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Long-Run Economic Effects of Early Childhood Programs on Adult Earnings

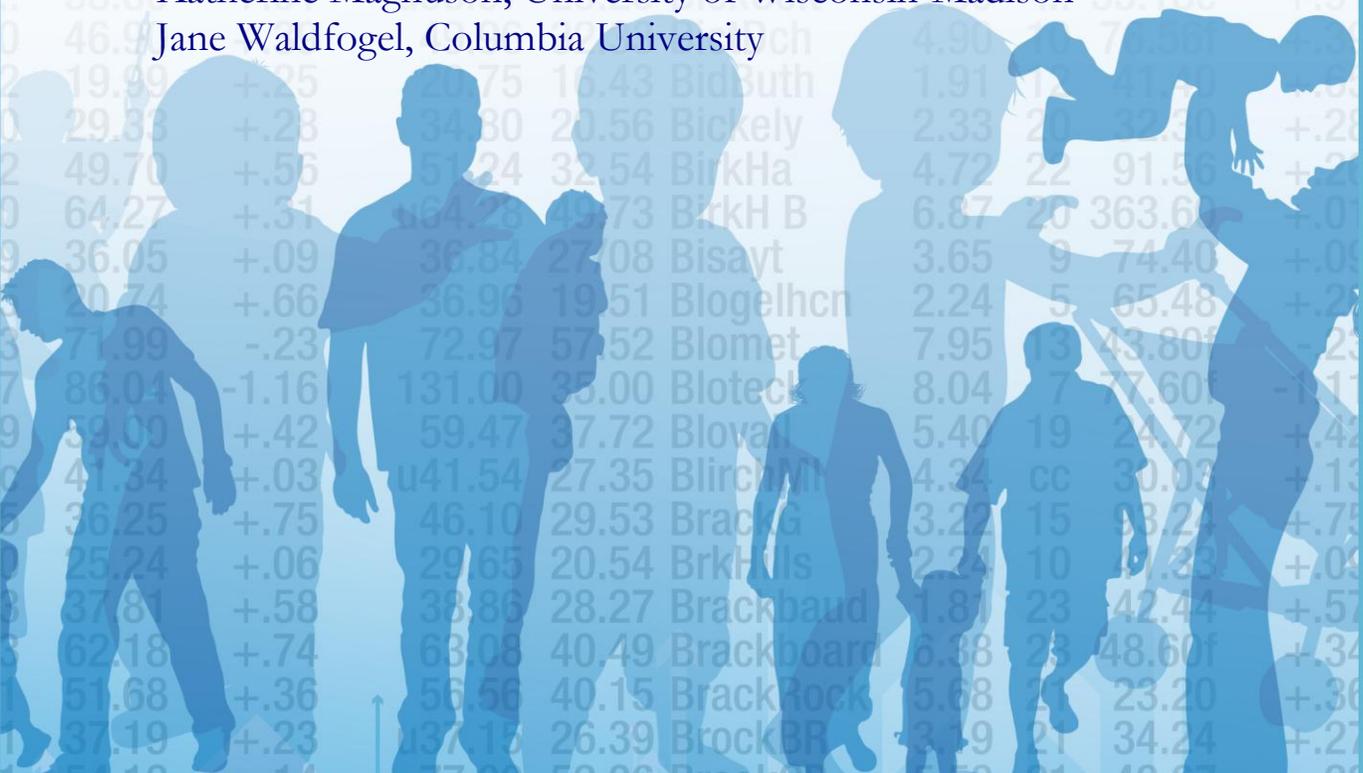
Executive Summary

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Need to Develop this Methodology

Researchers and policymakers alike want to better understand the long-run effects of investments in children's well-being. Yet, only a few studies have examined how participants in early childhood interventions fare as adults. These studies suggest that early investments may have sizable payoffs for children's later success. Such studies are valuable, but also rare and costly. In the absence of long-run data on children's outcomes, how can we determine the long-run monetary value of improvements in young children's well-being?

In this report we describe a way to estimate the connections between improvements in aspects of children's early health, achievement, and behavior, as well as early parenting, to improved labor market outcomes when they become adults. Our results suggest that investments in early childhood that improve these aspects of development will likely have important payoffs. However, the magnitude of these payoffs is strongly dependent on the extent to which early program effects are maintained over time.

Methods

The most direct way to estimate the effects of early interventions on later outcomes is to randomly assign children to a treatment group that receives the intervention or to a comparison group that does not receive the intervention, follow both groups of children years after the intervention has ended, and compare them on important outcomes (ideally with a large sample and multiple sites). However, this takes considerable time and can be very costly. In addition, long-term studies are often plagued by attrition, which makes it difficult to accurately estimate long-run program effects.

We describe two approaches to estimating the long-run effects of early interventions on adult earnings. In the first, we look for evidence directly linking an early childhood outcome to later earnings. For example, several high quality studies have linked low birth weight to later earnings. We use the second approach for early childhood outcomes whose links with later earnings are not well studied, in that studies are rare and often specific to a particular population. Thus, for the domains of early achievement, behavior, and parenting, we engaged in a two-step estimation process. First, we surveyed the literature to arrive at an estimate of the extent to which early achievement, behavior, and parenting predict achievement during adolescence, and second, we surveyed the literature to determine the extent to which achievement during adolescence predicts success in the labor market as measured by adult earnings. It is important to note that a drawback of this approach is that, in contrast to directly assessing the effect of early outcomes on later labor market outcomes, the economic benefit of only one pathway of influence is estimated, and so our estimates will likely understate the full benefits.

Translating results from empirical studies into specific dollar amounts required that we estimate the value of lifetime earnings for an infant or a young child. We calculated value of earnings for individuals with a high school degree or some college (the average worker in the U.S.) in 2006

dollars. We report in this executive summary middle-range estimates which assume 1 percent growth in wages and a 3 percent discount rate (the full report includes estimates based on a range of values for both wage growth and discount rates). Although we present these findings as point estimates, it is important to recognize that like the empirical estimates they are derived from, they represent the midpoint of confidence intervals.

Health: Low Birth Weight

We begin by estimating the economic value of preventing low birth weight, an important early health outcome. We find that the value of preventing a low birth weight birth ranges from \$60,261 to \$90,393 (depending on assumptions about the effect of low birth weight on earnings). These estimates approximate the value of preventing low birth weight for an individual, but we might also want to understand the value of a program to prevent low birth weight, such as the Supplemental Nutrition Program for Women, Infants, and Children (WIC). Using the above assumptions, we estimate the present value of the benefits of WIC with respect to reducing low birth weight to be between \$1,416 and \$2,123. If the WIC program improves other early outcomes for children that translate into higher earnings, the long-run benefits of the program will be larger.

Achievement: Academic Skills

We next examine early academic skills, which are the foundation of later learning, using the two step method outlined above. The estimated economic value of a one standard deviation improvement in early achievement varies depending on the assumptions made, ranging from a low value of \$13,294 to a high value of \$106,350. However, a standard deviation is a much larger improvement than any single program is likely to produce. If a program had more moderate effects, raising both math and reading scores by 0.40 of a standard deviation, the likely economic benefits would range from \$10,634 to \$53,175.

Behavior: Attention Skills

An important dimension of early behavior is a child's ability to pay attention and focus on tasks at hand. Again applying a two-step method, first estimating the links between early attention skills and later achievement, and second estimating the link between later achievement and adult earnings, we find that increasing a child's attention skills by one standard deviation at age 5 is likely to yield between \$3,323 and \$15,000 in benefits. The expected value of programs that seek to improve children's attention is likely to be smaller given that the average effect of programs on children's attention is also likely to be smaller, with benefits in the range of \$1,994 to \$11,698.

Parenting: Home Environment

Studies of child development consistently point to the important role played by the parenting children receive in early childhood. Our estimates indicate that improvements in the early home environment can yield sizable benefits in adult earnings. Our middle-range estimates suggest benefits of between \$7,976 and \$33,899. A program such as Early Head Start that improved the home environment by 0.10 of a standard deviation would provide between \$798 and \$3,390 in benefits (counting only its effects that worked through improving home environments).

Conclusions

Our key substantive finding is that early improvements in child health, academic achievement, and behavior as well as improved parenting can yield sizable economic benefits for adult earnings. This is all the more striking when we recall that our estimates, for the most part, capture only a portion of the effects that early interventions are likely to have. Given data constraints for early achievement, attention, and the home environment we have focused on effects that work through improvements in school achievement in adolescence and that result in gains in one adult outcome, earnings. We have ignored effects that work through other intermediate outcomes, such as behavior and health, including peer effects, as well as effects on other adult outcomes, such as physical health. Moreover, our estimates do not take into account any synergies that might arise from concurrent improvements across more than one domain. If we could measure the full range of effects, the economic payoffs would surely be much larger than those estimated here.

Our key methodological contribution is the development and application of a two-step method for linking improvements in early outcomes to long-run economic gains. To date, estimates of the long-run effects of early intervention programs have primarily relied on the relatively few studies that track program participants over time. Although such estimates have proved extremely useful, the downside of that approach is its reliance on a very small number of studies, and studies that often represent “hothouse” interventions delivered to very disadvantaged participants, often many decades ago. Our method allows for the use of nationally representative data from more contemporary samples to piece together the likely effects of improvements in domains of early health and development on later outcomes, even when long-run follow-up data are lacking. As such, the method outlined here can be used flexibly to estimate a range of program impacts and to help analysts and policymakers think about the relative merits of addressing one type of early health or developmental problem rather than another.