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978-1-107-03834-9 - Health and Education in Early Childhood: Predictors,
Interventions, and Policies

Edited by Arthur J. Reynolds, Arthur J. Rolnick and Judy A. Temple

Excerpt

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Introduction and overview

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1 Early childhood health and education: policies and interventions to promote child well-being

*Arthur J. Reynolds, Arthur J. Rolnick,
and Judy A. Temple*

Introduction

The early years of childhood represent a crucial window of opportunity for investments in skills or capabilities that can place children on the path to well-being in adulthood. Many recent studies in the last decade have focused on the importance of early human capital investments in academic and social skills for promoting long-term educational and economic success. The chapters in this volume explicitly examine the role of health – another type of human capital – in promoting children’s early and later educational success and well-being. The impacts of health and education outcomes of salient programs, policies, and practices are summarized with an emphasis on policy implications.

The chapters present conceptual issues, research findings, and program and policy implications of promoting good health and school readiness in the first five years of life. These chapters were written by leading researchers in the multidisciplinary study of early learning and human capital formation and represent revised and updated versions of presentations made at a national invitational conference that was held at the Federal Reserve Bank of Minneapolis in late 2010.

The book addresses three important themes. The first is the integration of both early health and education as important building blocks of current and later child well-being. Health practices and behaviors interact with educational and social experiences to affect outcomes for children and families. A variety of determinants of child and adult well-being such as prenatal care, family poverty, and access to high-quality early learning programs express their influence early in life yet are often investigated in isolation from each other. This is due in part to the fragmentation of fields of inquiry and the allocation of resources and funding. A multidisciplinary approach to summarizing knowledge in these areas is important for a more holistic perspective on the common predictors of

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early childhood outcomes and the importance of early childhood experiences for understanding longer-term differences in well-being.

The roles of early skills and capabilities for promoting future well-being are of central importance in many fields in social science and public health. Economist James Heckman has formulated a formal model of skill development that explicitly demonstrates that “students with greater early capacities (cognitive, noncognitive and health) are more efficient in later learning of both cognitive and noncognitive skills and in acquiring stocks of health capital” (Heckman, 2007, p. 4). This is consistent with ecological and life course models of human development (O’Connell, Boat, and Warner, 2009). Human capital investments are multifaceted, including academic skills, socio-emotional skills or behaviors, and health, and research suggests cross-linkages among them. For example, Cunha and Heckman (2008) show that the accumulation of socio-emotional skills promotes the acquiring of cognitive skills. Greater cognitive and socio-emotional capabilities may promote health and vice versa. Early accumulation of all three types of capabilities makes later investments in them more effective. The discussion in this volume is enhanced by the wide range of disciplinary approaches represented by the authors as they provide examples and summarize the literature on these linkages among education and health. Just as access to early childhood education programs contributes to later health outcomes and the reduction of health disparities, prenatal care and nutrition contribute to school readiness and the reduction of disparities in educational achievement.

The second theme is a focus on the wide set of possibilities for interventions and policies that begin in the earliest years of child development. The etiology of child outcomes begins prenatally and the magnitude and significance of early influences remain important throughout the early years of childhood (O’Connell et al., 2009; Reynolds, Temple, and White, 2011). Not only are the determinants of learning (e.g., school readiness) and socio-emotional skills and health behaviors (e.g., antisocial behavior and obesity) expressed early but the opportunities in the early years to effectively intervene to prevent learning problems and to promote positive behavioral and health outcomes are great. This volume covers a wide spectrum of these early determinants of child outcomes ranging from poverty, prenatal nutrition, and oral health to parenting practices, cognitive development, and social-emotional skills. A comprehensive set of early interventions also are considered including their health and educational impacts in the short and longer term. These include prenatal nutrition programs, home visiting, early learning programs in child care and Head Start centers, income support programs, and intervention to prevent obesity and early conduct problems. Educational and health policy reforms also are covered.

The third theme of the volume is the focus on multiple levels of strategies to promote early development. Interventions to improve well-being vary

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dramatically in scale including programs offered to individuals and families, to policies intended to affect school and community contexts and to large-scale reforms in education and health care systems. Each of these levels is part of the ecological perspective that is necessary to address health and social issues comprehensively. Prenatal nutrition and home visiting interventions to strengthen parenting skills, for example, directly impact child development outcomes whereas multi-component early childhood interventions enrich the learning environments of young children in a broader way. Social and health policies and reforms (e.g., access to health care or early childhood education) increase resources and access to needed services, which are expected to carry over to child and family outcomes. Consistent with the ecological perspective, this book will include the full continuum of interventions.

These themes provide a unique and comprehensive framework to better understand how early childhood health and education predictors and interventions contribute to well-being at individual, family, community, and societal levels and to policy development. Key child outcomes in the chapters include nutritional status, parenting, cognitive development and school readiness, conduct problems and antisocial behavior, obesity, and well-being in later childhood and adulthood. These outcomes are representative of the targeted goals established by the Centers for Disease Control and Prevention in the US Department of Health and Human Services. To promote a more integrated vision of health promotion, the Centers for Disease Control and Prevention established the Healthy People Initiative. The four comprehensive, national goals of Healthy People 2020 are as follows:

- attain high-quality, longer lives free of preventable disease, disability, injury, and premature death;
- achieve health equity, eliminate disparities, and improve the health of all groups;
- create social and physical environments that promote good health for all;
- promote quality of life, healthy development, and healthy behaviors across all life stages.

Although these overarching goals and the many related health-promoting activities ranging from nutrition and oral health to prevention of violence and mental health problems have their origin in prenatal and early childhood development, the importance and complicated nature of these goals reinforce the importance of interdisciplinary research spanning education, allied health, psychology, economics, and policy fields. Among the topics identified by Healthy People 2020 that are covered in this volume are oral health, nutrition and weight status, social

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determinants of health, mental health and mental disorders, maternal, infant and child health, injury and violence prevention, disability and health, educational and community-based programs, access to health services, and physical activity.

Many of the health and education topics policies recommended in this volume are or potentially could be recommended to policymakers on the basis of their cost-effectiveness. The impact and cost-effectiveness of health and educational interventions are an increasingly important area of focus. The avoidable annual costs of violence (Cohen, 1998), school dropout (Levin et al., 2007), substance abuse, and mental health problems (O'Connell, Boat, and Warner, 2009; Greenberg et al., 2003) exceed \$500 billion.

A summary of current evidence on the economic returns of many interventions affecting young children is shown in Table 1.1. More discussion of the estimates in this table can be found in Reynolds, Temple, and White (2011). Most of the interventions that have had economic analysis of costs and benefits show a return of at least one dollar for every dollar of cost. Several programs, such as preschool interventions primarily for children at risk, show benefits that far exceed costs. Certainly, many effective programs and those programs that are promising in the early stages may be worth implementing even though the return on investment has not been calculated. Scaling up small proven or promising programs to include more families while ensuring effective implementation is a critical need at the forefront of health and educational policy development.

Overview of individual chapters

The volume begins with a set of chapters that provide a broad overview of the determinants of health disparities beginning in childhood. Part I begins with Paula Braveman and her co-authors Susan Egerter and Robin Mockenhaupt discussing the social determinants of health with a focus on the role of education. The social determinants of health include factors outside of medical care that can be influenced by social policies and are likely to have important effects on child and adult well-being. Recent evidence is presented revealing marked disparities in health by income and education as well as by race or ethnic group in the US. Braveman and colleagues present a conceptual framework for considering and addressing how health disparities are created, exacerbated, and perpetuated across the lifetimes of individuals and across generations.

Identifying the relationship between early childhood poverty and adult productivity and health is the objective of the chapter by Greg Duncan,

Table 1.1 *Cost-effectiveness estimates for early childhood programs, birth to third grade.*

Development stage	Source	Focus	Location	2007 dollars ^a		
				Benefits	Costs	B/C
Birth to age 3						
WIC ^b	Avruch and Cackley (1995)	Targeted	National	1,206	393	813
NFP, Low SES	Glazner et al. (2004)	Targeted	Elmira, NY	83,850	16,727	67,123
NFP, Higher SES	Glazner et al. (2004)	Targeted	Elmira, NY	25,317	16,727	8,590
preschool						
Child-Parent Centers	Reynolds et al. (2002)	Targeted	20 Chicago sites	86,401	8,512	77,889
Perry Preschool	Schweinhart et al. (2005)	Targeted	1 Ypsilanti site	294,716	18,260	276,456
Abecedarian ^c	Barnett and Masse (2007)	Targeted	1 NC site	182,422	73,159	109,263
RAND study of preschool in CA	Karoly et al. (2005)	Universal	State of CA	12,818	4,889	7,929
National pre-K synthesis for 2050 ^d	Lynch (2007)	Targeted	National	20,603	6,479	14,124
	Lynch (2007)	Universal	National	12,958	6,479	6,479
Synthesis study	Aos et al. (2004)	Targeted	58 programs	19,826	8,415	11,411
Kindergarten						
Full-day K synthesis ^{e,f}	Aos et al. (2007)	Universal	23 programs	0	2,685	-2,685
School-age						
Tennessee STAR (class size reduction, K-3)	Krueger (2003)	Universal	79 schools	27,561	9,744	17,817
Synthesis of reduced class sizes, K-2 ^{g,h}	Aos et al. (2007)	Universal	38 studies	6,847	2,454	4,393
Synthesis of reduced class sizes, grade 3-6 ^{e,g}	Aos et al. (2007)	Universal	38 studies	3,387	2,454	933
Child-Parent Centers School-Age Program	Reynolds et al. (2002)	Targeted	20 Chicago sites	8,089	3,792	4,297
Reading Recovery ^f	Shanahan and Barr (1995)	Targeted	General	1,679	5,596	-3,151
Skills, Opportunities, and Recognition	Aos et al. (2004)	Universal	Seattle schools	16,256	5,172	11,084

Table 1.1 (cont.)

Development stage	Source	Focus	Location	2007 dollars ^a		
				Benefits	Costs	B-C
PK-3 Intervention						
Child-Parent Centers Extended Program	Reynolds et al. (2002)	Targeted	20 Chicago sites	47,161	5,175	41,986
						9.11

Note. Findings from the Perry Preschool are at age 40. At age 27, B-C was \$141,350 and B/C ratio was \$8.74 (Barnett, 1996).
^a All estimates are converted to 2007 dollars using the Consumer Price Index for All Urban Consumers (CPI-U).
^b Estimates are based on a meta-analysis of studies investigating the effects of WTC.
^c The cost for the Abecedarian Program represents the total costs of the intervention.
^d Estimates for Lynch's (2007) synthesis of targeted and universal preschool represent annual per pupil program costs and associated annual government budget benefits. Total accrued benefits to government, the general public, and program participants and their parents relative to costs are \$12.10:1 and \$8.20:1 for the targeted and universal programs, respectively.
^e Estimates are not based on formal cost-benefit analyses.
^f The cost of full-day kindergarten is relative to the cost of half-day kindergarten in Washington State.
^g Estimates from syntheses of reduced class sizes assume a reduction from 25 to 15 pupils per class.

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Ariel Kalil, and Kathleen Ziol-Guest. Analyses of correlational data show that children from poorer families have lower achievement, exhibit more problem behaviors, and have worse health compared to children from more affluent families. Duncan and co-authors focus on a set of studies that attempt to identify the causal impact of poverty in early childhood on later educational attainment and health. The authors argue that poverty during the prenatal time period as well as in early childhood has substantial negative effects on adult earnings, work hours, and specific health conditions.

Michael Georgieff's chapter on the impact of maternal and child nutrition on cognitive development focuses on the scientific evidence for the role of certain important nutrients in brain development and function. Georgieff argues that deficiencies in some nutrients can cause brain dysfunction not only during the time of deficiency but long after repletion. Awareness of the role of nutrition in brain development and brain functioning is important for developing and supporting policies and programs to improve the nutritional status of pregnant women, newborns, and children.

The first section of this volume concludes with an overview of children and dental care by epidemiologist Cheri Rolnick. She summarizes the literature on oral health in children as well as the relationship between oral health and child outcomes. Children from poorer families have worse oral health than their more advantaged peers, and research suggests a connection between oral health and school performance that appears to operate in part through increased absences of children with dental problems.

Part II of the volume focuses on the effects of health interventions on child development and outcomes throughout the life course. Sai Ma, Kevin Frick, Alyssa Crawford, and Bernard Guyer contribute a chapter on early childhood health promotion and its health consequences over the life course. The authors explore whether health promotion efforts targeted at preschool-age children can improve health over the lifespan and generate higher economic returns to society. They review a large literature on health promotion and provide a comprehensive update of an earlier study for the areas of tobacco exposure, unintentional injury, obesity, and mental health. Given that these four areas are the early antecedents of significant health problems across the lifespan, the authors conclude that the evidence is especially strong that health interventions to reduce tobacco exposure and the prevention of injuries are especially deserving of public attention.

Katina D'Onise, Robyn McDermott, and John Lynch provide an overview of the literature connecting early childhood interventions to improvements in child and adult health. This chapter is based on two

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earlier reviews by the authors on the effects of preschool on child health outcomes and on adult outcomes. Notably, the findings from the research synthesis indicate that health improvements are more likely to result if the preschool intervention is comprehensive and especially if a parenting component is part of the intervention. Improvements in child and adult health are observed even if the preschool intervention did not explicitly include a health services component. The chapter concludes with an especially detailed discussion of the limitations in the existing studies.

Following the research synthesis by D'Onise et al. on the role of early childhood interventions in promoting health, Karen Bierman, Robert Nix, Celene Domitrovich, Janet Welsh, and Scott Gest focus on a specific intervention offered in Head Start centers. The Head Start REDI (Research Based, Developmentally Informed) project was designed to determine the feasibility and effects of enriching Head Start programs with a comprehensive set of evidence-based curriculum components that target social-emotional as well as emerging literacy skills. One of the important components of the REDI project is professional development for teachers. Analysis of study findings from a randomized control trial suggests that the REDI intervention has effects on important child outcomes that include better self-control, better problem solving skills, and reduced aggression.

Catherine Ayoub, Jessica Dym Bartlett, Rachel Chazen-Cohen, and Helen Raikes discuss the impacts of Early Head Start for families experiencing parental mental health challenges. Head Start programs are believed to positively affect children's development by protecting the family from stress and promoting positive relationships between parents and children despite the presence of stress. Ayoub and her co-authors present findings that Early Head Start protects parenting, child language, and self-regulatory development from the effects of parenting stress and socioeconomic risks. Early Head Start can serve as a buffer between the negative effects of parent mental health conditions including maternal depression and anxiety and isolation. The authors argue that early prevention and intervention programs that support parent mental health, improve socioeconomic status, and improve child-parent interactions are likely to be important tools in promoting positive child well-being.

Michelle Englund, Barry White, Arthur Reynolds, Lawrence Schweinhart, and Frances Campbell contribute an innovative and important chapter integrating findings from three major longitudinal studies of high-quality preschool education targeted toward economically disadvantaged children. Reynolds, Schweinhart, and Campbell are known for their lengthy, significant involvement in studies of the Chicago Child-Parent Centers, the HighScope Perry Preschool