Predicting adult criminal behavior from juvenile delinquency: Ex-ante vs. ex-post benefits of early intervention

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A B S T R A C T

Recent analyses of the long-term societal benefits from early intervention (prenatal care, home visitation, and high quality preschool) for at-risk children commonly include significant savings to society in the form of reduced juvenile delinquency and adult criminal behavior. However, a nontrivial proportion of the reported benefits of several early intervention programs are based on forecasts of criminal behavior throughout adulthood conditional on intervention effects on delinquency in adolescence. Data from the Chicago Longitudinal Study (CLS), an investigation of the life course of 1539 children from low-income families born in 1979–1980, are used to investigate the bias resulting from predicting the effect of early intervention on adult criminal behavior from the effect on delinquency in adolescence. The investigation concludes that the general method used to predict adult criminal behavior results in a conservative estimate of the reduction in the cost of adult criminal behavior attributed to early intervention.

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1. Introduction

A significant source of the societal benefits from public investment in early education for at-risk children is the reduction in the cost of juvenile delinquency and adult criminal behavior. For example, nearly two thirds of the total estimated benefit attributed to the infamous Perry Preschool Program consists of Criminal Justice System (CJS) savings and averted criminal victimization costs associated with the intervention's effect on delinquency and criminal behavior (Barnett, 1996; Heckman, Moon, Pinto, Savelyev, & Yavitz, 2010). Similarly, approximately 50% of the benefit attributed to the Chicago Child–Parent Center (CPC) preschool program consists of savings related to the intervention's effect on juvenile delinquency and adult criminal behavior (Reynolds, Temple, Robertson, & Mann, 2002; Reynolds, Temple, White, Ou, & Robertson, 2011). To a lesser extent, CJS savings also represent a significant proportion of the estimated benefits of prenatal intervention and early home visitation (Glazner, Bondy, Luckey, & Olds, 2004; Karoly, Greenwood, Everingham, Hoube, & Kilburn, 1998).

While the benefits of reduced juvenile delinquency and adult criminal activity comprise a sizable proportion of the estimated societal returns of early intervention programs, researchers typically do not have access to complete adult criminal records for program and comparison group participants. In several well-cited evaluations, the effect of the intervention on adult criminal behavior and the associated costs are forecasted primarily from limited information on the effect of the intervention on delinquency in adolescence (e.g., Karoly et al., 1998; Reynolds et al., 2002).

Table 1 shows the predicted reduction in the cost of juvenile delinquency and adult criminal behavior associated with three early intervention programs with long-term follow-up occurring at different ages. While all three programs (the Perry Preschool Program, the Chicago Child–Parent Center preschool program, and the Elmira Prenatal/Early Infancy Project) generate considerable cost savings to society in the form of reduced delinquency and

Table 1
Benefits attributed to three early interventions (present value 2008 dollars).

	Perry Preschool Program	Child–Parent Center Program	Prenatal/Early Infancy Project
Average age at follow up	27	21	15
Measured crime benefit	$75,262	$25,172	$2,684
Forecasted crime benefit	$32,744	$18,976	$10,890
Total crime benefit	$108,006	$44,148	$13,574
Total benefit	$165,739	$89,721	$42,218
Total crime benefit/total benefit	0.65	0.49	0.32
Forecasted crime benefit/total crime benefit	0.30	0.43	0.80

Source: Estimates for the Perry Preschool Program, the Chicago Child–Parent Center preschool program, and the Elmira Prenatal/Early Infancy Project are from Barnett (1996), Reynolds et al. (2002), and Karoly et al. (1998), respectively. Estimates are converted to 2008 dollars using the Bureau of Labor Statistics' Consumer Price Index for All Urban Consumers (CPI-U).

adult criminal behavior, the reliance on anticipated, or predicted, benefits is greater at earlier ages of follow-up. For example, 80% of the reduction in the cost of juvenile delinquency and adult criminal behavior attributed to the Prenatal/Early Infancy Project is forecasted from the intervention's effect on the mean number of juvenile arrests by age 15 (Karoly et al., 1998), and approximately 43% of the reduction in the cost of delinquency and criminal behavior attributed to the CPC program is forecasted from the intervention's effect on the mean number of petitions to juvenile court between age 10 and 18 (Reynolds et al., 2002). In comparison, in the age-27 benefit–cost analysis of the Perry Preschool Program, which employs data on delinquency and adult criminal behavior through age 28, less than a third of the reduction in the costs of delinquency and criminal behavior is forecasted beyond age 28 (Barnett, 1996).

Although juvenile delinquency is believed to be associated with adult criminal behavior, the true relationship is inexplicit. Furthermore, the potential consequences of forecasting effects on adult criminal behavior from intervention effects on juvenile delinquency for analyses of programs and policies aimed at improving life-course outcomes for at-risk children are unclear.

As discussed in a leading text on benefit–cost analysis (Boardman, Greenberg, Vining, & Weimer, 2006), few published studies retrospectively compare ex-ante predictions of program benefits and costs to ex-post results. To illustrate a potential consequence of relying on ex-ante predictions, Boardman et al. (2006) compare three independent benefit–cost analyses conducted at different phases of an infrastructure project. Two of the analyses relied heavily on predicted benefits and costs, while the ex-post evaluation employed observed benefits and costs. All three analyses generated different net present value estimates with inconsistent conclusions about whether the benefits of the project exceeded the initial costs. Although seemingly different, infrastructure development and early intervention for at-risk children represent investment potential, and the discussion by Boardman et al. (2006) suggests that the results of benefit–cost analyses relying on ex-ante predictions, which are often considered in investment decisions, potentially differ significantly from the results of analyses based on ex-post observations. Considering the importance of predicted crime benefits attributed to early intervention for at-risk children in the current literature, an investigation of the

robustness of the method commonly used to forecast and monetize intervention effects on adult criminal behavior from observed effects on juvenile delinquency for benefit–cost analyses of early intervention programs is warranted.

Two evaluations use a similar framework to estimate the effect of the early intervention on adult criminal behavior conditional on the effect of the intervention on juvenile delinquency. The general method of extrapolation employed by Reynolds et al. (2002) in the initial benefit–cost analysis of the CPC preschool program and by Karoly et al. (1998) in the analysis of the Elmira Prenatal/Early Infancy Project is to first assume that the intervention effect on criminal behavior at the beginning of adulthood is equal to 80% of the observed effect on juvenile delinquency, which presumably represents the decaying of the intervention effect between adolescence and the beginning of adulthood. Second, the predicted effect on adult criminal behavior is multiplied by the target population crime rate, which is defined as the percentage of the population targeted by the intervention expected to have an adult criminal career. Demographic information is commonly used to approximate the target population crime rate. Finally, a simple desistance rate of 10% per year is assumed so that the anticipated intervention effect on adult criminal behavior approaches zero by mid adulthood. The predicted effect undoubtedly depends largely on the documented relationship between delinquency in adolescence and criminal behavior in adulthood (see Greenwood, Model, Rydell, & Chiesa, 1996; Swain, 1983; Teilmann Van Dusen & Mednick, 1983).

Using data from the Chicago Longitudinal Study (CLS) on juvenile delinquency through age 18 and adult criminal behavior through age 26 for CPC preschool program and comparison group participants, the current analysis compares the anticipated effect of one or more years of CPC preschool participation on adult criminal behavior, forecasted from the effect on delinquency in adolescence, to the observed intervention effect on adult criminal behavior. In addition, the difference between the present value of the predicted and observed CPC effect on adult criminal behavior is discussed, and the degree to which the disparity affects the results of the initial benefit–cost analysis of the CPC preschool program is examined.[1]

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[1] See Levin and McEwan (2001) for a discussion on discounting and net present value.