressing the cognitive score on all the contributing factors, including the demographic variables shown in Appendix Table 1, and the income quintile dummies simultaneously.[6]

To illustrate, approximately 12% of children in the lowest income quintile attended prekindergarten, compared with 15% in the middle income quintile. Children who attended pre-K scored, on average, 6.8 percentile points higher on the ECLS-B literacy assessment than children who did not attend, all else equal. The portion of the income gap in literacy between quintiles 1 and 3 attributed to differential pre-K attendance is then $(0.12–0.15) \times 6.8 \approx -2.0$ percentile points.

[4]The language, literacy and math scores are all derived using IRT methods from items selected specifically for the ECLS-B. See Waldfogel and Washbrook (2008) for further details.

[5]We focus on the US data alone in this section in order to avoid the myriad data comparability issues between the two datasets. In unpublished work we find that the major explanatory factors are quite similar across the two countries.

[6]Results of the two steps of the analysis are not shown here but are included in a more detailed companion paper (Waldfogel and Washbrook, 2008).

It is important to note that the factors we examine may be markers, rather than causes of, child outcomes. For example, children with more educated mothers may score higher on cognitive tests, but this does not tell us that increasing maternal education would necessarily cause improved test scores for children. Maternal education (and the other factors we consider) may at least in part be operating as markers for other unmeasured attributes that differ across families and that are themselves causally related to child outcomes. It is important to keep this caveat in mind when interpreting our results.

Parenting—Parenting differences between low- and higher-income families have been well-documented, and they are associated with sizable differences in cognitive development in our analyses as in prior research (see most recently Kiernan and Huerta, 2008; see also reviews by Desfarges, 2003; Brooks-Gunn and Markman, 2005). We consider two different parenting constructs: *parenting style* and the *home learning environment*.

Parenting style emerges as the single largest domain explaining the poorer cognitive performance of low-income children relative to middle-income children, accounting for 21% of the gap in literacy (2.67 points of the raw 12.68 point gap), 19% of the gap in mathematics, and 33% of the gap in language (Appendix Table 1). A particularly important factor included in the parenting style domain is maternal sensitivity and responsiveness (what is sometimes called nurturance), which is assessed in the US data by observing mothers interacting with their young children.

The *home learning environment* is the second most important set of factors in explaining income-related gaps in school readiness. This domain is related to parenting style and we therefore include it under the overall rubric of parenting. It includes parents' teaching behaviors in the home as well as their provision of learning materials and activities, including books and CDs, computer access, TV watching, library visits, and classes. Together these aspects of the home learning environment account for between 16 and 21 percent of the gap in cognitive school readiness between low-income children and their middle-income peers.

Maternal health and health-related behaviors, and child health—In common with prior research (see e.g. Currie, 2005; Kiernan and Mensah, in press), we find that income-related differences in *maternal health and health-related behaviors* – including smoking, breastfeeding, prenatal care, depression, obesity, and overall health -- play a role in explaining current gaps in school readiness. However, the amount of the gap accounted for by these factors is much smaller than for parenting style or the home learning environment. Together, these maternal health and health-related behaviors account for only 4% to 7% of the gap in cognitive outcomes between low-income and middle-income children.

Disparities in *child health* are a well-documented source of disparities in school achievement (Currie, 2005; Case and Paxson, 2006). Our analyses indicate that such disparities (in factors like birth weight, general health, injuries, asthma and other illnesses) account for about 4% of the gap in school readiness between low-income and middle-income children in the US.

Early childhood education and care—Given that the US has a largely private market in early childhood education and care, it is not surprising that large gaps in enrollment exist between lower-income and more affluent children. We consider two major domains of early childhood education and care: *Head Start* (a compensatory education program targeted to low-income children), and *all other types of child care*. Our estimates confirm prior research that finds low-income children less likely to be enrolled in school or center-based settings,

although they are more likely to be in Head Start (see e.g. Meyers, Rosenbaum, Ruhm, and Waldfogel, 2004).

Although low-income children's enrollment in Head Start is associated with a narrowing of the gaps in school readiness, this is partially offset by their lower rates of enrollment in other types of beneficial preschool. Differential enrollment in child care (other than Head Start) accounts for between 4% and 6% of the cognitive gaps between low-income and middle-income children; differential enrollment in Head Start, in contrast, is associated with a reduction in current gaps between low- and middle-income children by between 6% and 9%.

Parental education—Consistent with prior research, maternal education emerges as a moderately important factor, explaining 10 to 15% of the gaps in literacy and math readiness between low- and middle-income children in our analysis (but only 2% of the language gap). It is important to note, however, that maternal education is likely to influence directly many of the parenting and health behaviors that are included in the model. The gaps attributed here to differential maternal education, therefore, capture only the net effects of education on outcomes over and above those via the included mechanisms.

Other demographic differences—With such detailed controls in the model for what parents do and for parental education, it is perhaps not surprising that other demographic differences (in race/ethnicity, family structure, nativity, family member disability, maternal age at birth, number of children in the household, and child gender) play a fairly limited additional role in explaining income-related gaps in school readiness. These other demographic factors combined explain 16 to 19% of the gaps between low-income children and their middle-income peers, holding all else constant. The specific demographic factors that matter vary somewhat depending on which cognitive outcome we consider. The most consistent effects are those associated with differences in family size.

Residual (unexplained) component—Taken together, the variables observed in our data can account for between 72% and 81% of the score gaps between the lowest-income and middle-income children. The remaining unexplained component, then, captures the influence of income-related differences in all the factors that we are not able to measure. Some of these omitted characteristics are likely to be unaffected by the family's level of income even though they are correlated with it – parental cognitive ability being an obvious example. Other factors, however, such as parental stress or material hardship, are more likely to be responsive to the amount of income available.

II. What role can policies play?

This section focuses on the major policy levers that might reduce inequality in school readiness, taking into account what we know about the sources of inequality in early childhood as well as the likely effect of specific policies. As noted earlier, in order to reduce gaps in school readiness, policies must 1) be effective in addressing factors that are consequential in explaining the gaps and 2) do more to improve the performance of disadvantaged children than advantaged children (either because policies are targeted to disadvantaged children, or because universal policies close gaps in access to beneficial services or provide services that have a larger impact on the disadvantaged than the advantaged).

With this framework in mind, we now discuss each of the major early years policies that show promise to effectively address one or more of the factors that contribute to gaps in school readiness. We distinguish between five broad categories of early years programs and also briefly discuss the role that school and higher education policies could play.

As will be evident in the following discussion, early years policies may affect one or more of the factors that we found to be consequential in accounting for gaps. We illustrate this in Table 1.

Programs that provide support to parents during pregnancy and early childhood

Although home visiting programs as a group have had a mixed record of success, one specific program -- the *Nurse-Family Partnership* program based in the US (but now being piloted in the UK) -- has been shown in a series of randomized trials to be successful in meeting its goals of improving prenatal health, reducing dysfunctional care of children early in life, and improving family functioning and economic self-sufficiency. The program provides nurse home visiting to low-income first-time mothers, delivering about one visit per month during pregnancy and the first two years of the child's life. The program has been shown to improve nutrition and reduce maternal smoking during pregnancy, reduce preterm births, promote heavier birthweight, and also to reduce child abuse and neglect, as measured by reports of abuse or neglect, hospital emergency room visits for infants, and the number of visits specifically associated with an injury or ingestion (Olds et al., 2007). The program has also been found to improve parenting, increasing responsive and sensitive parenting as well as the quality of the home learning environment and parents' literacy activities, gains that have been translated to small improvements in behavioral and cognitive outcomes, but with larger effects for high-risk children (Olds et al., 2007).[7] Finally, the program also improves family functioning, delaying and reducing subsequent births to the first-time mothers served and increasing subsequent maternal employment (Olds et al., 2007). The success of this program, in contrast to other home visiting programs, has been attributed to the fact that it has developed a manualized intervention and that it uses highly trained nurses to deliver it. Cost-benefit analyses have found that the program, which currently costs $9,500 per family (Olds et al., 2007), saves on average $17,000 per family, with larger effects for high-risk families than lower-risk ones (Aos et al., 2004; see also Karoly et al., 1998; Karoly, Kilburn, and Cannon, 2005).

Similarly, although parent support and parent education programs often have weak results, some well-designed and intensive programs have proved effective (in randomized trials) at improving specific aspects of parenting and/or specific child outcomes. One parenting program with a strong evidence base is the *Incredible Years* program, which provides parent training for families with severely behaviorally disordered children. Such children are a small share of the population, but can be very disruptive both at home and in school. Incredible Years uses videotapes to teach parents how to manage difficult behavior and has been found to improve parents' ability to manage their children's behavior and to lead to improvements in both conduct disorder and attention (see e.g. Webster-Stratton, 1994; Sonuga-Barke et al., 2001; Jones et al., 2007). Positive impacts on behavior have also been found for the *Triple P-Positive Parenting Program* which like Incredible Years trains parents to better manage children's behavior (Sanders, 1999).

Another promising program – the *Play and Learning Strategies (PALS) program* –provides in-home training to parents of infants and toddlers focused on improving parents' responsiveness and sensitivity. The infant program includes 10 sessions; the toddler program is 12 sessions; and both programs use videotapes as a training tool. PALS has been found to substantially improve parents' responsiveness and sensitivity, their verbal encouragement of children, and their ability to maintain children's interest in activities, and these improvements in turn are reflected in small to moderate improvements in children's

[7]Following Cohen (1988), the term small refers to effect sizes of 0.20, moderate to effect sizes of 0.50, and large to effect sizes of 0.80. The effect size is calculated by dividing the change associated with a program by the standard deviation of the outcome.

attention, use of language, and vocabulary scores (Landry, Smith, and Swank, 2006; Landry, Smith, Swank, and Guttentag, in press; Landry, 2008).

There are also some literacy programs that have been shown to increase parents' literacy activities with children and to improve children's literacy outcomes. In the UK, for instance, the *PEEP (Peers Early Education Partnership) program* aims to foster reading readiness by providing parents with age-appropriate materials and supporting them in using the materials through either group sessions or home visits. A recent matched control study found that although children receiving PEEP started out with lower levels of literacy skills at age 2, they made greater gains than the control group on several measures of cognitive development between age 2 and age 4 or 5 (Evangelou, Brooks, Smith, and Jennings, 2005; see also Evangelou and Sylva, 2003). To reach parents who may not participate in formal programs, PEEP researchers are piloting a drop-in program delivered in a shopping center (see Evangelou, Smith, and Sylva, 2006). Another new program combines the Incredible Years intervention for behavior problems with an intervention designed to promote parents' support for reading; results from an experimental study find a significant effect of the intervention on parents' reading activities as well as children's reading and writing skills (Sylva et al., in press).

In terms of health- and nutrition focused programs, the *Special Supplemental Program for Women, Infants, and Children (WIC)* provides nutritional advice as well as help in purchasing healthy foods to low-income pregnant women and women with young children in the US. Although not all studies agree, the weight of the evidence indicates that WIC reduces low birthweight and improves child nutrition (see review in Currie, 2003, 2006). Since the WIC program is a capped appropriation (rather than an entitlement), there is scope for improving child health by expanding funding for WIC so that it covers all low-income children.

Smoking cessation programs for pregnant women are another promising policy. Randomized trials have shown that such programs reduce maternal smoking and also result in fewer low birthweight and preterm births (see reviews in Lumley, Oliver, Chamberlain, and Oakley, 2004; Case and Paxson, 2006).

Also relevant here are recent UK policy initiatives providing more income support to pregnant women and women with newborns through increased *maternity grants* and *baby grants* and extensions in *paid maternity leave*. Although these initiatives have not yet been evaluated, prior evidence suggests they should lead to improvements in maternal health and child health and development (Waldfogel, 2004, 2006).

Programs that combine parent support and early child care and education (for children age 0 to 2)

Although prior comprehensive child development programs for low-income families with young children have had disappointing results, two relatively new programs – Early Head Start in the US and Sure Start in the UK – have shown some success in improving child health and development by providing comprehensive services to low-income families. Both programs combine parent support with early child care.

Early Head Start, established in 1995 as an extension of the long-established Head Start program for 3 to 5 year olds, is designed for low-income children age 0 to 2 and supports a variety of service delivery models including home-based parent support programs, center-based child care programs, and mixed-approach programs that combine parent support and child care. Early Head Start remains a small program, currently serving only 3 percent of eligible children in this age group (Schumacher and DiLauro, 2008). A random assignment

study found that Early Head Start improved the quality of parenting (as measured by the emotional and support for learning subscales of the HOME) and also improved child test scores, behavior, and health, with the strongest effects generally found for the mixed-approach programs (Love et al., 2005). The magnitude of these gains was generally small, and a cost-benefit analysis has found that the cost of the program exceeds the benefits that have been documented to date (Aos et al., 2004). Nevertheless, Early Head Start is a potentially promising program and one that merits further development and experimentation.

Sure Start, begun as a pilot program for families in the lowest-income areas in 1999 and quickly expanded to other low-income communities, provides comprehensive services to families with children age 0 to 3. Sure Start is a community-based program – anyone residing in a Sure Start area can receive its services – and communities have a good deal of latitude in what services they offer, although all programs offer some core services such as outreach and home visiting as well as some child care (National Evaluation of Sure Start (NESS), 2008). Some Sure Start programs are led by health agencies and have a strong health focus, while others are led by social services agencies and have a stronger social services focus. Programs also vary in the extent to which they have emphasized the provision of center-based child care above and beyond what is already offered.[8] Since children were not randomly assigned to Sure Start, it has proved challenging to evaluate, and results from several rounds of evaluation studies have not always been consistent (see overview in NESS, 2008). However, the most recent evaluation of established Sure Start programs – using propensity score matching to compare outcomes at age 3 for children in Sure Start areas to outcomes for children from non Sure Start areas – indicates that Sure Start is associated with improvements in 7 of 14 outcomes assessed, including improvements in two aspects of parenting (reductions in negative parenting, improvements in the home learning environment), three aspects of child behavior (social development, positive social behavior, independence/self-regulation), and two health outcomes (increases in receipt of recommended immunizations, reductions in accidental injuries) (although the health effects may in part reflect over-time improvements rather than program effects) (NESS, 2008).

As part of the UK's Ten Year Childcare Strategy (see HM Treasury et al., 2004), Sure Start programs are now part of a broader initiative to locate children's centers in every community. These centers offer Sure Start services to low-income families but also serve as a hub for child care and other services for young children and their families.

Early child care and education (for children age 0 to 2)

Programs that focus primarily on delivering early child care and education to infants and toddlers have received less attention than the parent support or comprehensive programs for this age group, or preschool programs for slightly older children. In part, this reflects the strong preference that many parents in both countries have for parental care or informal child care for children in this age group, as well as the sense of many practitioners and policy developers that programs for young children should support parents as well as deliver child care and education. The limited provision for this age group also likely reflects the often contested evidence as to how early child care and education affects children age 0 to 2. In particular, while studies have shown that high-quality child care and education for infants and toddlers raises cognitive achievement, studies have also found associations between early and extensive child care and child behavior problems, particularly when care is of low-quality (Waldfogel, 2006), although recent analyses for the UK find cognitive benefits to early formal child care without adverse effects on behavior (Hansen and Hawkes, 2009).

[8]All 3 and 4 year old children now have access to a free part-time nursery place as part of the UK's universal child care initiative.

Useful policies in this area, then, would focus on improving the access of low-income children to high-quality care and education, by providing more support for low-income children to attend high-quality care and education and by implementing measures to improve the quality of care and education available to them (Waldfogel, 2006). As mentioned earlier, improving quality is challenging. In the US, there is a good deal of interest in *quality-contingent subsidy programs,* which provide higher subsidies for low-income families who use higher quality care and education. In both countries, there is interest in raising *regulatory standards* for early child care and education and in *monitoring* those settings more carefully. The UK is also piloting the expansion of *high-quality child care and education centers targeted to low-income 2-year-olds*.

One challenge to be grappled with here is whether such programs should be targeted to low-income children or available more universally. For this age group, given the limited amount of resources currently available to this sector (and in light of the strong preferences many families have to arrange their own care), it probably makes sense to focus on expanding quality-contingent support for low-income families, alongside continued efforts to improve the quality of provision.

Preschool programs (for children age 3 and 4)

For 3 and 4 year olds, there is strong evidence to support expansions in the US *Head Start* and *prekindergarten* programs, both of which have been shown to improve school readiness in rigorous studies. Studies of Head Start include the recent random assignment study, which found that Head Start resulted in small gains in child cognitive development, behavior, and health (Puma et al, 2005; see discussion and review of other studies in Currie, 2006; Gormley, 2007; Ludwig and Phillips, 2007). Studies documenting cognitive benefits of prekindergarten programs (with generally larger effects for disadvantaged children than for advantaged peers) include several state-level studies using regression discontinuity methods (see reviews in Waldfogel, 2006; Gormley, 2007). Head Start programs are on average more expensive than prekindergarten programs ($7,700 per child as compared to $3,500 per child, according to Gormley, 2007), in large part because prekindergarten programs often operate only part-day and only during the school year. However, gains in cognitive achievement associated with prekindergarten tend to be larger than those associated with Head Start, probably because prekindergarten programs are operated by school departments (or supervised by them) and are staffed by teachers.

Here, as with younger children, the question arises as to whether such programs should be targeted to low-income children or available more universally. While we favor a targeted approach for younger children, we think the case is strong in favor of universal provision for 3 and 4 year olds. Evidence on state prekindergarten programs makes a compelling case that these programs can deliver high-quality services that promote school readiness, and with larger effects for disadvantaged children. For this reason, we would emphasize universal provision of half-day prekindergarten for 3 and 4 year olds, retaining the Head Start program (with some quality improvements) to provide supplemental care and education services for low-income 3 and 4 year olds, as well as services for younger low-income children (through the Early Head Start program). We recognize that public funding for two years of prekindergarten for all children would be costly; however, all available evidence suggests that the benefits would more than outweigh the costs (see e.g. discussion in Gormley, 2007). An interim step would be to fund and provide universal prekindergarten to all 4 year olds, while ensuring that all low-income 3 year olds have access to either prekindergarten or Head Start. Another option would be targeting within a universally available program, using a sliding fee scale.

The UK, of course, already provides universal nursery education for 3 and 4 year olds and is working on improving the quality, availability, and affordability of its provision as part of its Ten Year Childcare Strategy (HM Treasury et al., 2004). However, challenges remain (see discussion in Butt, Goddard, La Valle, and Hill, 2007; Waldfogel and Garnham, 2008). The quality of care in this sector still leaves much to be desired, and there is still evidence that low-income children are less likely than their higher-income peers to take advantage of the provision. There is also still the challenge of providing good-quality child care during the hours that parents are working and children are not in nursery care, particularly when parents work irregular or non-standard hours. Child care subsidy funding has been greatly expanded but low-income parents still report difficulty in finding affordable care. Policy recommendations to address these problems include: setting higher quality standards; expanding wrap-around care (that combines child care with the part-time nursery provision); developing new models of care for families where parents work irregular and non-standard hours; and increasing the generosity and ease of accessing child care subsidies for the lowest-income families (Waldfogel and Garnham, 2008).

Policies to raise the incomes of poor families

US and UK policies differ in this area (see discussion in Waldfogel, 2007). In the US, unconditional cash supports for low-income families with children have been curtailed, and the largest single income transfer program for low-income families is now the work-conditioned Earned Income Tax Credit (EITC). As a result, in the decade following welfare reform, the only low-income families who saw income gains were those where parents moved into the labor market or increased their work hours (or earnings). In the UK, in contrast, work-oriented welfare reform is just one part of a multi-pronged anti-poverty initiative, which also includes increases in unconditional cash benefits for families with children, with particularly large increases in both *universal child benefits* and *means-tested income support* for young children.

While it is too soon to tell the impact of these reforms on child health and development, analyses of expenditure data reveal striking differences across the two countries. In the US, where income gains have been tied to increased work, low-income families are spending more money on work-related items – such as adult clothing and transportation (Kaushal, Gao, and Waldfogel, 2007). In the UK, in contrast, where all low-income families with children have seen income gains in the form of increased child-related benefits (regardless of whether parents are working), low-income families are spending more money on child-related items – such as children's clothing, and books and toys – while reducing their spending on alcohol and tobacco (Gregg, Waldfogel, and Washbrook, 2005, 2006).

Given the sizable income gaps among families with young children, there is certainly scope for further income supports for low-income families. This is particularly true in the US, where such supports are less generous and income gaps are wider. The evidence from the UK's recent reforms is promising, in that it suggests that when benefits are labeled as being for children, parents do spend the increased income on the children.

Policies to close gaps in parental education

There is also a considerable role for policy to play in promoting the education of the next generation of parents, as well as in attempting to redress inequality of education in the current generation. In the US, a good deal of attention is focused currently on reducing achievement gaps for students in primary and secondary school and in improving high school graduation rates (see e.g. Murnane, 2007). Such initiatives if successful would go a long way toward narrowing the gap in parental education in the next generation. But they are not sufficient. Given the increased demand for skill in the labor market, a high school

education is no longer adequate to ensure that parents can support a family above the poverty line. Therefore, further efforts to increase the college enrollment and completion of low-income youth are also needed. Similarly in the UK, policy initiatives to raise the school leaving age are welcome but must be pursued in tandem with efforts to raise the share of low-income youth going on to higher education.

IV. Conclusion

In their quest to close income-related gaps in school achievement, researchers and policymakers have begun to focus more attention on the sizable income-related gaps in school readiness that exist even before children enter school. Our analysis of contemporary birth cohort data from the US and UK suggests that this attention is warranted. In both countries, sizable income-related gaps in cognitive development are already apparent in early childhood -- before children start school.

Our analysis also sheds some light on what factors might account for these gaps. While our analysis cannot show whether the factors we examine cause gaps or are simply markers for families at risk of such gaps, our accounting does provide information as to which sets of factors are more or less predictive of gaps. Income-related differences in parenting style and the home learning environment appear to be the strongest predictors, together accounting for between a third and a half of the income-related gaps in cognitive performance between low-income and middle-income children in our decomposition using the US data. Other explanatory factors include differences in maternal health and health behaviors, child health, early childhood care and education, maternal education and other demographic differences, and income itself.

What policy levers could most effectively address these gaps in the early years? The good news here is that a number of promising programs have been shown to effectively address one or more of these factors. In the parenting domain, high-quality home visiting or parent training programs such as the Nurse-Family Partnership, PALS, and PEEP have been shown to be effective at improving parenting style and the home learning environment. Both Early Head Start and Sure Start, while posting somewhat modest effects, nevertheless have out-performed earlier efforts at comprehensive early child development programs. And, the track record for preschool programs (such as Head Start and prekindergarten in the US) is quite strong, and our estimates suggest that expansions in those programs could make a substantial difference in narrowing the income-related gaps in school readiness that we have documented. Also good news is that the most effective programs often improve more than one set of factors. Some of the best parenting programs, for instance, also improve child health or maternal health behaviors (see, e.g., the evidence on the Nurse-Family Partnership).

Of course, policymakers need to know not just what programs are effective, but what their relative costs and benefits are. Some programs that are effective in improving outcomes for disadvantaged children have been found to be cost-effective, but others have not. However, assessing the relative costs and benefits of these programs is not straightforward. Many programs have not had cost-benefit analyses because information to do so has been lacking. Moreover, even when cost-benefit analyses have been conducted, their results are not readily comparable because children have been followed for different time periods and different sets of outcomes have been tracked. A full comparison of the relative costs and benefits of these programs is beyond the scope of this paper but would be a useful next step.

In the meantime, the analysis in this paper points to several promising directions for policymakers to consider. Among these we would place the highest priority on 1)

expansions in parenting-oriented programs, including those that target several aspects of parenting alongside other domains (programs such as the Nurse-Family Partnership) as well as those that focus more narrowly on specific aspects of parenting related to school readiness (programs such as PALS and PEEP); 2) continued efforts to develop and improve programs such as Early Head Start and Sure Start that have the potential to combine high-quality child care and family support for low-income children age 0 to 2; and 3) expansions in high-quality preschool programs for 3 and 4 year olds, housed in the schools or linked to them.

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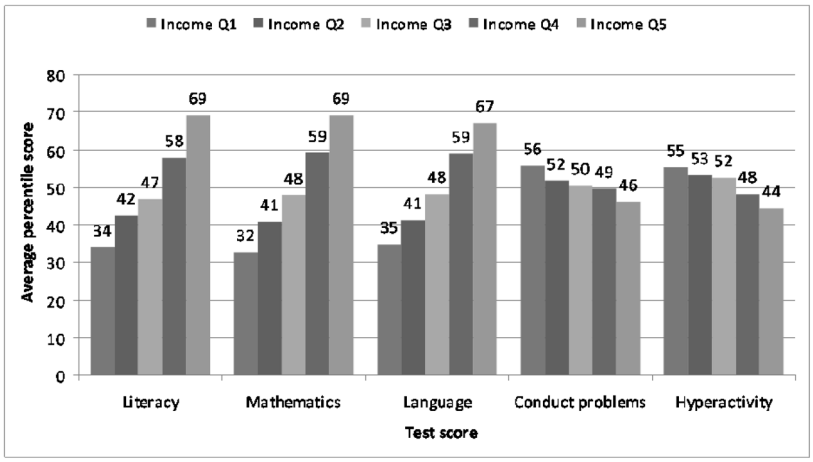

Figure 1.
Mean school readiness scores in the ECLS-B (US) cohort at age 4, by income quintile (N = 7950)

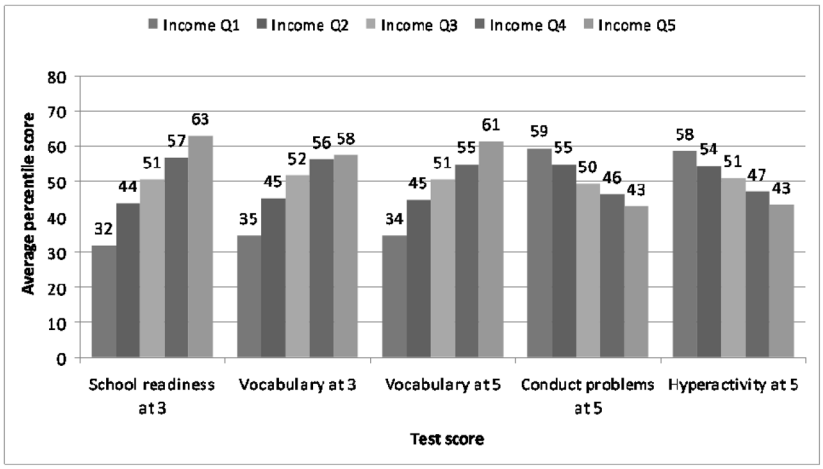

Figure 2.
Mean school readiness scores in the MCS (UK) cohort at ages 3 and 5, by income quintile (N = 10,476)

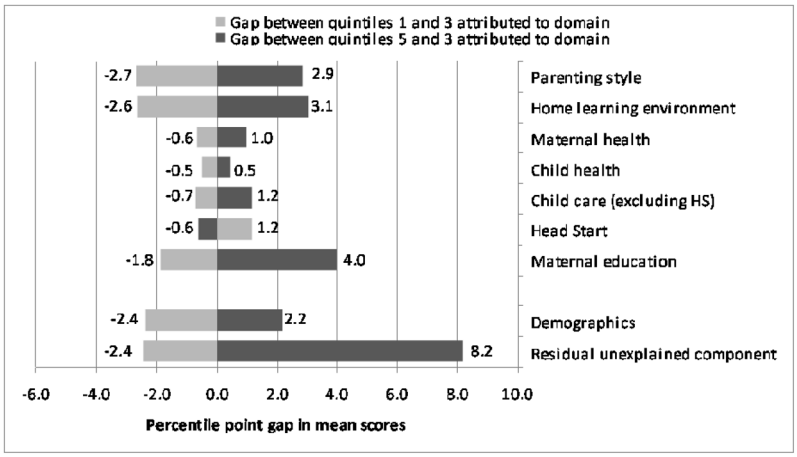

Figure 3.
Decomposition of the test score gaps between income quintile groups: ECLS-B literacy score

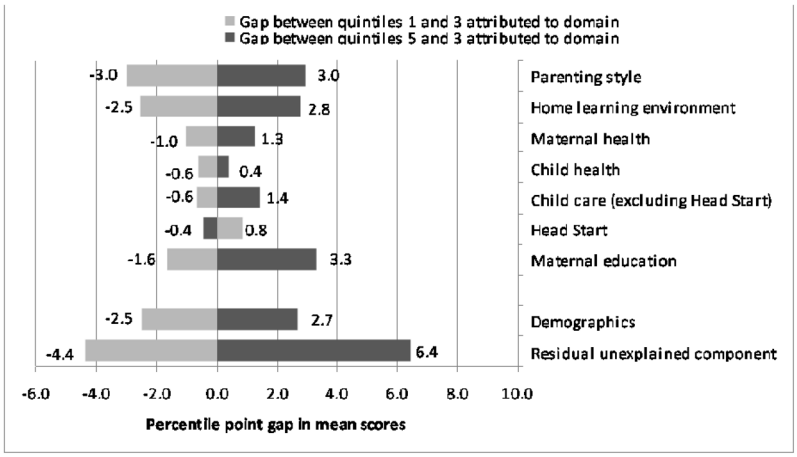

Figure 4.
Decomposition of the test score gaps between income quintile groups: ECLS-B mathematics score

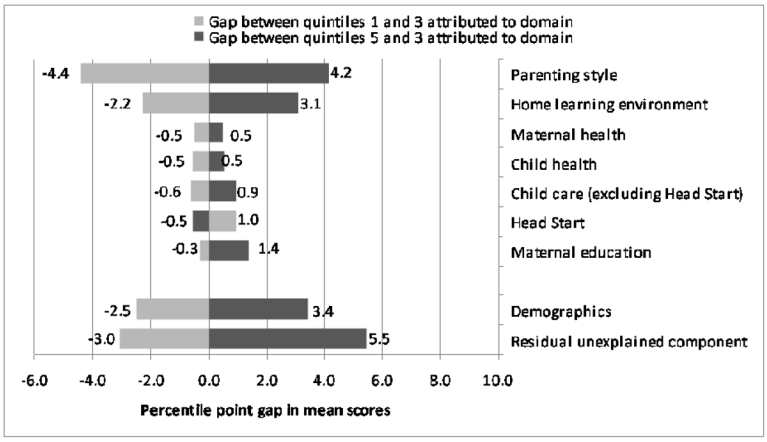

Figure 5.
Decomposition of the test score gaps between income quintile groups: ECLS-B language score

Table 1

Major types of early childhood programs and their effects on factors associated with income-related gaps in school readiness

	(1)	(2)	(3)	(4)	(5)
I.					
II.					
III.					
IV.					
V.					

Appendix Table 1

Decomposition of the income-related gaps in cognitive school readiness scores in the ECLS-B (US) cohort

	Percentile point gap in mean scores between income quintile Q and income quintile 3 attributed to domain [% of total raw gap attributed to domain]					
	Literacy score		Mathematics score		Language score	
Domain	**Q=1**	**Q=5**	**Q=1**	**Q=5**	**Q=1**	**Q=5**
Parenting style	−2.67 [21.0]	2.87 [12.9]	−2.98 [19.2]	2.96 [14.1]	−4.38 [32.9]	4.15 [21.8]
Home learning environment	−2.62 [20.7]	3.05 [13.7]	−2.52 [16.2]	2.78 [13.3]	−2.24 [16.8]	3.10 [16.3]
Maternal health & health behaviors	−0.65 [5.1]	0.99 [4.5]	−1.00 [6.5]	1.28 [6.1]	−0.47 [3.5]	0.52 [2.7]
Child health	−0.48 [3.8]	0.48 [2.1]	−0.59 [3.8]	0.42 [2.0]	−0.53 [4.0]	0.54 [2.9]
Child care (excluding Head Start)	−0.72 [5.7]	1.16 [5.2]	−0.64 [4.1]	1.44 [6.9]	−0.60 [4.5]	0.94 [4.9]
Ever in Head Start	1.17 [−9.2]	−0.62 [−2.8]	0.85 [−5.5]	−0.45 [−2.1]	0.97 [−7.3]	−0.51 [−2.7]
Mother's education	−1.85 [14.6]	4.00 [18.0]	−1.62 [10.4]	3.34 [15.9]	−0.29 [2.2]	1.41 [7.4]
Demographics	−2.36 [18.6]	2.22 [10.0]	−2.47 [15.9]	2.71 [13.0]	−2.48 [18.6]	3.43 [18.0]
All missing dummies	−0.07 [0.5]	−0.03 [−0.1]	−0.24 [1.5]	0.01 [0.0]	−0.26 [1.9]	0.03 [0.1]
Residual unexplained component	−2.45 [19.3]	8.15 [36.6]	−4.36 [28.0]	6.44 [30.8]	−3.04 [22.8]	5.45 [28.6]
Total raw gap (Sum of rows above)	−12.68 [100]	22.27 [100]	−15.56 [100]	20.93 [100]	−13.31 [100]	19.06 [100]

N = 7950.