Part III
Education and Opportunity

Chapter 8
Gates, Gaps, and Intergenerational Mobility: The Importance of an Even Start

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Abstract This chapter focuses on how intergenerational mobility is affected by children's earliest life experiences from conception through preschool. These experiences are important because of their effects on outcomes later in life. One consequence is that intervening early is the most cost-effective way to put a child on course to pass through the gates that determine adult success and thereby reduce differences in mobility among children born in different circumstances. Using a life-cycle model, we examine the evidence on trends in factors that affect child development. The evidence we assess leads to the conclusion that opportunity and mobility are declining for lower and even middle class children as changes in family life, parenting practices, economic inequality, unresponsive social institutions, and increasingly economically homogeneous neighborhoods all point to a serious decline in the factors that are associated with greater mobility. We conclude that the decline in opportunity and mobility for current generations of American children is likely the biggest negative effect of the continuing U.S. inequality boom in income, wealth, and consumption. The paper ends by outlining a series of policies that would help restore opportunity in America by intervening early in the life course.

Keywords Intergenerational mobility (IGM) • Dynamic complementarity • Economic opportunity • Childhood outcomes • Human capital • Life-cycle model • Early childhood education • Childcare • Maternal health • Health care • Health insurance • Socioeconomic status (SES) • Unmarried mothers

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Introduction: How Can We Make the Start More Even?

Efforts to address economic opportunity are not enough as we seek to improve American society. That's because addressing economic opportunity does not deal with another problem: a lack of intergenerational mobility (IGM). Without more widespread opportunities to improve childhood outcomes and do a better job of building human capital for all children, we are not likely to see a systematic increase in relative social and economic intergenerational mobility—movement up (or down) in socioeconomic class within a family from one generation to the next (see, for instance, Jencks and Tach 2006; Smeeding 2015).

Policy makers concerned about IGM need to think about how to overcome barriers in order to create more opportunity for those left behind and how to make greater opportunity translate into more mobility. In the parlance of the *Opportunity in America* project, we need to open more gates to opportunity for more children. And we need to reduce the gaps in successful outcomes between the children of the haves and have-nots, with the latter passing through key transition points with positive momentum instead of confronting closed gates at each point, falling further and further behind.

To guide our analysis, we need a framework to map out progress in reducing barriers that inhibit equalizing opportunity and IGM. The traditional literature on IGM does not help us much in this task. Most scholarly discussions of IGM focus on the question of income mobility for children once they have reached adulthood. Some of these studies tell us overall mobility has not declined in recent decades, which is unsurprising for an economy where income gains were widespread and living standards rose across the distribution up until the early 1980s (compare Mazumder 2015 and Smeeding 2015 with Chetty et al. 2014). We also know from national and cross-national research that there is substantial "stickiness" at both the top and bottom of the U.S. IGM matrix of parental and child incomes, with about 35–40 % of children that start in families at the top or the bottom of the heap ending up there as adults (Jäntti et al. 2006). Finally, we know that the resource levels separating the poor from the rich have grown in magnitude since the inequality generation was born in the 1980s, meaning that even with constant mobility, the consequences of ending up at one end or the other of the adult outcome distribution are much greater now because the dispersion in outcomes is much wider due to growing inequality in income and wealth.

If we are to advocate for policies to enhance opportunity and improve IGM for the next generation, we need to look at the factors affecting today's and tomorrow's children's chances at upward mobility, both in a relative and an absolute sense. A life-cycle approach begins to do this by setting up markers of success along the road to greater IGM from conception onward. By viewing IGM from this perspective, we are able to observe factors that increase or decrease equality of opportunity and mobility, and therefore, those that affect gates and gaps. These include both policies and institutions that open or close gates, and actions and choices made by individuals

that either help to reduce opportunity gaps for themselves and their children or have the opposite effect—to widen them.

In this chapter, I focus on just a few steps along this continuum but the ones that I believe are the most important—those earliest in life. Increasingly, scientific evidence on child development and success focuses on the very earliest developmental periods (Aizer and Currie 2014; Mazumder et al. 2010). Thus we argue that worrying about a child's chances of success in life by starting with preschool is not starting too early but rather at least two or three steps too late. Indeed preschool is the final step along the life cycle that we address in this chapter.

We begin by asking what makes a difference early in life. We consider just a sample of the evidence on child differences by social and economic origin that is accumulating in all social and behavioral science fields, as well as the brain sciences. We then review recent changes in the five most important factors that propel or hinder progress at early (and later) life stages: family structure and stability; parenting practices; economic inequality; social institutions; and neighborhoods and the role of place. These factors interact with one another and together strongly influence both opportunity and mobility. We also discuss how these dynamics will be playing out in a very different world, one in which there is no racial or ethnic majority but ever-larger numbers of children of color.[1]

The goal is to produce a healthy, active, curious, happy, and engaged child for the first day of elementary school. With this in mind we examine how children are affected by these forces in three early life stages: prenatal and family birth status; early home life, health, and childcare during ages 6 months to 3 or 4 years; and family life, neighborhood, and preschool during ages 4–6. Evidently, there are large gaps in outcomes related to school readiness that are systematically linked to the contextual factors listed above. In particular, we need to determine if the gap between the top and bottom of the child well-being distribution has narrowed or widened along this path. Finally, we will conclude with some suggestions on policy levers that can increase the chances of success for children born to disadvantage.

Throughout the chapter, we must ask what the "proper" roles of government are and society is in this process. How might we target public investment in children's (and in some cases their parents') development—in their education, health, safety, and so on—to compensate for lower private investment and less capable parenting? Resources can play a significant role at strategic transition points in the life cycle (i.e., places where more investment on the part of parents or institutions can make a big difference in children's outcomes). Some come early and are addressed here, such as parent-child interactions and the development of cognitive skills and character (grit, social competency, perseverance, and good habits), while others come later in life. The latter include schooling choices, paying for college, providing funding to enable acceptance of an unpaid internship, direct job provision in family firms (nepotism), or helping a first entrance into the housing market. But in all cases, disparities in child outcomes appear at the earliest stages of life. And there is

[1] See, for instance, Frey 2014 and the section entitled "The 5 Big Factors That Determine Early Development."

ever mounting evidence that the early childhood period, when the brain is most malleable, is the time where interventions for at-risk children might be most cost-effective (Heckman and Mosso 2014).

The scope of this investigation includes not only the poor but also the lower middle class. Stagnant earnings and flat or falling incomes, such as those that most workers are now experiencing, suggest that the barriers we identify are a worry for strapped middle classes, not just poor families with children (Shapiro 2015). There is a need for wages and incomes to rise in real terms for those now in the middle class. There is a difference between making a life on a poverty budget that provides just enough to barely shelter, feed, and clothe one's children, and one that is based on a budget sufficient to support a "well raised" child. In this regard, the important issue of the split in these costs between parents/families and the public sector and even the private sector arises.[2] Hence mobility is an issue for middle class families, not just the poor.

The present study is not simply an academic one: Opportunity and social mobility are growing popular and political issues. The belief in the opportunity to reach the American Dream is being seriously questioned today.[3] It once was a strongly and widely held view that if you worked hard and played by the rules, you could get ahead in America. But that has changed. Today, only 42 % of Americans agree that if you work hard, you'll get ahead, while just less than half (48 %) believe that was once but no longer true. Also notably, less than one-third of Black Americans believe that hard work gets you ahead, while one-seventh never believed this was true. Indeed, flat incomes indicate hard work and recovery from the Great Recession have not yet paid off for the middle classes.

More to the point for IGM analysis, most Americans (55 %) believe that one of the biggest problems in the country is that not everyone is given an equal chance to succeed in life. And according to Galston (2014), other recent surveys have shown the same result— parents' confidence in their children being better off than they are is at or near the lowest point ever recorded:

> (W)hen the August 2014 NBC/WSJ poll asked "Do you feel confident or not confident that life for our children's generation will be better than it has been for us?", only 21 percent expressed confidence, down from 30 % in 2012. During the same month, the CBS poll asked, "Do you think the future of the next generation of your family will be better, worse, or about the same as your life today?", only 23 % responded "better" compared to fully 50 % who said "worse."
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> In June, CNN/ORC found that only 34 % of respondents believed that most children would grow up to be better off than their parents, while 63 % expected the children to be worse off. And the Heldrich Center at Rutgers' Bloustein School found in August that only 16 % of Americans expect job, career, and employment opportunities to be better for the

[2] Kirkegaard (2015) suggests that public finance support for U.S. children is amassed mainly in the tax code and therefore supports rich children much more than poor ones. Absent changes in federal funding to favored new investment in children, new methods to pay must be found. The new institution of Social Impact Bonds (SIBs), where the public sector pays back private investments in outcomes that reduce future public costs, might help in such instances. For more, see Liebman (2011) and Costa (2014).

[3] Data collected in July and August 2014; Jones et al. 2014.

next generation than for the current generation, compared with 40 % in November of 2009, just months after the official end of the Great Recession (Galston 2014).

And families are not just imagining retrenchment, they are living it. A recent Brookings Institution report (Shapiro 2015) notes that in 2000, 16 % of households were headed by people without high school diplomas, and an additional 51 % were headed by people without college degrees. From 2002 to 2012, the median income of the group without high school diplomas declined at an average annual rate of 2.4 % across age cohorts year after year; the median income of the group without college degrees fell at an average annual rate of 1 % across age cohorts year after year. That tells us that two-thirds of American households have suffered persistent income losses from 2002 to 2012, a period that included eight years of economic "expansion" and two years of serious recession.

Overall then, it appears that most Americans express significant concerns about the economic future of their children and themselves. But they also are questioning their beliefs in America being an equal opportunity society, a principle widely thought by many to be our highest social value.[4] Restoring opportunity in America has to become an important and continuing national priority.

What Makes a Difference Early in Life?

In this section, we introduce the life-cycle model. We then provide a brief review of what we know about early influences on health, behavior, and learning, establishing the following:

- Child development starts at conception, influenced by prenatal health and intrauterine environment, and these factors have important longer-term effects, according to evidence from test of the fetal origins hypothesis.
- Brain development differs between rich and poor children from conception onward.
- Health status, health care access, and parenting are the keys to successful early child development (after birth but before formal preschool).
- Poor health and bad birth outcomes make it harder for such children to catch up with others as life progresses according to the "dynamic complementarity" hypothesis.
- Difficulties persist in providing high-quality preschool experiences for poor children.

[4] "[Only] in America is equality of opportunity a virtual national religion, reconciling individual liberty—the freedom to get ahead and 'make something of yourself'—with societal equality. It is a philosophy of egalitarian individualism. The measure of American equality is not the income gap between the poor and the rich, but the chance to trade places" Reeves (2014).

Gates and Gaps and the Life-Cycle Model

In a recent pair of cross-national research volumes, the authors and editors took the life-cycle approach to studying the relationship of parental education and income to child outcomes from birth to age 30 (Smeeding et al. 2011a; Ermisch et al. 2012). Figure 8.1 summarizes their model of the process from birth to adulthood for one generation, moving across six life stages from origin (parental socioeconomic status, or SES) to destination (children's adulthood SES). Parental investments and social institutions affect each step, where intermediate gains or losses are measured in multiple domains.

This structure allowed us to combine evidence from different cohorts at different times, with every outcome in every country being ranked by adult educational differences. Taken as a whole, these studies suggest a powerful effect of parental SES on child outcomes in health, cognitive testing, sociobehavioral outcomes, school achievement, and adult social and economic outcomes. Examination of standardized outcomes across 11 countries found a definite and universal pattern: the higher

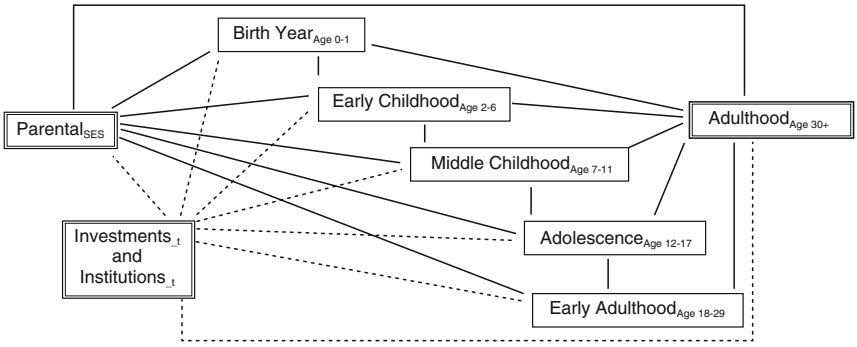

Table A. Variable Definitions and Examples of Proposed Measures at Different Points in the Life Course

Parental SocioEconomic Variables (Parental$_{SES}$) *Measures:* Education, Income, Earnings, SES, Occupation, Wealth, Employment
Childhood/Early Adulthood Life Stages Birth Year (age 0-1), Early Childhood (age 2-6), Middle Childhood (age 7-11), Adolescence (age 12-17), Early Adulthood (age 18-29) *Measures*: Educational attainment, cognitive measures, socio-emotional behavior, employment/labor market, health/physical
Investments $_t$ and Institutions $_t$ Are assumed to be different public and private investments and institutions contributing to children's development that vary by country.
Adulthood (Age 30+) *Measures*: Child SES, Income, Education, Employment, Labor Market Attachment

Fig. 8.1 A model of intergenerational transmission of advantage by life stage (Ermisch et al. 2012)

the adult SES as measured by educational attainment, the larger the positive effect on children's outcomes as they crossed each transition point.

The gaps among children ranked by parental education were observed from birth onward and did not diminish as they got older. Although in some cases the gaps widened, this was not always the case. Notably, the slopes of the relationships between parental SES and child outcomes were most steep in the United States.[5]

The same structure facilitates the assessment of how various cohorts of United States children will be affected by growing gaps in parental SES (education, earnings, wealth, and income). In this chapter we concentrate only on the first two stages in Fig. 8.1: conception and birth through early childhood.[6]

What We Know about Early Influences on Health, Behavior, and Learning: A Very Brief Review

Child development starts at conception. The fetal origins hypothesis first suggested by Barker (1995) hypothesizes that pre-birth experiences have long-term effects on health. Ever mounting evidence suggests that maternal impoverishment during the prenatal period has a substantial causal impact on infant health and long-term outcomes (Aizer and Currie 2014). Behaviors (smoking, drinking, substance abuse—each holding other factors constant) and exposure to toxins all exert a negative influence on in-utero child health, full-term birth, birth weight, and early child well-being (Lien and Evans 2005). Exposure to harmful environmental factors such as pollution, violence, and stress also take their toll on mothers and children alike (Currie et al. 2009; Currie and Walker 2011). Nutritional and health effects in-utero are also important to long-term outcomes for children—the findings of multiple studies suggest the growing importance of such effects (Mazumder et al. 2010, 2015; Almond and Mazumder 2011; Almond et al. 2012; Almond and Currie 2011).

Mothers born in a high-disease environment were also more likely than other women to have low-birth-weight offspring and to be suffering from diabetes when they gave birth, suggesting a strong intergenerational environmental component to poor health (Almond et al. 2011; Aizer and Cunha 2012; Smeeding 2015). Disadvantaged women also have greater exposure to, and are more susceptible to, contagions such as seasonal influenza. Hence, they may be disproportionately affected by pandemics which, in turn, can negatively affect fetal development. There are a number of factors that can potentially explain disadvantaged women's greater susceptibility. These include that disadvantaged women are more likely to

[5] But not all the steps were filled in for any one country, save Sweden, where the paper by Mood et al. (2012) covers all the steps in the life course. In the larger study, most outcomes were measured for only one cohort. For more, see Ermisch et al. (2012), especially Chap. 2.

[6] In this review we draw heavily on recent reviews of the child development literature by Aizer and Currie 2014; Magnuson and Duncan 2014; Heckman and Mosso 2014; Duncan and Magnuson 2013.

live in crowded homes, are more reliant on public transportation, are less able to stay home from work when ill, are less likely to be immunized, and are less likely to believe the influenza vaccine to be effective (Wooten et al. 2012; Sanders 2012; Quinn et al. 2011). Finally, women who are poor, minority, or both are also more likely to be the victims of domestic violence (Vest et al. 2002). The literature on maternal health, exposure to toxins and the like, and poverty strongly suggest that from conception through birth, children from lower-income families are at a disadvantage in comparison to those born to higher-income families.

Moreover, there is evidence that poor birth outcomes and low birth weight have effects that are liable to persist through childhood and even into adulthood. In a recent paper, Figlio and colleagues (2014) find that the effects of poor neonatal health on adult outcomes are largely determined early in life and continue for all births to rich and poor families alike and to families at all levels of educational attainment (Figlio et al. 2014). However, children with poor neonatal health born to highly educated families perform much better in the longer run than do those with good neonatal health born to poorly educated families, suggesting that patterns of nurture and early child development can at least partially overcome poor health at birth. Their findings are very much in keeping with the literature on the positive relationship between household income and health status in childhood and adulthood (Hoynes et al. 2012; Dahl and Lochner 2012) and are consistent with the notion that parental inputs and neonatal health are complements rather than substitutes, a "dynamic complementarity" that we return to below.

Recent research has focused on understanding how environmental experiences, including stress and poverty, affect the underlying neurocognitive, biological, and physiological processes of development. This phenomenon is often referred to as the way that "poverty gets under the skin." About five years ago, early research identified abnormal levels of, and fluctuations in, cortisol (the "stress" hormone) as the primary underlying mechanism (McEwen and Gianaros 2010; Champagne and Mashoodh 2009; Seeman et al. 2010). More recently, given that stress-related, elevated levels of cortisol in the mother can affect the placenta, researchers have focused on the potential negative effects of maternal stress on fetal outcomes. Comparisons of siblings suggest that those who were apparently exposed to higher-than-average levels of cortisol in utero have lower IQ levels at age 7 and complete one less year of schooling (Aizer et al. 2012). In some recent studies, environmental experiences are linked to individual differences in developmental outcomes through stable and permanent changes in genetic expressions (Essex et al. 2013).

Although genetic endowments are largely invariant during development, there is considerable change in the epigenome—the biochemical system that regulates gene expression. Moreover, the epigenome has been found to be particularly responsive to environmental conditions, including poverty directly (Hanson et al. 2013; Essex et al. 2013; Boyce 2012; Sameroff 2010). Research has also found that early maternal stressors are related to epigenetic changes in their children during adolescence, with implications for their mental health (Hanson et al. 2014; Knudsen et al. 2006; Shonkoff et al. 2012). Finally in a recent study of great importance, Noble et al. (2015) provide the strongest evidence to date that socioeconomic disparities,

particularly in income, are associated with large differences in cognitive development. Investigating patterns in brain structure across social and economic status, they found that children from lower-income families had relatively large differences in brain surface area in comparison to children from higher-income families, likely predictive of future differences in cognitive development.

Postpartum health and development (but prior to pre-preschool) is also important for child outcomes (Beller 2009). Several studies have documented the relationship between the amount and type of speech directed at a child by caregivers during the course of a typical day and the child's later expressive language and vocabulary (Weisleder and Fernald 2013; Rowe 2012). Studies of parenting and children's self-regulation also point to associations between parents' early support of their children's autonomy with later assessments of children's executive function (Landry et al. 2006; Bernier et al. 2010). Because higher-income parents are typically better educated and also have more money to invest, their children tend to have better outcomes than children of lower-income parents (Guryan et al. 2008; Yeung et al. 2002; Kaushal et al. 2011). Further, child-parent interactions, such as those outlined above, may be more productive for children born healthier. In other words, prenatal and postpartum investments may be complementary in producing better child outcomes (Bono et al. 2012; Hsin 2012).

In fact, research on the malleability of cognitive and language abilities shows these skills to be highly responsive to both positive *and* negative influences (Fox et al. 2010; Shonkoff 2010). In effect this suggests that newborn health and postnatal investments are complementary. This hypothesis, termed "dynamic complementarity," implies that the impacts of general parental investments, as well as early childhood education on child outcomes, will be greater for children who enter the preschool period with higher levels of cognitive and socioemotional skills (Aizer and Cunha 2012). In particular, preschool settings that are designed to expose children to sensitive caregiving environments should increase children's socioemotional skills much more among children with more sensitive caregivers in their home environments (Duncan 2014). This process of dynamic complementarity is still just a hypothesis, and one whose negative effects can be overcome by consistent, strong investments in children from the beginning of their lives, even for the most disadvantaged children (Cunha and Heckman 2007, 2008; Camilli et al. 2010; Heckman and Mosso 2014).

Thus, despite some uncertainty, the available evidence suggests that the consequences of initial health disadvantages associated with being born to a poor mother are likely to be exacerbated over time without intensive policy and practice interventions. Unfortunately, children with poorer initial health endowments typically receive fewer postnatal investments, and the investments they do receive may be less effective due to dynamic complementarity. This mechanism can explain not only the considerable persistence of in-utero conditions in later-life outcomes, but also why the long-term impact of low birth weight is greater when children are born into poverty and other unsatisfactory circumstances (Figlio et al. 2014). In terms of the framework of this project, early gaps can easily become larger and increasingly

more difficult to reduce. However, continuous investments before the preschool period can still make an important difference in outcomes.

Preschool Investments

The life-cycle model leads us to the topic of preschool and its effectiveness. Although about 70 % of children overall have attended a preschool-like program, the rate is much higher among the top two quintiles of the income distribution (nearly 90 %) than among the three bottom-income quintiles (65 %) (Duncan and Magnuson 2013; Magnuson et al. 2012). Currently, about 25 % of children do not attend preschool at all before they enter kindergarten, while some unknown fraction of children are privately reared in strong developmental childcare and early education systems from ages 1 or 2. Because lower-income children are least likely to be enrolled compared to higher-income children, and because income gaps in early development forecast lower levels of human capital accumulation, improving enrollment and attendance for low-income children should be a first priority for policy.[7] But in this area, the United States pales in comparison to other nations. According to the Organisation for Economic Co-operation and Development (OECD 2015, chart PF3.1.A) public expenditure on childcare and early education services was less than 0.5 % of GDP in 2011, placing the U.S. last among rich OECD countries in such efforts. Surprisingly, African-American children are, if anything, more likely than comparable White children to be enrolled in school- or center-based care at age 5, though often of lesser quality (Magnuson et al. 2006; Magnuson and Waldfogel 2005).

Any discussion about preschool for disadvantaged children must begin with the much maligned, but currently irreplaceable, Head Start program, the oldest and largest federally funded preschool program in the United States. Head Start not only provides early childhood education, care, and services for children but also tries to promote parental success. Although recent critical federal evaluations suggest that the effects of Head Start on learning and cognitive outcomes begin to fade in the second grade and later disappear, others defend the program as having positive longer-term outcomes for children and parents (Duncan and Magnuson 2011).

For instance, employing a quasi-experimental design, Sabol and Chase-Lansdale (2015) examined whether children's participation in Head Start promoted parents' educational advancement and employment. They found that parents of 3-year-old Head Start children had steep increases in their own educational attainment by the time the child was 6, with strong effects particularly for African-American parents.

[7] We also note that there are other demographic groups that have comparatively low levels of preschool enrollment—Hispanic children and children of immigrants. No doubt, part, but not all, of the lower rates of enrollment can be attributed to their families having lower incomes. But both language barriers and cultural factors are also likely influences that play a role in the lower levels of enrollment among Hispanic children and children of immigrants (Takanishi 2004).

Further, Head Start centers offering full-day service boost cognitive skills more than other centers, while Head Start centers offering frequent home visits are especially effective at raising noncognitive skills in children and adults (Cunha and Heckman 2008; Cunha et al. 2010; Walters 2014). Carneiro and Ginja (2014) provide new estimates of long-term impacts of Head Start on health and behavioral problems, suggesting that participation in the program reduces the incidence of behavioral problems, health problems, and obesity of male children as teens, lowers depression and obesity among adolescents, and reduces engagement in criminal activities and idleness for young adults.

What skill development strategies will likely have the greatest payoff in preschools? Heckman and colleagues[8] have continued to establish that we need to better understand the mechanisms through which successful early childhood programs work. And their evidence suggests those that appear to work best affect the so-called "soft skills," social and behavioral outcomes such as character building, self-control, and conscientiousness, in comparison to cognitive skills which often fade out early in elementary school (Heckman 2012; Kautz et al. 2014). For instance, those young children and their parents who practice small acts of self-control find it easier to perform big acts in times of crisis. Quality preschools and parenting coaches have produced lasting effects by encouraging young parents and students to observe basic etiquette and practice small but regular acts of self-restraint (Roberts et al. 2014).

Simple things like showing up also matter. Research from the Consortium on Chicago School Research at the University of Chicago suggests almost half of 3-year-olds and more than a third of 4-year-olds enrolled in pre-K are "chronically absent"—defined as missing more than 10 % of days—from Chicago's pre-K program and, further, these absences are strongly correlated with negative outcomes in elementary school learning (Ehrlich et al. 2013). Such findings reinforce the connection between health and learning and, in particular, the dynamic complementarity of bad health and poor early childhood education outcomes as the child transfers from preschool to elementary school.

The most encouraging news is that there are successful models of preschool on which to build. One example of a public preschool program that has developed exemplary curricula by integrating proven literacy, math, and social skills interventions and then implemented them, is the Boston Pre-Kindergarten Program (Duncan and Murnane 2013). Rigorous evaluation reveals large impacts on vocabulary, math, and reading but smaller impacts on executive function (Duncan and Murnane 2013; Weiland and Yoshikawa 2013). Another is Chicago's Child Parent Center education program. This program engages not only with the children but also with their parents to foster better learning at home and to help families address the myriad challenges they face. The program comprises a dedicated parent resource teacher and a school community representative who engage parents both inside and outside the program. Students who participate in the program are better prepared for kindergarten, perform better on standardized tests, are less likely to need special education

[8] Heckman et al. 2013; Heckman and Mosso 2014; Heckman and Kautz 2014; Kautz et al. 2014.

services, and are more likely to graduate from high school and be successful in life (Chetty et al. 2011). The program is now funded in the Chicago area by a series of Social Impact Bonds, where the public sector pays back private investments in outcomes that reduce future public costs (Costa 2014).

In summary, we are finally coming to understand the importance of maternal and child health, as well as maternal behaviors related to poverty, substance abuse, bad neighborhoods, stress, pollution, and domestic violence. Together these toxic ingredients make a powerful negative cocktail of dynamic complementarity that is hard to overcome without strong and continuous interventions as a child moves from birth through preschool. Further study and examination of evidence on child outcomes are beginning to tell us not only what conditions matter, but also what treatments appear to offer effective counterweights. To reduce disparities in opportunity, we must take advantage of these findings.

The Five Factors That Determine Early Development

Here we briefly review five separate, but often highly intercorrelated, factors or forces that influence child development and, ultimately, IGM by determining whether the gates to opportunities are open, slightly ajar, or closed for the child. Unless we are able to counter the distributions of advantage and disadvantage that are influenced by each of these factors, we will not be able to meaningfully increase opportunity or mobility for those children born to disadvantage. We begin with the two most closely related factors: family structure early in life and parenting. These are followed by economic factors (money), social institutions, and neighborhoods.

Family Structure

Family formation and parenting practice are treated together, as they are often highly intertwined and because they matter a great deal from a child's earliest days through adolescence and beyond. Many analysts believe that family composition and stability may matter even more than income for equality of opportunity and IGM. As McLanahan and coauthors (McLanahan 2014; McLanahan and Jacobsen 2013) and Cherlin (2014) have established, we are seeing a growing parental class divide in America—in income, education, neighborhood, and especially family formation.

Children born into continuously married families have much higher economic mobility than those in single-parent families, especially those headed by unmarried mothers. In this regard, we must recognize the long, steady decline of marriage. In 1960, only 12 % of adults aged 25–34 had never married; by the time they were 45 to 54, the never-married share had dropped to 5 %. But by 2010, 47 % of Americans 25–34 had never married, and based on present trends, their share will be about

25 % in 2030 when they're 45–54 (Wang and Parker 2014). This is a stunning decline that befuddles demographers and social policy wonks alike. The growth in the number of single unmarried mothers in the United States has both been massive and concentrated among the least educated (no high school degree), as well as those, especially in their 20s, who have graduated high school and even may have some postsecondary education. These women are typically more educated than the men who fathered their children and do not want to marry men who do not have an education or regular jobs. Some scholars believe that changes in the labor market have been particularly important in reducing the marriageability of undereducated men (Wilson 1996). Others argue that incarceration and street violence have drastically reduced the numbers of Black men who are eligible for marriage.[9]

Because family differences begin at birth, it is often useful to characterize the middle ground of an issue by looking at the extremes. If we examine both what is considered to be the best and the worst ways to become a parent, we can better understand the genesis of "diverging destinies" (McLanahan 2014; McLanahan and Jacobsen 2013). The "best" way to become a parent is through living the American Dream. The process is the same for men and women alike: Finish school, find a decent job, find a partner you can rely on, make plans for a future together including marriage as a commitment device (see Lundberg and Pollak 2013), and then have a baby. Following this path will likely mean that parents are age 25 or older, more educated, and more likely to have a stable marriage. They have better parenting skills and smaller families, along with more income, auxiliary benefits, and assets to support their children. For their children, these characteristics translate into open gates for opportunity.

At the other extreme, the step "have a baby" (between the ages of 16 and 22) moves to the top of the list, preceding all the other steps. These parents typically have not finished school, do not have a steady or well-paying job, do not have a stable marriage or steady partnership, and likely never had a plan. They have less education (high school or less), are younger and less skilled, and have lower wages and fewer benefits and more multipartner fertility. The result of this personal choice is less social and economic stability, as well as fewer resources and opportunities for their children (Smeeding et al. 2011b; Carlson and Meyer 2014; Smeeding 2015). For single women under 30, almost 70 % of pregnancies are also unintended (Sawhill 2014). And there is now strong evidence that unintended pregnancies produce poorer outcomes in children (Ibid.).

Changes in fertility/marriage, cohabitation/divorce, maternal employment, and maternal education are therefore reinforcing differences in income inequality (see below) and further reducing IGM among children. Perhaps the relationship between children and their mothers is the most important mechanism of how families affect development. Better educated women are more likely to obtain jobs with higher earnings and family leave benefits, allowing these mothers to invest more time and

[9] Justin Wolfers, David Leonhardt, and Kevin Quealy. "1.5 Million Missing Black Men," *New York Times*, April 20, 2015, http://www.nytimes.com/interactive/2015/04/20/upshot/missing-black-men.html?abt=0002&abg=0

money in their children. They are also more likely to have fewer children, and children born later in life. Mother's age at childbirth matters because it is a strong indicator of the child's future economic mobility.

Parenting

The quality of parenting is also highly unequal because of differences in parental endowments with respect to skills (type and amount) and economic resources (income and wealth). Hours spent reading to a young child or talking with a young child make a big difference in later outcomes. Soft skills such as conflict resolution or how to respond to setbacks are also usually better taught by those who have those skills—typically those with more education. And, of course, parental educational attainment is highly correlated with childhood education; high-skill parents not only realize the value of education but also make every effort to make sure their children succeed in reaching a high level of educational attainment.

Top-quintile spending on children's' enrichment (special classes, music, camps, and other experiences) is now almost $8900 per year, three times that of low-income quintile parents, who spend about $1320 on the same goods and services (Kaushal et al. 2011). These differences, confirmed in multiple studies, suggest that long before preschool, children born to highly educated and stable families acquire strong foundations in both cognitive and behavioral skills.[10] Using a composite measure of parenting quality,[11] researchers have established that the children of parents in the lowest quartile (lowest one-fourth) do worse on multiple outcomes at every stage of the life cycle in comparison to those born to the highest-quartile parents, with differences in success rates on the order of 30–45 % at *each* stage.

Economic Inequality: Money Matters—A Lot

There is a range of opinions about general trends in IGM, the trends in top-decile and bottom-decile income mobility, and the complicated relationship between income/wealth inequality and IGM. Nonetheless, almost all researchers agree that because differences in parental incomes between the top and bottom quintiles have grown substantially, the stakes for remaining at the bottom or the top of the distribution are now much larger, even with constant mobility parameters, because the rungs of the income ladder are much further apart. Figure 8.2 uses the Congressional Budget Office (2011) estimates of after-tax and transfer incomes for families with

[10] Readers should consult Kalil et al. 2012; Philips 2011.

[11] The Reeves and Howard (2013) parenting scale is based on Children of the National Longitudinal Survey of Youth "HOME" assessments at various life stages, which includes pictures, observation, interviews, etc., as well as information about literacy activities.

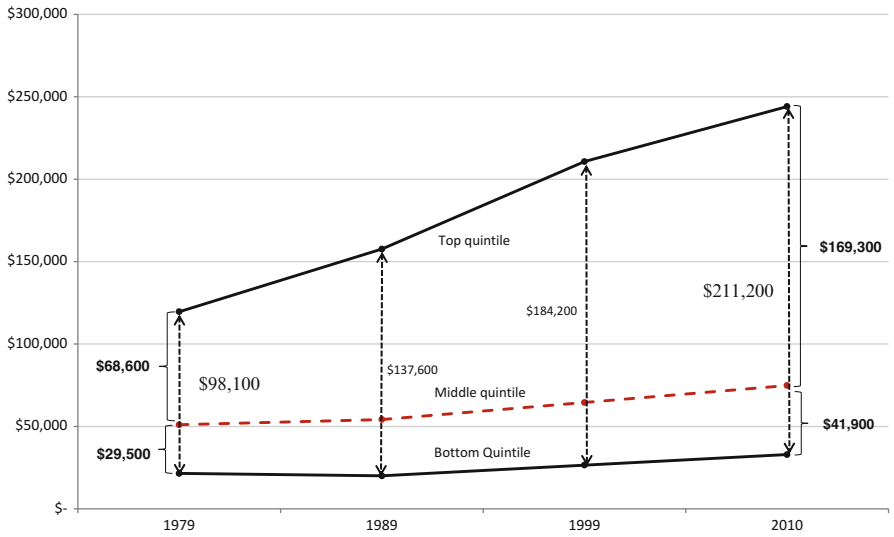

Fig. 8.2 After-tax and transfer disposable income for households with children: mean income in bottom, middle, and top quintiles, 1979–2010 (Source: Congressional Budget Office, http://www.cbo.gov/sites/default/files/cbofiles/attachments/44604-AverageTaxRates_Supplemental.xlsx)

children to show that the family income gap rose by almost $113,000, or 115 %, from 1979–2010.[12] This is a huge change across a fairly short time span.

This figure raises an important question: Should we be more concerned about relative or absolute mobility? The former refers to how children rank in terms of an outcome variable such as income relative to their parents' rank; the latter refers to the level of income that a child achieves and whether it is higher or lower than their parents' incomes (see Chap. 13). For example, do we care about absolute class gap or relative class gaps in child outcomes? In Fig. 8.2, both the top- and bottom-quintile children are better off in income terms in 2010 than in 1979, but the gap between them has widened. However, fully half of the gain in real incomes in the bottom 20th percentile is because of the increase in the cost of insured health care, which is assigned to the poor as income. Of course, the cost of health care insurance rises for the other quintiles, too, but is a much smaller fraction of their incomes and income gains (CBO 2011), hence overstating the income gains to the poor.

[12] Because of the growth in the very top income shares, how much is it driven by the top 1 % in any given year? If we use the mean of other percentiles to gauge the change at the top, then how much smaller or bigger are the differences between top and bottom? The gap between the bottom and the top, where the top is the 81st–90th, grows $48,900, or 49.9 %, over this period; the gap using the 91st–95th percentile as the top grows $68,800, or 70.1 %. And if the top is the 96th–99th percentile, the gap grows $115,000, or 117.2 %.

Further, Fig. 8.2 shows that middle class children[13] are losing more ground relative to top-end children than are those at the bottom relative to the middle. The top-to-middle gap has expanded from $68,600 to $169,300, or by over $100,000, from 1979–2010, while the middle-to-bottom gap rose from $29,500 to $41,900, or by about $12,400, over this same period.[14] It therefore appears that the top-end children are leaving the middle (and everyone else!) behind and helps explain why most "middle class" Americans worry about their children's future socioeconomic status, and why we see consistent calls for inclusive prosperity and shared growth (Summers and Balls 2015).

In a world where wages for most education groups are flat, as David Autor's (2014; Fig. 8.2) recent review of full-time workers makes clear, one finds that incomes and wages are stagnant or worse for undereducated men, not to mention relatively flat wages over the past decade even for men who are college graduates. This phenomenon also emerges for women since 2007 (Fig. 8.3). Even if women's wages at the bachelor's degree level have flattened since the Great Recession, women's rising wages over the longer term are in contrast to men's, except for the most educated men with post-bachelor's degrees. Beyond the diverging patterns of individual wages, the increase in assortative mating—whereby members of the same social and economic class are more likely to marry each other—substantially compounds income differences across families.[15] Evidently, these "mated" high-skill parents are at a substantial advantage in comparison to lower-income men or women who fail to marry or partner and have only a single income to support their families.

If anything, the Great Recession likely has made differences in wages and incomes much worse, as we see increasingly widespread differences in employment and wages by education and age, with income gains mainly above the bachelor's degree level, where the IGM correlation of parents and kids' education is highest (Fig. 8.3; Torche 2011). Cross-national research suggests that the premiums in pay for the highest educated are the largest in the U.S., meaning that the minority who attain a bachelor's degree and beyond do most well in the U.S. labor market compared to their lesser educated counterparts (Autor 2014; Blanden et al. 2014; Ermisch et al. 2012). Much of this difference comes from the lack of progress in educational attainment in the United States compared to other rich nations (OECD 2014).

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[13] Middle class children are those in households with the mean income of middle-quintile families with children.

[14] Again, the reader must be careful as most of the gains in the lowest income class over this period—just about half—can be attributed to including the value of Medicaid and the State Children's Health Insurance Program in the incomes of households with children, where the value of Medicaid is far above the willingness of these households to pay for it.

[15] One can perform this operation by combining the incomes of men and women at each education level in Figure 8.3, producing a perfectly assortatively mated outcome by educational attainment that looks much like Figure 8.2. McCall and Burke (2014) show that the combined earnings rankings of husbands and wives at the upper end is actually a total sum of 160–170 (where husbands and wives are ranked by earnings quintiles from 10 to 100).

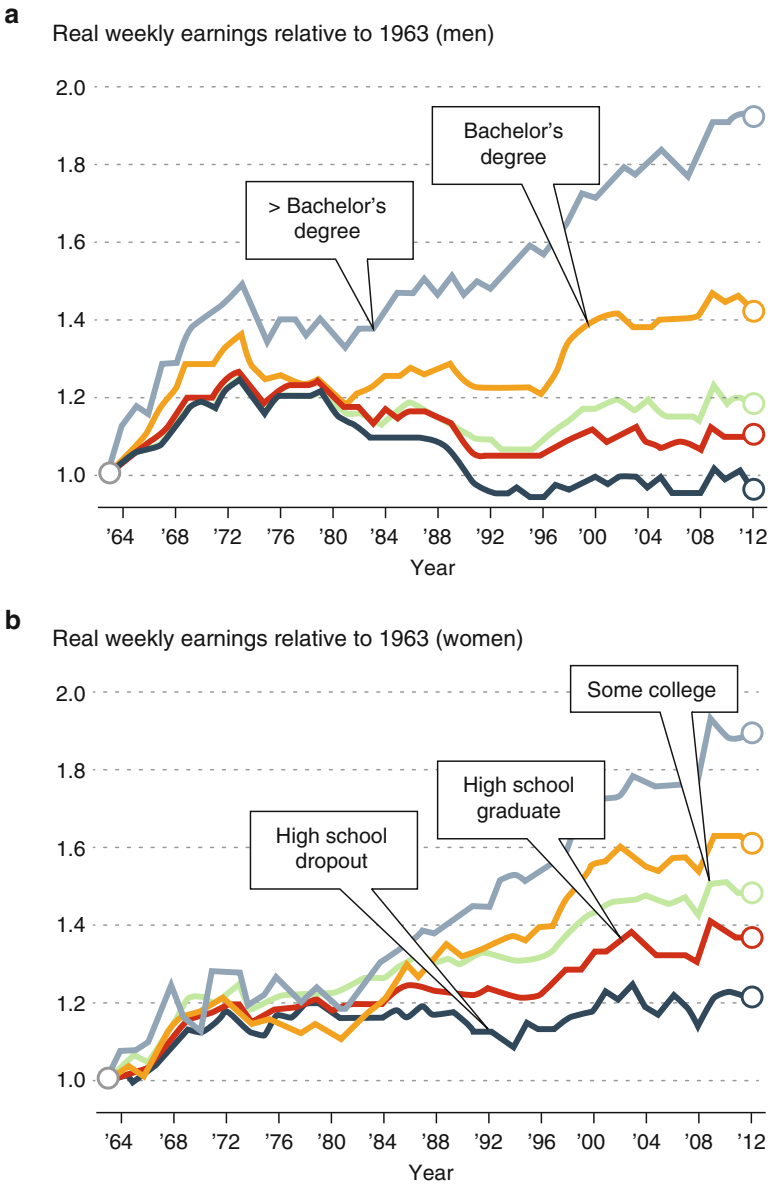

Fig. 8.3 Changes in real wage levels of full-time U.S. workers by sex and education, 1963–2012 (Reproduced from Autor 2014)

Of course, both earned incomes matter for all two-parent families. For families with children under 14, the United States has by far the largest number of two-parent full-time workers among the rich OECD countries. Nearly 60 % of children under 14 living in coupled households have both parents working full time in the

U.S., far more than in most other nations. For instance, German and Dutch couples with dual full-time earners represent less than 20 % of all two-parent working households.[16] But because of the Great Recession and the high rates of long-term unemployment that are still present, along with the disappearance of middle-wage jobs, maintaining steady full-time work is often difficult (Kenworthy and Smeeding 2014). Also, changes in housing markets and plant closings have led to a situation where, if one parent loses his or her job, the family is not able to move to another location due to the risk of selling their home at a loss or giving up the one remaining job that they have. In fact, the growth of low-wage service jobs since the Great Recession fits well with the U.S. having by far the largest number of workers who work weekends and evenings (Hamermesh and Stancanelli 2014). There is also evidence that median incomes rose from 1979, and especially from 2000 to 2007, in the United States due almost exclusively to added hours of work and not higher wages (Mishel 2013). These work patterns pose both economic and time costs on all parents who are also raising children, especially on single parents.

Although money matters, as we have established above, it is not just about income. Consumption and wealth also matter (Fisher et al. 2015). When one looks at the placement of children across the consumption and wealth distributions, we find that they are located in very different parts of the distribution compared to the positions of elders and childless adults. Children are overrepresented in the bottom half of all of these distributions, leading to concerns about their upward mobility, certainly in comparison to the minority of advantaged children who are located at the top of the wealth and consumption scales.

None of the current analyses of inequality or IGM have captured the full effect of net worth (assets, debt, and wealth) on consumption or income by considering all three measures of well-being simultaneously for the same households—although we know that each gives a different and important perspective on the distribution of economic well-being, and, most likely, a different outcome when considering the effects of inequality on IGM (Pfeffer 2011). For instance, recent work by Pfeffer and Hällsten (2012) and the Federal Reserve's Survey of Consumer Finances (SCF) (Yellen 2014) show that since 2001 (with wealth measured in early 2013), wealth inequality had increased and income inequality with it, especially at the top. And overall financial wealth has increased by 20 % since the time of both surveys, mainly to the benefit of those with the highest wealth levels. In particular, Pfeffer and Hällsten (2012) establish that the impact of parental wealth on children partly operates through its insurance-like effects for children (i.e., a "private family safety net"). Higher wealth creates the ability to purchase higher-quality childcare (e.g., a nanny), to afford higher-priced homes for better quality local preschools, or to pay

[16] OECD Family Policy Database 2014. Chart LMF1.1.A "Children in couple households by parental employment status, 2011," http://www.oecd.org/els/family/LMF_1_1_Children_in_families_by_employment_status_Jul2014.pdf

for tuition for private preschools.[17] Reeves (2013) and Smeeding (2014) refer to this as the "glass floor" effect, and it makes a difference from childbirth onward.

Social Institutions

In the United States, as in other rich nations, we are aware of a set of social institutions and social policies that are intended to ameliorate some of the differences in opportunity that come from differences in private incomes and wealth. The two most important are health care and public education (in the present case, high-quality preschools).[18] The major social institution that almost all children experience from conception through preschool is the health care system, especially the pediatricians and other health professionals who are a part of that system. The U.S. health care system does not yet provide high-quality care to all of its poor and middle class children. The availability of such care is especially important for children who are born with chronic exposure to toxins (e.g., lead), as well as parental smoking, alcohol, and substance abuse. Hence the children who would most benefit from high-quality, chronic-illness-oriented health care are the ones least likely to be receiving it. The passage and start of the Affordable Care Act may in time make a difference in patterns and continuity of care, but much can be done to improve it.

The second institution is the school system, including both subsidized and publicly provided early childhood education. The interaction between parental and child education has been studied at least back through Becker and Tomes (1979, 1986). Tests of their model by others (e.g., Solon 2014) have established that intergenerational correlations in socioeconomic status (or IGM) in later life can arise from the greater knowledge and financial ability of better-off parents to invest in their children's human capital, from children's genetic or cultural inheritance, or a combination of all.[19] Hence, in the opinions of many analysts, the schooling system, including preschool, often serves to reinforce existing patterns in IGM that are the consequence of differences in parenting, family stability, and parental education, as well as economic differences (Reardon 2011).[20]

[17] These differences also work well later in life to finance 529 college savings plans and pre-fund college with tax-free interest and capital gains, as well as the greater ability to do more for well-timed inter-vivos transfers, especially for the following generations. See Kirkegaard 2015; Fisher et al. 2015.

[18] For poor children, one might add the legal and child protective service system, the child support system, and the childhood disability systems, but they are beyond the scope of this chapter.

[19] Because these different sources of intergenerational status transmission produce similar empirical results, distinguishing the processes from one another is therefore a difficult task. But new research by Seshadri et al. (2014) presents a model of human capital accumulation that isolates the direct effect of parents' human capital on children's human capital and finds substantial evidence of strong parental spillover effect on children's educational attainment.

[20] Also Sean F. Reardon, "No Rich Child Left Behind," The Great Divide, *New York Times*, April 27, 2013, http://opinionator.blogs.nytimes.com/2013/04/27/no-rich-child-left-behind/

Finally, the methods by which health care and schooling are supported by public policy in the United States differ substantially from those in other developed nations. Instead of direct and universal open access to health care and preschool, we regressively subsidize these and other goods such as housing in good neighborhoods and college expenses using income tax subsidies that benefit the rich far more than the poor (Kirkegaard 2015).

Neighborhoods and the Role of Place

Neighborhoods and residential contexts clearly affect prospects for IGM. Previous research by Sharkey (2013) and others suggests that economic segregation can at least in part explain IGM patterns. School quality, exposure to community violence, elements in the physical environment (air pollution, noise, lead), and long-term exposure to neighborhood disadvantage can and do affect academic trajectories, child cognitive development, and later economic outcomes as seen above (Aizer and Currie 2014). For those living in a high-poverty neighborhood, the odds of falling down the income ladder as adults—being worse off than their parents—are 50 % on average, even for those children who have not grown up in a poor family. In other words, neighborhoods matter in terms of schooling and other attributes; structural clustering of disadvantages contributes to these factors reinforcing each other to produce bad outcomes, above and beyond the contributions of individual families' characteristics. In fact, a recent study by Chetty and Hendren (2015) concludes that "neighborhood effects are substantial, especially for children in low-income families. The county in which a child grows up explains nearly half as much of the variation in his/her earnings as his/her parents' incomes."

Declining manufacturing sector employment in inner cities, accompanied by the outmigration of Whites and the rising Black middle class in the 1990s and 2000s, left behind pockets of concentrated disadvantage (Wilson 1987, 1996; see also Chap. 2). From 1980 to 2010, economic segregation by neighborhood grew, while racial segregation per se changed by little. These poor and still racially segregated neighborhoods are characterized not just by high rates of poverty and crime, but also by high rates of unemployment, single parenthood, and multiple-partner fertility (Kneebone 2014). And while these neighborhoods were heavily populated by Blacks in the '80s and '90s, Murray (2012) shows similar patterns in formerly White middle class neighborhoods as well. Of course there are good urban neighborhoods, with clean parks and play spaces, new schools and childcare centers, readily available high-quality health care, and little crime. But these are largely occupied by well-to-do parents who pay housing and property tax prices to segregate themselves and their families (Brodmann and Massey 2014; Kirkegaard 2015).

The Changing Race and Ethnicity of American Children

There are stark differences in mobility rates for different racial groups, especially between Whites and African-Americans. Half the Black children growing up in families in the lowest income quintile remain stuck there as adults (51 %), compared to just one in four Whites (23 %) (Smeeding 2015). Mobility is also lower for Hispanic children than White children. Research on differences in mobility between Blacks and Whites reveal stark differences: On average, Blacks experience less upward mobility and Whites experience less downward mobility. In fact, Whites are on average 20–30 percentage points more likely to experience upward mobility than are Blacks. Mazumder (2014) finds that Black men raised in middle class families are 17 percentage points more likely to be downwardly mobile than are White men raised in the middle (38 % of Black men fall out, compared with 21 % of White men). A range of personal and background characteristics—such as parental occupational status, individual educational attainment, family wealth, and marital status—all help explain this gap.

We know far less about the mobility of ethnic minorities, especially immigrants, because they are not part of older panel datasets. For instance, the Panel Study of Income Dynamics and various National Longitudinal Surveys help assess IGM but are constrained by study and sample designs that began with the original adult samples in the 1960s or 1970s and followed their children, hence excluding all immigrant groups who have not "married into" the dataset, especially the large recent immigrant cohorts that are not captured at all (Duncan and Trejo 2015). What we know about Hispanic IGM, for instance, is sparse and, again, includes only those who emigrated before the recent immigration boom (see Duncan and Trejo 2015; Acs 2011). For instance, there is limited data about economic mobility among Hispanic families, who tend to have lower incomes compared to non-Hispanic Blacks and Whites but more stable family structures than do Blacks.[21]

Most importantly, perhaps, the racial and ethnic makeup of today's children is changing rapidly (Frey 2014). In 2011, for the first time, less than half of the children born in America were to two White Anglo-American partners. Soon most children will be minority children, including White Anglo children. By 2050, Anglo-Americans will be less than half of the population (compared to aging baby boomers, the vast majority of whom are White Anglo-American). Hispanics, Asians, and multiracial populations are expected to double in size over the next 40 years as the result of immigration, higher birth rates among minority populations already here, and more interracial marriages. While these changes will challenge the nation's legal, political, and economic systems, they are already beginning to affect the youngest of the emerging majority who are just now entering our school systems. Indeed one should not forget that the children whose mobility we are trying to improve early on are not likely to be White and Anglo-Saxon by heritage

[21] One more promising approach is for future studies to begin with the current population and trace back to find their parental heritage instead of the other way around (Grusky et al. 2015).

(Frey 2014). In succeeding decades, the combination of this explosion with the diminishing numbers of the White Anglo baby boomers will produce intergenerational competition over governmental resources (see Brownstein and Taylor 2014).

Using the Gates-Gaps Metaphor to Examine Opportunity and Mobility Early in Life

Having reviewed some of the evidence on the major economic, demographic, and social forces and factors that impede upward mobility for our youngest, most vulnerable children, we briefly return to the three life-cycle gates. Our goal is to examine the evidence regarding trends in the distributions of opportunity and of outcomes; that is, in comparison to earlier cohorts, have the distributions for very young children growing up in the twenty-first century become more dispersed (i.e., greater inequality) or more concentrated (i.e., lesser inequality)?

Remember that gates represent access (open gates) or obstacles (closed gates) to the opportunities to accumulate human capital and to have the possibility of upward mobility. We have divided the early life-cycle age span into three segments, with endpoints chosen to match critical transition points. Now we look at the gaps at each point to see if they are increasing, which would signal the cumulative widening of differences across children as they age. We pay attention here both to the gaps we find at each transition point and, where possible, the trends that may affect patterns in gaps for future generations.

Transition 1: Prenatal and Family Birth Status

The first step involves being born at a normal birth weight to a nonpoor, mature (partnered or, better, married) mother who has at least a high school diploma. While we know a little about trends in life quality at birth (Aizer and Currie 2014), we know from the diverging destinies literature mentioned above that 41 % of U.S. births are out of wedlock (vs. 11 % in 1970) and half of all births to women under 30 are out of wedlock (Hamilton et al. 2013). A majority of these births are unplanned as young adults "drift" into parenthood because of failed contraception or ambivalence about school and life goals (Sawhill 2014).

And for these parents, family complexity, defined here as having one or more children with someone who is not the birth parent of his or her earlier child, is greatest. Multiple-partner fertility leads to very unstable lives for children and adults, replete with communication and coordination issues across parents, complicated living arrangements, and much less available time for rearing of children (Carlson and Meyer 2014; Amato et al. 2014).

The facts are that marriage rates have fallen for all types of parents in their 20s, especially for White parents who, in earlier cohorts, were much more likely to marry by age 30 (Murray 2012; Cherlin 2014). But, somewhat surprisingly, the marriage rates for college graduates have held almost constant, along with relatively low divorce rates, over the past 40 years. This bifurcation in family formation patterns is a large component of the "diverging destinies" that young children face today.

Although never-married motherhood is rising among all women, we see in Fig. 8.4 that the fraction of never-married mothers with children under 18 is more than 20 % for those who did not graduate secondary school and 15 % for high school graduates, as compared to 3 % for those with a bachelor's degree or more. And these differences have been almost continually expanding over the past 40 years. Not only is out-of-wedlock childbearing highest among the least educated, but these births occur mainly to younger mothers, most of whom are poor or near poor, and most of whom have unstable living conditions in terms of both partners and living conditions (Edin et al. 2012; Tach 2015). Over their lifetimes, these mothers have more children per woman on average than the typical mother (Smeeding et al. 2011b). In contrast, well-educated parents have fewer children later (in marriage) under much better economic circumstances (McLanahan 2014; Sawhill 2014).

Looking at unmarried mothers by education group in Fig. 8.5, we can get at the differences in being raised by an unmarried parent. These figures suggest that out-of-wedlock childrearing almost has not changed at all since 1980 for college-educated

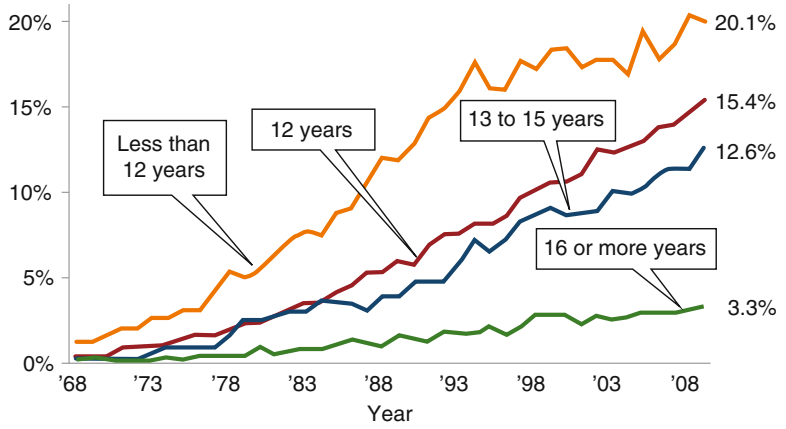

Fig. 8.4 Never-married mothers by education attainment (Source: Brookings tabulations of the Current Population Survey, Annual Social and Economic Supplement. Sawhill [2010], Fig. 10, 26; The *Economics of Inequality, Poverty, and Discrimination in the 21st century* by Robert S. Rycroft. Reproduced with permission of Praeger in the format Republish in a book via Copyright Clearance Center. Notes: The sample includes noninstitutionalized, civilian women ages 16–64 with a child under age 18 living in their house. Never-married mothers are those who have never been married)

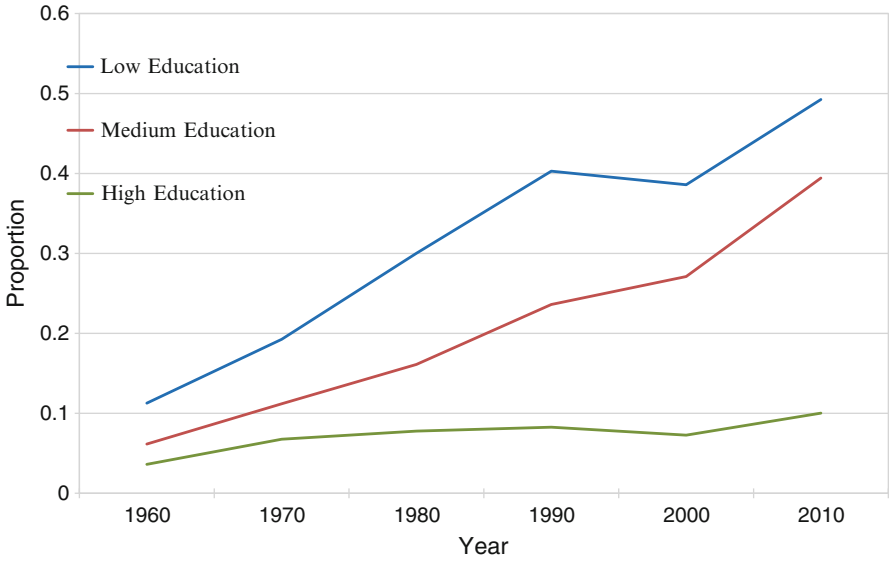

Fig. 8.5 Unmarried mothers by mothers' education (Source: IPUMS Census/ACS; Tach 2015)

(High Education) women, despite large increases among high school educated (Medium Education) and less educated (Low Education) women. These trends suggest widening differences and are not at all reassuring.[22] To be sure, the choice to have an unplanned child early in life handicaps both the parent(s) and the child, reducing absolute and relative mobility for both (Smeeding 2015).

Transition 2: Life at Early Ages, Post-Birth but before Preschool (6 Months to 3–4 Years)

In the face of low levels of education, instability, and meager income, most young single parents, including cohabitating mothers, live stressful lives that are neither good for themselves nor for their children (Aizer and Currie 2014). Various studies document that time spent with young children in reading and personal interaction is much more developmentally oriented in older and more educated married-couple families than in younger single-unmarried-mother families. These differences are then mirrored by large differences in early language development (Kalil et al. 2012; Phillips 2011).

[22] Of course one way to reduce this problem is reducing young unwanted pregnancy, which we turn to in the next section of the chapter.

What is the evidence on the ways that developmental differences open up early in life? One important set of tests comparing children at 9 and 24 months of age was conducted by Halle et al. (2009) and nicely summarizes child development issues over this period. Halle et al. examined disparities in child outcomes at 9 and 24 months in 2008 using the Early Childhood Longitudinal Birth Cohort. They found that gaps in outcomes by race, ethnicity, parental income, and education were evident at 9 months and grew larger by 24 months. These gaps were evident across cognitive, social, behavioral, and health outcomes. Infants and toddlers from low-income families scored lower on a cognitive assessment than infants and toddlers from higher-income families, were less likely to be in excellent or very good health at both 9 and 24 months, and were less likely to receive positive behavior ratings at 9 and 24 months.

Nearly half of all infants and toddlers—approximately 1.5 million children—in families with incomes below 200 % of poverty at 9 and 24 months of age had multiple risk factors. The most prevalent risk factors were low family income and low maternal education at both 9 and 24 months (see Appendix). Equally important, given the demographic changes underway in the U.S., infants and toddlers from more at-risk backgrounds (i.e., children from racial/ethnic minority groups whose home language was not English, and/or who had mothers with low maternal education) scored lower on cognitive and positive behavior ratings (Fig. 8.6). In each of these minority groups, scores were below those for non-Hispanic White children and, in each case, differences were larger at 24 months than at 9 months.

When a child is getting ready to enter preschool, his or her first educational institution, several factors are important for whole child development, including the

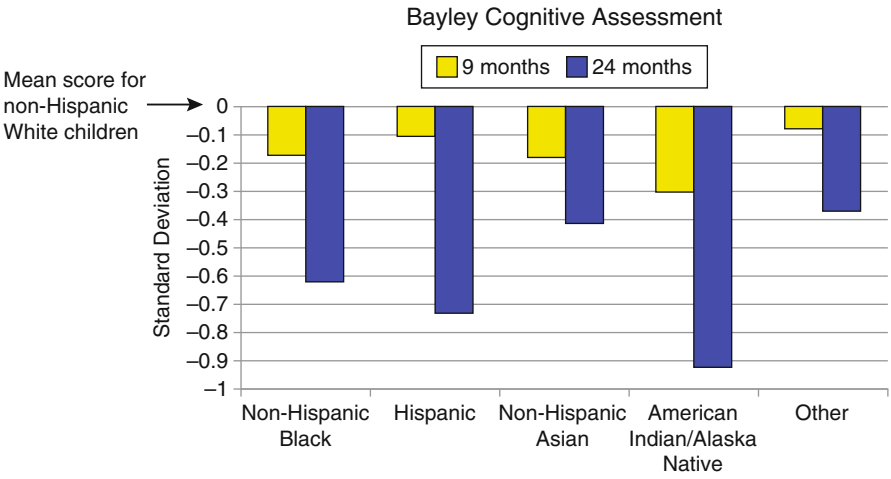

Fig. 8.6 Racial and ethnic cognitive disparities at ages 9 and 24 months (Source: Disparities in Early Learning and Development: Lessons from the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B) – Executive Summary by Halle, Tamara, and Nicole Forry. Reproduced with permission of Child Trends Inc. in the format Republish in a book via Copyright Clearance Center)

home environment, parental skills, and behaviors as reviewed above. With respect to health issues, parental mental health is liable to be a major barrier to well-child development, along with other barriers such as poor nutrition, vision problems, hearing deficits, undertreated asthma, anemia, and dental pain. These are all more common in low-income families, and are critical to readiness before the onset of formal care or schooling.

Transition 3: Preschool and Early Childhood Education (Ages 4–6)

The goal is to have children with pre-reading and foundational math skills and school-appropriate behavior by first grade. More specifically, the goals for all early childhood education programs, with parental inputs and reinforcement, are to create a "mobility mentality" consisting of a growth mindset (the belief that success is learned, not preordained), instilling confidence in children to succeed, and raising their aspirations, as well as those of their parents. They also need the grit and character development to see setbacks as hurdles to overcome, not impenetrable walls, and the persistence, if they confront a closed gate, to find ways to open it or discover other paths. Fostering these characteristics in children from disadvantaged backgrounds, along with instilling in parents the ability to take these lessons home with them and apply them, are crucial elements.

But the challenge is great. Only 38 % of American 3-year-olds are enrolled in early childhood education programs (as compared to an average of 70 % among the 34 richest OECD nations; OECD 2015). Moreover, U.S. children tend to enter early childhood education at age 4. Even then, only 66 % of 4-year-olds were enrolled in 2012 (the OECD average was 84 %), a slight decrease from 68 % in 2005, when the OECD average was 79 %.[23]

It is well documented that there are large gaps in early childhood education and school readiness by parental education and income, which were most pronounced in the U.S. compared to other Anglo nations and which only recently have begun to stabilize (Bradbury et al. 2012). These gaps are larger now than in the past, in part because parents at the top spend vastly more in time and money on developmentally oriented goods and activities than those at the bottom (Kaushal et al. 2011; Kalil et al. 2012). We know that high-quality early childhood education programs are critical for development. Quality programs include productive teacher-child interactions, encouragement from teachers, and opportunities to engage with varied materials. Teacher quality and retention are also key ingredients for producing better outcomes for disadvantaged children. But these conditions are hard to establish or maintain in low-income areas (Duncan 2014).

[23] See OECD (2014) and figures in the section entitled "What Makes a Difference Early in Life?".

President Obama's national drive to improve early childhood education for these children is central to the effort to overcome these gaps but is hampered by differential state take-up rates in expanding preschool to all children (Duncan and Magnuson 2011). Cross-national research in Denmark and France, where universal early childhood education is the norm, shows that effective high-quality preschools do reduce the slope of the relationship of achievement to family education background. But even so, the remaining differences in both cognitive and behavioral outcomes are still significant when outcomes are ranked by parental education (Bingley and Westergaard-Nielsen 2012; Dumas and Le Franc 2012). This suggests that while early childhood education can improve opportunity and mobility from the bottom, it is not by itself the "magic bullet" for achieving desirable levels of IGM.

Cumulative Gaps?

In many ways, the U.S. system of supports and institutions performs well enough to maintain but not reduce SES-related outcome gaps once school begins (Ermisch et al. 2012; Duncan and Magnuson 2013). Hence, the gap at the beginning of elementary school is key—assuming smaller gaps upon the start of grade school would in fact be maintained and not exacerbated. We do know from longitudinal studies that there are large gaps at 9 months that widen by 24 months. This is worrisome because cross-sectional studies reveal wide gaps based on pre-K assessments at ages 4–5 (see Bradbury et al. 2012).[24] Thus, we need effective, scalable, and replicable interventions before preschool, as well as through the preschool period, if we are to make progress in improving mobility for children coming from disadvantaged backgrounds.

Summary

Essentially all the factors key to healthy child development are very much affected by parental circumstances at a point in time, and almost all the trends in differences in child development (or gaps) by parental incomes, education, and SES are on the upswing at early ages. Conditions at birth, family background, parenting, neighborhoods, social institutions, and economic circumstances all make it more difficult for low-income children, especially minority children, to successfully cross each transition point on their way to elementary school.

The social policy challenges are many, and are not just situated in the health and learning domains; the greater challenge is that medical and educational professionals

[24] Whereas the data we have on young children follows the same children from ages 9–24 months, we do not have follow-up data on the same children as they exit preschool or enter elementary school.

must interact with social services and deal with fractured patterns of family life, in addition to the children themselves. Effective action requires the integration of policies across the health, education, and family assistance silos if we are to become more successful in boosting mobility from below.

Policy Levers to Open Gates, Reduce Gaps, and Moderate Cumulative Gaps Early On

America is finally beginning to awaken to the reality that the next generation *is* at risk.[25] But we need to pay more than lip service to make a difference in children's chances for upward mobility. Moreover these challenges confront federal, state, and local authorities, as well as faith-based organizations, nongovernmental organizations, and even some organizations in the for-profit sector. In this final section we focus on some emerging green shoots of hope that need to be nurtured if we are to make progress in opening more opportunity gates and closing the gaps that emerge along the developmental trajectory. We begin with the prevention of unwanted pregnancies and children who begin life with a parent who is not yet prepared. We then move onto other policies that can make a difference in the lives of young children.

Unwanted Pregnancy at Young Ages: An Agency Problem

Despite the somewhat gloomy data cited above, the U.S. is making some progress in improving children's life chances through the reduction in the numbers of early unplanned pregnancies. For example, U.S. fertility is at an all-time low, reaching a rate of only 1.86 children per woman of childbearing age in 2013. More importantly, fertility has reached this record low because of falling birthrates among teens and women in their early 20s, bringing the U.S. teen pregnancy rate closer to that in other rich countries (Hamilton et al. 2013; Curtin et al. 2014). Much of this success is due to the dissemination of long-acting reversible contraceptives, which are much more effective than conventional birth control (Secura et al. 2014; Sawhill 2014).

Money Makes a Difference in Parenting

An important point established above is that money makes a difference, and especially so for young low-income children. An ever-growing number of studies have shown that refundable tax credits improve child outcomes in health, including birth

[25] This is more than 30 years after the then-Secretary of Education, Ted Bell, sounded the alarm in 1983 with the publication of *A Nation at Risk*.

outcomes for mothers, and the learning of young children.[26] Receiving aid from the Supplemental Nutrition Assistance Program (SNAP), a program for needy families with young children, has been shown to improve childhood health and learning outcomes as well significantly reduce the incidence of "metabolic syndrome" (obesity, high blood pressure, and diabetes). For women, SNAP serves to increase economic self-sufficiency (Almond et al. 2011; Hoynes et al. 2012). More generally, supplementing incomes for low-income families with children has a large number of positive effects, as summarized by Duncan et al. (2011), Duncan (2014), and Cooper and Stewart (2013). Specifically, cash transfers from the child tax credit and earned income tax credit (EITC) and SNAP of perhaps $1500 to $2000 per child per year lead to better outcomes for children and parents, especially longer-term important positive developmental effects on very young children.

Building on these findings, one policy strategy is to push for a stronger EITC (including one for single adults), larger refundable child allowances, and a higher minimum wage (Sawhill and Karpilow 2014; Heinrich and Smeeding 2014a, b). Although such a package would help mitigate poverty, there is also a critical need for a labor market solution that leads to more, accessible, better-paying jobs targeted at the poor and nonpoor (see Chaps. 6 and 11).

Many low-income parents are stretched thin working in one or more low-paying jobs at odd hours, making childcare almost impossible to schedule (Reeves and Rodrigues 2014). The effects of inflexible work schedules and the lack of paid days off on a parent's ability to provide emotional and physical care for young children, as well as the detrimental effects of parental stress on children's cognitive development, are all too apparent in such situations. And so another foundational element in parental assistance would be the enforcement of the Fair Labor Standards Act so that work schedules consistent with good parenting at younger ages are planned and maintained.[27]

Prenatal and Early Parenting Programs

Because good parenting is so important for child outcomes, one should try to make better parents, too. But in the new policy realm of parental improvement, ideas and efforts so far outstrip evidence of success, with a few exceptions (King et al. 2013). The starting point is prenatal health, where young about-to-become-parents must learn the importance of in-utero health and the costs of some of their own habits for child outcomes (Aizer and Currie 2014). The Nurse Home Visiting Program has been shown to be highly effective when properly deployed and when follow-up to emergent home-based problems is coordinated with local social service agencies

[26] For a nice summary see Duncan et al. 2014; also see Evans and Garthwaite 2014; Hoynes et al. 2012; Dahl and Lochner 2012; Milligan and Stabile 2009.

[27] Lest we forget, the U.S. is the only rich nation without some form of national paid family leave post childbirth.

(Annie E. Casey Foundation 2014; Haskins et al. 2009; Mosle et al. 2014). Still, substantial systematic differences exist in children's home learning experiences, and the few existing parenting programs that have shown promise often are not widely accessible, either due to the demands they place on parents' time and effort or cost. The widespread use, low cost, and ease of scalability of text messaging make it an attractive approach to support parenting practices (York and Loeb 2014). One exemplar program that seems to clearly make a difference in mobility and parenting just about the time of preschool is the Home Instruction for Parents of Preschool Youngsters (HIPPY) program for lower-income families with children ages 3–5. The program seeks to effectively train parents to be their child's first teacher while at the same time reducing child hyperactivity. Rigorous evaluations in New York found that the program significantly improved child reading scores (Sawhill and Karpilow 2014).

The Role of the Pediatrician

A second major type of parental-child intervention is centered on pediatricians and their role in early childhood development. The pediatrician and the parent are the bedrock of early child health and development. It is therefore essential that the physician treat the child and the parent as a single entity. Uncovering basic health issues, from allergies and asthma to hearing loss or diabetes, each require not only early detection but also successful chronic-care interventions. The burden of the habitual behaviors needed to overcome childhood asthma, for instance, requires competent parenting and regular application of medicine, cleanliness, and a host of other tasks. But that care management cannot be effectively delivered if a parent suffers from depression or high levels of stress. Health care targeting two generations at once holds the promise to improve both child outcomes and parent responsiveness to disease management programs, especially when that care is linked to social support services delivered by programs like the Nurse Home Visiting Program (Glied and Oellerich 2014). Pediatricians are often well positioned to assess children's well-being but usually do not ask about parental risk factors to children's health, such as smoking. One example is the SEEK Project, which trains health professionals to screen for parental risk factors and then refer the family to appropriate resources to address the problems.

Preschool: The Importance of Quality

In addition to cognitive training, there is overlap in skills training for the labor market and family formation among children and parents alike. Soft skills such as conflict resolution or how to respond to setbacks should be emphasized more in preschools *and* in parenting classes (Cunha and Heckman 2007, 2008). Because we do not yet have a good substitute for Head Start, we need to improve the model (Barnett 2011). One way to expand childcare may be to make such care more affordable through new, targeted subsidies for early childhood care (Ziliak 2014). A closer look at the programs that seem to work best in Boston and Chicago is a good starting point.

Conclusion

Americans have always been more tolerant of income inequality than their European forbearers; perhaps this was because the average standard of living was increasing across the board and because the "rising tide was lifting all boats." Americans also believed that inequality was acceptable because there was lots of movement up and down the income ladder. If one worked hard and followed the rules, he or she had a good chance of rising to the top (the "Horatio Alger" ideal). But the U.S. now faces a fourfold threat: stagnant growth in standards of living for all below the top rungs of the income ladder; a growing gap between the rich and the rest; high rates of early unplanned children by parents who are not prepared to raise them, and low rates of upward mobility that threaten belief in equality of opportunity.

Nowhere is this more apparent than in the recent patterns of uneven child development at early ages. To paraphrase Robert Putnam (2015), "our kids" are not doing well and need help to succeed. Larger majorities do not believe their children's generation will be as well off as they were. If we are to restore opportunity and improve upward mobility in the United States, we need to start very young and we need to begin right now.

Appendix

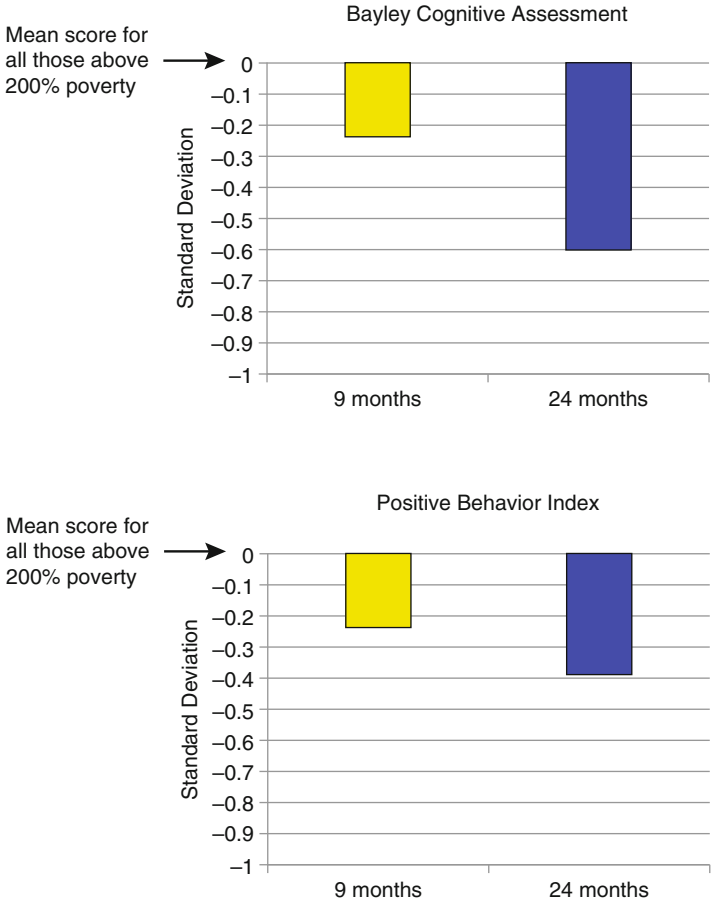

Fig. 8A.1 Disparities in cognitive and socio-behavioral outcomes by income level at 9 and 24 months (Source: Disparities in Early Learning and Development: Lessons from the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B) – Executive Summary by Halle, Tamara, and Nicole Forry. Reproduced with permission of Child Trends Inc. in the format Republish in a book via Copyright Clearance Center)

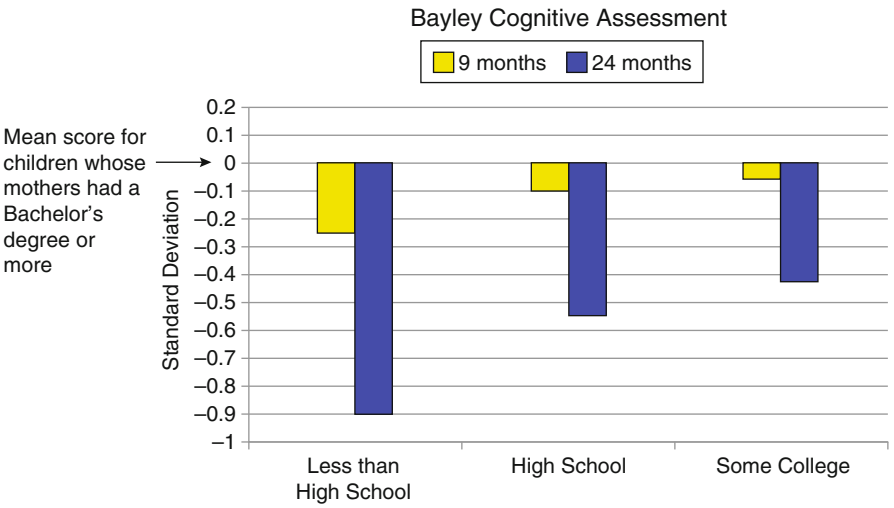

Fig. 8A.2 Disparities in cognitive and socio-behavioral outcomes by education of mother (Source: Disparities in Early Learning and Development: Lessons from the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B) – Executive Summary by Halle, Tamara, and Nicole Forry. Reproduced with permission of Child Trends Inc. in the format Republish in a book via Copyright Clearance Center)

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Chapter 9
Quality and Equality in American Education: Systemic Problems, Systemic Solutions

Jennifer A. O'Day and Marshall S. Smith

Abstract After briefly reviewing the unequal opportunities outside schools that contribute to the disparities in educational achievement, attainment, and various indicators of adult success, this chapter zeroes in on addressing inequities within K-12 education. We argue that disparities within the educational system are the product of institutional structures and cultures that both disenfranchise certain groups of students and depress quality overall. Systemic causes require systemic solutions, and we envision a three-pronged systemic remedy: a continuous improvement approach for addressing the quality of educational opportunities for underserved students as well as of the system as a whole; targeted high-leverage interventions consistent with the overall approach but focused on key transition points and needs; and stronger connections between schools and other institutions and systems affecting the development and well-being of children and youth. We then outline a change strategy that incorporates both pressure and support for improvement from three distinct but interacting sources: government and administrative policy (federal, state, and local); professional accountability and networking; and collective engagement of parental, community, and advocacy organizations. We end the chapter with a consideration of recent developments in California and the degree to which they lay the groundwork for moving an equity agenda in the state.

Keywords Opportunity • Achievement gap • Accountability • Human capital • Standards-based reform • Continuous improvement approach • Interventions • High-poverty schools • Preschool • Parental education • Segregation • Title I • No Child Left Behind • Common Core

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An Unequal Present

Education is the great equalizer—or so goes the promise. Yet the chapters in this book and decades of data belie that promise. It is not that educational achievement and attainment are unimportant to mobility and future success—the data confirm that they are. It is that—despite reform attempt after reform attempt—educational achievement and attainment continue to reflect student background: parent education, access to preschool, childhood nutrition and health, individual and neighborhood poverty and segregation. This chapter is about that persistent pattern and what it might take to substantially change it.

Let's Start with the Children

Born with virtually limitless potential and genetically predisposed to language, learning, and social enterprise, our children represent at once the promise of our society's future and the vestiges of its past and present failures. Much of this book is about those failures—or more specifically about a certain kind of societal breakdown: the systematic denial of opportunity across generations of Americans based on their class, race, geographic location, gender, or national origin. For the children of these Americans, the chance to grow into their full potential is sharply constrained and sometimes squelched altogether by social structures, endemic beliefs, and policies beyond their control or that of their families.

Who are these children? Primarily they are our young people growing up in poverty. Over 16 million children in the U.S. are officially classified as living in poverty; this is 20 % of all children and 25 % of those under the age of 5. Moreover, 40 % of poor children live in "extreme poverty"—that is, in families with annual incomes less than half of the poverty level for a family of four ($11,746). These figures are significantly confounded by race, as children of color are more than twice as likely to be poorer than White children, and a full one-third of all children of color live and grow up in poor households (Children's Defense Fund 2014).[1]

The external conditions in which these young people live and learn have important implications for their preparedness for and participation in school.[2] Consider the most basic needs: food and shelter. In this the most prosperous nation in the

[1] Recent data from the National Center for Educational Statistics (NCES) find that 51 % of U.S. schoolchildren are eligible for the free and reduced price meal program, which some observers have as a majority of U.S. students being in poverty (http://www.washingtonpost.com/local/education/majority-of-us-public-school-students-are-in-poverty/2015/01/15/df7171d0-9ce9-11e4-a7ee-526210d665b4_story.html). A more accurate label of "low income" for the figure in this article is used by the original report from the Southern Education Foundation http://www.southerneducation.org/Our-Strategies/Research-and-Publications/New-Majority-Diverse-Majority-Report-Series/A-New-Majority-2015-Update-Low-Income-Students-Now).

[2] See Duncan and Murnane's (2014) excellent treatment of these topics.

world, one in nine children lacks adequate access to food and basic nutrition, which negatively impacts development and school performance (Jyoti et al. 2005). Black and Latino children are twice as likely to be food insecure as their White counterparts. Inadequate nutrition is both a result of insufficient family income and the deterioration of the neighborhoods in which these children live. There are whole census tracts in some U.S. urban centers that are veritable "food deserts," areas that lack grocery stores where residents can buy fresh meat and produce, forcing them to rely instead on prepackaged nutrition-depleted processed foods.[3] Poor nutrition plus inadequate health care combine to contribute to higher rates of serious medical conditions like asthma, diabetes, and obesity as well as developmental, behavioral, or social delays. And children in poor families are twice as likely not to receive preventive dental and medical care than their more advantaged counterparts and significantly less likely to have health insurance (Children's Defense Fund 2014).

With respect to opportunities for learning and social development, children from poor families are similarly disenfranchised, as low-income parents have few resources to devote to enrichment activities. Indeed, Duncan and Murnane (2014) report that in 2005–2006, the gap between what lower-income and higher-income families spent on enrichment activities was $8000 annually, a figure that had tripled since 1972 as inflation-adjusted income disparities grew. Moreover, many children in low-income families live in situations where their parent(s) have little support in parenting and must rely on the TV to babysit.[4] When of an age for preschool, the majority of low-income students do not attend because there are none available or because their families cannot bear the cost.[5] A large body of evidence indicates that too many of these children enter school with a working vocabulary and number skills of far less than more advantaged children and without socialization experiences that prepare them for making the most of kindergarten (Yoshikawa et al. 2013). Moreover, children who do not attend a preschool such as Head Start are less likely to graduate from high school and go to college and more likely to get pregnant in teenage years or be imprisoned (Deming 2009).

As they get older, many of these young people have little access to community affordances that middle-income children take for granted—parks, playing fields, sports teams, safe havens. Segregation is a major culprit here. Though residential segregation by race has declined slightly in recent decades, segregation by income

[3] The language in the 2008 Farm Bill defined a food desert as an "area in the United States with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower income neighborhoods and communities" (Title VI, Sec. 7527). See U.S. Department of Agriculture (2009). The entire area of West Oakland in California's prosperous San Francisco Bay Area is a case in point. See McClintock (2008).

[4] This problem is exacerbated for children of single parents, who are four times more likely to be poor than children of married couple families (Children's Defense Fund 2014).

[5] The Children's Defense Fund (2014) reports that the average cost of center-based care for infants is greater than the annual in-state tuition for public colleges in 35 states and Washington, D.C. For 4-year-olds the average cost is more than college tuition in 25 states and D.C. Only 16 % of 3- to 4-year-olds attend state-run preschools, and fewer than 40 % nationally were enrolled in any kind of preschool during the period from 2009 to 2011.

has increased: in 2010, 28 % of lower-income households were located in majority low-income neighborhoods, up from 23 % in 1982 (Reardon and Bischoff 2011; Fry and Taylor 2012). And high poverty generally means low services; many of these neighborhoods lack everything from banks to grocery schools to good schools. What they don't lack are sources of stress and trauma. Too many poor children live in neighborhoods that are not safe of drugs, crime, and sometimes physical as well as emotional harm. Often they live in such conditions throughout school and beyond—it becomes one of the few constant features of their young life. And these conditions make academic learning, both inside and outside school, difficult.

While some children in these circumstances—whether through family and community supports, their own personal resilience, or intervention of a successful program or school—are able to overcome the predicted pattern of intergenerational poverty, many others are not. The widening income gaps and erosion of the middle class exacerbate and extend the problem, and the lack of a coherent support infrastructure means that few children and their families have access to avenues out of poverty.[6]

[6] Segregation and public and private divestment in high-poverty neighborhoods, particularly those of color, is not the product of residential choice but rather of decades of discriminatory practices and policies (Massey and Denton 1993; Rothstein 2013). Moreover, current approaches to providing safety nets and advancement for the residents of these neighborhoods are woefully lacking. In the U.S., unlike many other nations, the responsibility for health, social services, and income support is spread between the federal government, states, and communities. Though the federal government finances a large portion of these services the funds are distributed according to different rules of multiple programs that have sprung up over the years. Many state governments and communities also provide lists of services for the poor, sometimes in the same sectors as the federal government. While the various levels of government may attempt to act rationally, the forces of politics and ideologies work to create a mix of services that differ in quality and scope from state to state and community to community and often fail miserably to meet the needs of the community. In addition, in many communities and settings, churches and other nongovernmental organizations provide services, some funded by governments and other by philanthropy. All of this creates a bewildering and incoherent patchwork of organizations that, in many settings where there are concentrations of the poor, are often opaque and inadequate to meet daily needs, much less provide the sense of security necessary for the recipients of the services to figure out how to improve their own lives.

The product of distributed federalism in the U.S. that is exemplified by the often-incoherent provision and delivery of support for children from low-income families is unlike the governments of the countries such as Finland, Singapore, and South Korea. The Finnish central government, for example, supports well-organized and coherent systems for delivering health, family support, preschool, and other benefits for all of its population. The importance of predictable and high quality social services for children growing up in poor families is detailed in other chapters of this report. The effects of the incoherence on the probability for success in schools are large and pervasive.

Where Do the Schools Fit In?

Residential segregation, poverty, low levels of parental education, and limited access to social supports and preschool learning all influence students' educational achievement and attainment, which in turn are strong predictors of adult earnings and civic participation. In this equation, education is a key intervening variable.

We led this chapter with a litany of the environment's challenges for children from low-income families and the importance of social services and enrichment opportunities to support their readiness for school at age 5 and their learning in school as children, youth, adolescents, and young adults. The average number of hours per year that a student is in public school is roughly 1000. The average number of waking hours for the same student during a year is roughly 5500. During the 4500 h a middle-income student is awake and out of school, the student has a myriad of opportunities for learning experiences that children in low-income families are not offered.

Yet inequalities outside schools do not let schools off the hook. Schools are our society's central institution serving students from all backgrounds and—in theory—supplying them with the knowledge and skills they need to have a fair shot at success in adulthood. That schools *can* make a difference in children's life trajectories is evident from the isolated but powerful examples of highly effective high-poverty schools that produce success for students who would otherwise be unlikely to progress at pace, graduate, or attend college (see, for example, Cunningham 2006; Kannapel and Clements 2005; Reeves 2003; and Carter 1999). There are even examples of whole districts that have significantly and substantially narrowed gaps in achievement and attainment among groups of students over time.[7] We discuss several of these in greater detail later on.

Unfortunately, such places are the exception rather than the rule. Indeed, as the Equity and Excellence Commission (2013) notes, "The current American system exacerbates the problem [of unequal opportunities outside school] by giving these children less of everything that makes a difference in education." (U.S. Department of Education 2013, 14). What is this "everything" of which the Equity Commission writes?

Unequal Resources

One way to approach this question is to consider the most basic learning situation for students in school: the instructional unit. Cohen et al. (2003) define the instructional unit as teachers and students interacting in the presence of content. In this conceptualization, all three of these elements—students, teachers, and content—could be considered resources that provide opportunities for student learning.

[7] These examples include such districts as Long Beach and Garden Grove in California; Union City, NJ; and Montgomery County, MD.

Let's start with students, as the makeup of a school's student body influences access both to high-quality teachers and to challenging content. Poor children are increasingly concentrated in schools and classrooms with other poor children, reflecting both residential segregation and student placement policies within schools. In 2011–2012, 19 % of public school students[8] attended high-poverty schools (greater than 75 % poverty) and 44 % attended schools with at least 50 % poverty; these figures were up from 12 to 28 %, respectively, in 1999–2000.[9] With respect to race, Black and Latino students attend schools with nearly twice as many students who are poor as White students do. Pervasive in cities, school segregation is also pronounced even in predominantly White suburbs, where 40 % of Black and Latino students attend intensely segregated schools that are at least 90 % Black and Latino (Orfield 2009, 2013).

Studies carried out over several decades find a consistent independent effect of school-level poverty (in addition to the effect of individual poverty) and racial composition on student achievement (see, for example, Perry and McConney 2010; Rumberger and Palardy 2005; and Caldas and Bankston 1997). Concentration of poor students and students of color in certain schools affects the learning environment in multiple ways. Students in these schools are more likely to be in classrooms with schoolmates who have behavior problems and low skills. Student mobility rates in such schools are also higher, which increases disruption in learning for both mobile and nonmobile students (Raudenbush et al. 2011). But most importantly, the concentration of poor students is correlated with the levels of other resources— teachers and other adults, curriculum and instructional materials, facilities, and so on.

In this array of school-based resources, teachers are the most critically important for supporting learning, and study after study indicates that children of color and children in poverty are less likely to be taught by qualified, experienced, and effective teachers (Clotfelter et al. 2010; Isenberg et al. 2013). Summarizing research across varying measures of quality, Adamson and Darling-Hammond (2011) report that students of color in low-income schools are three to 10 times more likely to have unqualified teachers than students in predominantly White schools. Neighborhood environment and low salaries are among the obstacles to recruiting qualified staff in these schools, but poor working conditions—including inadequate support from school administration, disruptions, and limited faculty input in decision making—contribute to a 20 % average annual departure rate among teachers in high-poverty schools (Simon and Johnson 2013; Ingersoll 2004). The constant faculty churn makes it difficult for teachers in these schools to develop a strong sense of professional community, adds to the instability that children in these

[8] Educational statistics use eligibility for free and reduced price lunch as a proxy for poverty. Students are eligible for free lunch if their family income is below 130 % of the poverty level; eligibility for reduced-price lunch extends from 130 to 185 % of the poverty level.

[9] For the most NCES recent data, see Snyder (2014, Tables 102.50, 216.30, and 216.60), retrieved from http://nces.ed.gov/programs/coe/indicator_clb.asp on April 12, 2015. Also see Owens et al. (2014).

schools face in other parts of their lives, and exacerbates staff recruitment challenges. Moreover, departing teachers are disproportionately replaced with novices, who on average are less effective than their more experienced peers (see Henry et al. 2012; Kane et al. 2006; Papay and Kraft Forthcoming). Once these teachers obtain a little experience and skill, they also often depart (to be replaced with a new round of novices), creating a pattern of reshuffling of teachers from poor to not-poor schools, high-minority to low-minority schools, and urban to suburban schools (Ingersoll et al. 2014).

Next to teachers in importance is the content to which students are exposed, but again poor students and students of color get less than their more advantaged peers (Schmidt and McKnight 2012). For example, high schools serving Black and Latino students are less likely to offer advanced mathematics, Advanced Placement (AP), and gifted and talented courses than schools serving mostly White students. And in schools that do offer such courses and programs, students of color are less likely to be enrolled in them (Theokas and Saaris 2013).

Underlying many of these differences are disparities in fiscal resources available to schools. Variations in both state and local wealth and commitment to education mean that children in districts in one state may have substantially greater resources than those in another state, and children in one community may have the benefits of substantially different resources than those in another district in the same state. At the state level, the highest spending state (New York) spends three times more per pupil than does the lowest spending state (Utah) (Dixon 2014). Not surprisingly, there is considerable overlap between lower spending states and those with the highest levels of poverty among school-age children. Within states, the same pattern is evident, though there is considerable variation across states in the spending disparities among local districts within their borders. For example, in 2009 states in the Northeast had the highest funding inequities across districts (averaging about $2000 per student, or 14 % of the total) while states in the West were among the most equitable with an average disparity of approximately $1100 (New America Foundation 2012).

The bottom line is that while poor students need more resources to even hope to reach the level of opportunity of more advantaged students, they actually receive less.

Organizational Dysfunction and Unequal Practices

Differences in resource amounts are only part of the story. Often neglected by their districts, high-poverty schools are more likely than those of more advantaged students to be dysfunctional organizations with low levels of trust among the adults, ineffective leadership, and incoherent educational programs. Buildings are often poorly maintained and environments are unfriendly (and sometimes unsafe) for staff and students alike. Morale and commitment are often low, making it difficult to motivate and sustain improvements, especially in the face of high faculty turnover.

Even more damaging are the attitudes toward the students. Low expectations in these schools (and of these schools by their district leadership) have been well documented (see, for example, Boser et al. 2014). Placement policies systematically track poor students and students of color away from higher-level courses, even when they have demonstrated the requisite skills. Discriminatory application of discipline and special education policies results in disproportionate numbers of Black and Latino students (particularly males) being removed from their classes through suspension, expulsion, and placement into restricted environments for "emotionally disturbed" children.[10] Often these practices are implemented with the best of intentions and with a belief that the policies are fair to all students. The resulting pattern is nonetheless discriminatory, whatever the intentions.

The disparities in opportunities outside school are thus compounded by disparities within our educational systems. It is therefore hardly surprising that the National Assessment of Educational Progress (NAEP) records achievement gaps in mathematics of two or more years between Black or Latino eighth-grade students and Whites as well as between students from low and high-income families. The gaps for reading are slightly smaller. Nor given these patterns is it surprising to find that White students graduate at a rate 13 and 17 points higher than Black and Latino students, respectively (Stetser and Stillwell 2014).

Though these patterns are pervasive and persistent, they are not immutable. Over the past six decades, we have learned a great deal about the learning process, the contributors to unequal outcomes for students, and what it takes to change complex systems. We have also achieved a beginning level of success.

Signs of Progress

One sign of progress is the positive trend for American students on several aggregate measures of achievement compared both to their counterparts in other developed nations and to the historical data on outcomes here in the U.S.[11] For example, in 2011, the average scale score in mathematics for all U.S. eighth graders on the Third International Mathematics and Science Study (TIMSS) was 509, nine points above the international average of 500 and 16 points above the U.S. score of 493 in 1995. This represented the sixth largest gain among the 31 countries that took the assessment in both years. (We focus on eighth grade throughout these analyses because they provide a better estimate of overall schooling than those in the earlier grades and represent the whole population of a cohort better than 12th-grade scores,

[10] These practices have been well documented in the October 1, 2014, "Dear Colleague" letter from Catherine E. Lhamon, Assistant Secretary for Civil Rights, U.S. Department of Education (Lhamon 2014).

[11] The numbers in this section are based on analyses of NCES data using the NCES Data Explorer (nces.ed.gov/nationsreportcard/NAEPdata/) and International Data Explorer (nces.ed.gov/surveys/international/ide/).

which do not include dropouts.) In science, U.S. eighth-graders scored ninth at 525, a 12-point gain from 1995 even though science had not been a specific focal point of the U.S. education reform efforts. It is important to note that all of the nations that scored better than the U.S. had substantially lower rates of poverty.[12] Finland, for instance—with which the U.S. is often (negatively) compared—has a poverty rate of only 5 %. By way of comparison, Massachusetts, whose TIMSS scores are the highest of the U.S. state participants in the assessment, has a poverty rate somewhere around 13–15 % and scores that are substantially greater than those of Finland. Indeed, Massachusetts' science results would place it second in the world if it were a country.[13]

Achievement and attainment trends on U.S. measures reflect an even clearer pattern of growth. Eighth-grade mathematics scores on the Main NAEP increased 15 points between 1996 and 2013, a gain of roughly 1.3 grade levels. In NAEP reading, average eighth-grade scores went from 257 in 1994 to 266 in 2013, an increase of nine points, or a little less than one grade level.

With respect to achievement gaps between groups of students, the picture is more mixed. The good news is that there was some narrowing of the gaps between Whites and Blacks and between Whites and Hispanics in mathematics, with a smaller narrowing in reading. In general the growth was consistent over the past two decades for all of the groups, with Whites gaining less than Blacks and Hispanics.

By contrast, there was virtually no overall reduction in the gaps between poor (defined as eligible for free and reduced price lunch) and nonpoor students. In eighth-grade mathematics, for example, both groups increased their performance by 18 points between 1996 and 2013, and the gap remained 27 points or about 2.5 grade levels. Duncan and Murnane (2014) and Reardon (2011) find the same pattern of a reduction in the gaps between White students and Black and Hispanic students while income gaps stay the same or increase.

A second sign of progress is the recent increase in high school graduation rates. The U.S. Department of Education recently released a report showing an overall average freshman graduation rate of 81 % for the nation in 2012–2013. Murnane (2013) in a comprehensive paper points out that the rate was stagnant from 1970 to 2000 and since then shows a substantial overall increase, with especially large

[12] Most international organizations measure the poverty rate somewhat differently. They use the metric of 50 % of the disposable median income in the country as the measure of poverty. Using this metric, the Organisation for Economic Co-operation and Development (OECD) number of roughly 22 % of U.S. children in families under the poverty level is very similar to the U.S. number. It places the U.S. 29th of 34 OECD countries—the four countries with higher rates than the U.S. are Chile, Mexico, Bulgaria, and Israel. (See OECD Family Database, CO2.2: Child poverty, http://www.oecd.org/els/soc/CO2_2_ChildPoverty_Jan2014.pdf. See also Max Fisher, "Map: How 35 Countries Compare on Child Poverty (The U.S. Is Ranked 34th)", *Washington Post,* http://www.washingtonpost.com/blogs/worldviews/wp/2013/04/15/map-how-35-countries-compare-on-child-poverty-the-u-s-is-ranked-34th/).

[13] In eighth-grade TIMSS math in 2011, Massachusetts scored 560, Finland 514, the U.S. average was 510, and the international average was 500. In eighth-grade science, Massachusetts scored 567, behind only Singapore; Finland scored 552, the U.S. 525, and Ontario 521.

increases for Hispanic and African-American students. Using a different metric (adjusted status completion rates for 20–24 years), which he convincingly argues has greater validity than "average freshman graduation rate", Murnane finds an overall 6 % increase in completion rates from 2000 to 2010 to 83.7 %. During this time period, Whites gained 4.5 points to 86.3 %, while Blacks gained 10.2 points and Hispanic students jumped 13.9 points, both to roughly 78 %.[14]

We suggest two main takeaways from these data. First, the predominant force driving the gaps—and overall achievement levels—is family income and the concomitant conditions associated with it (see previous section).[15] While race differentials controlled for income have not disappeared, they have declined. This suggests that the independent effect of race/ethnicity is decreasing and that a good portion of the overall racial gap might be explained by the disproportionate percentages of African-American and Latino youth living in poverty. This is not to say that race should be ignored. Quite the contrary. The related effects of discrimination and language and the very high levels of poverty and especially intergeneration poverty among Blacks and Hispanics make it imperative that these issues be treated together.

A second takeaway is that there is both some momentum to build on and much more to be done. The achievement gaps both by race/ethnicity and by income remain unconscionably large, with significant impact on the quality of life and work for far too many of our nation's children. In addition, the positive momentum in achievement appears to apply primarily to tests of more procedural knowledge and of the curriculum of the 1990s and early 2000s NAEP and TIMSS. We do not see the same pattern of improvement, for example, on the Programme for International Student Assessment (PISA), which assesses the ability of students to *apply* their knowledge and skills in mathematics, science or reading to analyze novel situations and solve complex problems—the very type of performance needed for success in the twenty-first century. On PISA, the U.S. performance has remained fairly stable since the assessment was initiated in 2003, hovering around the international average in science and reading and substantially below the international average in math. This suggests the need to extend and deepen our improvement efforts in education.

The Common Core State Standards for Mathematics and English Language Learning and Next Generation Science Standards (or similar college and career readiness standards) may be a good step in this direction as they are reflective of the types of knowledge and skills that PISA assesses and that students will need in adulthood. To successfully move in this direction, however, requires that we learn from previous reform efforts, a subject to which we now turn.

[14] See U.S. Department of Education, "U.S. High School Graduation Rate Hits New Record High", http://www.ed.gov/news/press-releases/us-high-school-graduation-rate-hits-new-record-high; see also Murnane (2013).

[15] It is likely that accumulated family wealth is also a key factor—perhaps even more so than income, but we have no way of validly linking wealth to the NAEP trends.

Observations from 60 Years of Equity Reforms: There Are No Silver Bullets

Americans have a penchant for quick fixes and easy solutions. We like to do things quickly and if we don't see results right away, we move on to the next new and improved approach. In no arena is this American predilection toward the fast and easy more evident than in education. We have been through numerous reform efforts in the past 60 years, many of them focused specifically on reducing the gaps in opportunities enjoyed by more and less advantaged groups in our society and our schools. We have targeted money at the problem through supplemental funding streams, like the federal Elementary and Secondary Education Act (ESEA) and state categorical programs, and through a myriad of state fiscal equity suits and policies. We have tracked and detracked students, tried homogenous grouping by ability and heterogeneous cooperative learning in the classroom. We have tried pullout and push-in instructional approaches to give extra support to students who need it. We have focused exclusively on academics only to turn around and chide ourselves for ignoring the whole child. We have thought teacher testing and formal qualifications on the front end were the answer to low educator quality, moving more recently to test-driven teacher evaluation as the new required solution. And the list goes on.

While often these solutions have a faddish quality to them—that is, they are popular for a time and then die out when the next new thing or new leader comes along—they are not necessarily without merit or void of at least a promising research base. Indeed, in the past 15 years there has been considerable interest in and policy support for adoption and use of what has come to be referred to as "evidence-based practices." The idea is straightforward: figure out "what works"—usually these are very targeted interventions with a reasonable effect size found in one or more rigorous research studies; adopt and implement the practice at scale; and finally, realize the expected improvements in overall outcomes and gap closings. A corollary to this theme is often the idea that if we adopt multiple evidence-based practices, benefits will cumulate to an overall larger effect.[16]

In the main, we believe that the focus on evidence and effectiveness has been a positive development and has contributed to some portion of the gap closings cited above. But almost invariably, when individual interventions are implemented at scale in schools and districts, the results are far less than anticipated and sometimes disappear altogether. While there are many contributing factors, we see two main interrelated explanations for the diminished effects. First, implementation challenges across multiple and varying contexts lead to uneven and sometimes unforeseen results. Second, individual interventions, usually focused on a specific targeted disparity, often leave untouched the systemic contributors that underlie and

[16] For example, see Grannis and Sawhill (2013) for a thoughtful discussion of implications of the Social Genome Project and an estimate of the cumulative benefits of a set of research-based strategies.

perpetuate that disparity. We review each of these problems below and draw out several lessons for moving forward.

Lesson One: Implementation Dominates Impact

It has been said that implementation is 90 % of impact. The very same intervention applied in one school, locale, or state may yield quite different results than when employed in another. Problems of inadequate resources, weak commitment, or poor fit are often cited to explain disappointing outcomes. This situation is not unique to education; in fact, the field of implementation science, which grew out of concerns about the limited uptake of evidence-based practices in medicine, seeks to apply research on implementation patterns and strategies to improve their application and use across a wide range of social domains. "Implementation varied" is probably the most commonly reported finding across decades of policy and program evaluations. Yet implementation considerations generally get short shrift when policy makers and administrators are considering options and calculating expected impact. Decades of implementation research have yielded a panoply of implementation lessons that could be applied to considerations for equity-oriented policies. Here we focus on three that are integral to our vision of how a more equitable education system would need to operate.

Context Matters

Research on organizational learning and change holds that all change is history dependent. Schools, districts, and even states differ in their educational histories, including the past performance trajectories, their experience with particular strategies and interventions previously tried, and the expectations that derive from these experiences. They also differ in the makeup of both the adult and the student populations in their systems and the histories that each of these groups has had with schooling, inequality, and change. Varying cultures, conditions, and structures across organizational units and systems can influence the ways in which local actors interpret and act on any given reform or intervention (O'Day 2002, 2008; Spillane et al. 2006). Weatherly and Lipsky's (1977) seminal piece on "street-level bureaucrats," which examined variation across three districts in their implementation of special education in Massachusetts, spawned a host of increasingly sophisticated analyses of the causes and manifestations of contextual variation in implementation.

Attempts to constrain such variation through emphases on fidelity, scripted instructional programs, and one-size-fits-all policies do not solve the problem, as

they often inhibit professional judgment and responsiveness to individual student and local system needs. Indeed, such approaches may be counterproductive.[17]

Capacity Is a Key Determinant of Implementation Quality and Results

At the heart of many of the differences in implementation across contexts is their variation in local capacity. Scholars have taken differing approaches to delineating the elements of capacity that matter for improving student outcomes. (Beaver and Weinbaum 2012). All would agree that *human capital*—the knowledge and skills of individual actors and of the collective body of actors—in a system or site has broad implications for how a given intervention, program, or policy is understood, whether the actors are able to carry out the required or suggested actions, the degree to which the system can adapt to changing conditions and threats to implementation, and so on. Many research-based efforts, from bilingual education to new math or literacy curricula to teacher evaluation rubrics, fail because those who would implement them lack the requisite knowledge and skills. Most observers would also include the amount and appropriateness of available *material resources*—such as money, instructional materials, and facilities—in notions of organizational or system capacity. Sometimes these resources are the target of particular reform efforts; often they can determine the success or failure of any given strategy.[18]

While people and resources are critical, they are not enough, however. Another aspect of organizational capacity is what several researchers have termed *program coherence*. Coherence in education implies shared goals and frameworks and the presence of working conditions, structures, and routines that support those goals and allow the actors in the system to focus on their attainment (Newmann et al. 2001; Beaver and Weinbaum 2012).[19] Like human and material capital, program

[17] For example, during the era of Reading First grants, in systems focused on preventing such variation, observers would often encounter references to the "literacy police," administrators whose job it was to ensure that all teachers were following the program on a daily basis as scripted. The intent was to ensure that all students has access to research-based literacy instruction, but teachers argued that the program was often ill-suited to their particular population, including English language learners, special education students, or others who needed specialized attention. Similarly, professional development programs that are designed for *all* teachers often fail to meet the differentiated needs of most and may not align with the particular issues at a given school or grade level.

[18] One clear example is the implementation of class size reduction in California. While districts received state funds to reduce class sizes in K-3 to 20 or fewer students, many districts, particularly urban systems with already overcrowded and understaffed schools, lacked the classroom space and a pool of qualified teachers to make these reductions effectively. This led to a reliance on portable classrooms and the hiring of large numbers of under-credentialed and novice teachers, who were disproportionately assigned to work in schools serving poor students and students of color. As a result, this massive reform effort, intended to benefit low-income students and schools, actually exacerbated disparities in access to qualified and experienced teachers and adequate facilities (Bohrnstedt and Stecher 2002).

[19] Conversely, program coherence implies an absence of factors that detract from or inhibit implementation.

coherence is not equitably distributed across schools and districts. We have already noted the organizational dysfunction that characterizes many high-poverty schools, caused by years of neglect, environmental stresses, and high rates of staff turnover. A similar observation could be made of many low-capacity districts. One manifestation of this incoherence is either a flitting from one reform effort to another in search of the panacea or the accumulation of multiple interventions and programs—some well-intended and researched but all vying for attention and resources. Lack of coherence in high-poverty schools and districts makes it difficult for teachers and administrators to select and adapt strategies that build on one another and enhance their ability to systematically address the learning needs of their students.

Implementation Is a Social Process

The past few decades have brought increasing attention to the importance of social capital and trust for diffusing effective practices and for enhancing learning and improvement in the conduct of one's daily work. Social capital resides in the relationships between and among people, groups, and organizations (Coleman 1988). For effective implementation to occur, these relationships must be activated, not just once but through multiple interactions on an ongoing basis.[20] Unfortunately the isolation of schools and teachers that is common in American education systems generally is exacerbated in high-poverty contexts where turnover and lack of trust impede the development of strong relationships that can mobilize implementation of evidence-based practices. Thus, even those interventions that are specifically designed to benefit such systems and the children and adults in them often never find their way where they are most needed. Attempts to ensure spread and implementation through administrative mandates do little to solve this problem and often lead to superficial compliance without deep understanding or committed action. When the pressure subsides, so does reform.

Lesson Two: Piecemeal Reforms Leave Systemic Contributors Untouched

Underlying many of these implementation challenges is the fact the isolated and piecemeal reforms often fail to address underlying systemic contributors to the very situation or inequity that they are attempting to address. Take the example of incentive programs that are designed to attract more qualified and effective teachers to work in high-poverty schools but leave untouched the dismal working conditions that cause turnover in the first place (Ingersoll 2004; Simon and Johnson 2013). Or

[20] See Rogers et al. (2009) for a discussion of the importance of social relationships in implementation, and Gawande 2013 for how this plays out in healthcare. For a discussion of the role of social learning in the conduct of one's daily, see Bransford et al. (2015) and Bryk et al. (2010).

consider school accountability policies that penalize schools for low performance but let districts off the hook, leaving unaddressed the policies and practices that concentrate low-performing students and inexperienced teachers in those schools and pay insufficient attention to building the capacity for long-term improvement.

In each of the implementation challenges discussed above, the success of individual reforms is constrained or thwarted by conditions endemic to the system itself. What's more, incoherence and instability in the policy environment make it difficult to identify and change these conditions. Superintendents, school boards, and legislators come and go, but disparities in resources and practices go on, bolstered by institutionalized structures and beliefs. Edicts from the federal government and states are often contradictory and ill suited to the specific and varied conditions across contexts. Fragmented governance, politics, top-down compliance, inadequate data systems, bureaucratic human resource policies, and isolation of schools from other systems and organizations affecting children's welfare combine to reinforce existing disparities in resources and processes. On the ground, schools in high-poverty neighborhoods lack the information, trust, and capacity they need to examine their practices and results over time and are pulled in multiple and conflicting directions by the mixed messages they receive. High-stakes testing and accountability measures can compound these issues and have the effect of drawing attention to avoiding consequences for adults rather than ensuring progress for students.[21]

Seeing the limitations in the current system as insurmountable barriers, some politicians and reformers have turned to charter schools and school choice as answers, a way to remove regular public schools—particularly those serving poor students and students of color—from a system that has repeatedly failed these children. Though promising in many ways, however, charters are no more a panacea than any other intervention. They free schools from many constraints and allow more innovation and experimentation, but much of the research suggests that most charter schools are quite similar to public schools in both their organization and results (Raymond et al. 2013). Charters could serve as a learning ground for the larger system and the field as a whole, and some districts have made use of their charters in this way. In most cases, however, mechanisms for feeding information back into the larger system, in ways that it can be effectively used, are either limited or absent altogether. As a result, charters as a whole do little to address the situation for the vast majority of underserved students in American schools.[22]

[21] For discussions of the effects of current high stakes testing policies on schools, see Schoen and Fusarelli (2008); Berliner (2011); and Cawelti (2006).

[22] Schools associated with a few of the charter management organizations (CMOs)—deliberately formed groups of charter schools that are similar in vision and strategy—do show signs of significant success. They include Aspire, KIPP, Achievement First, and High Tech High among others. One way of thinking about these CMOs is that they are public systems freed from many of the regulatory constraints of regular public districts and schools. Another way to think about them is that they could be compared to effective districts as they serve many of the same functions and demonstrate similar characteristics.

Vision of a More Equitable Education System

What are the implications of our discussion of educational inequalities and lessons from equity-based reforms? What might a more equitable education system look like? And how might we more effectively move in that direction, not only for a few schools and districts but across whole systems and states? In the next section, we draw on our previous discussion and on 20 years of systemic standards-based reform to sketch out a vision of how a more equitable education might operate in the U.S. We argue that to address the deep and pervasive inequities we've described requires a system-wide focus on quality improvement within a standards-based framework, combined with targeted interventions to address particular and pervasive disparities within schools, and coordinated efforts between schools and other agencies and organizations serving children and their families. In the final two sections of the chapter we turn to the problem of motivating and supporting change toward such a vision and provide an example of a state working to move in this direction.

Three assumptions frame the focus and limit scope of the vision we present. First, we recognize that the ecosystem in low-resourced and often dysfunctional environments in cities and rural areas affects both the social system outside of the schools and the schools themselves. We thus assume that changes in both the out-of-school opportunities and the within-school opportunities are necessary if we wish to dramatically reduce student achievement and attainment gaps. However, we also assume—with considerable evidence to back this up—that schools can make a major difference. Though we believe it is necessary to figure out promising ways to ensure that all children have a real opportunity to be ready for school, that they and their families live in supportive environments, and that they have opportunities for employment beyond their schooling, we leave this task to other authors in other chapters of this volume. We focus here on the schools.

Second, we assume the American educational system will not change in its general form in the next decade or two. We do not propose to "blow up the system," however appealing that might be to some. While we expect that technology will influence to some considerable extent how students learn and teachers teach—especially as older teachers retire and new teachers come in having been raised in the Internet era—we anticipate that for the foreseeable future we will continue to have schools where most students come together to learn, that this learning will take place over 13 grade levels (K-12), and in classes of 15–30 students. We also expect that districts and district school boards will continue to exist and set the rules at the local level and bargain with the local unions. We expect charter schools to remain as an alternative for some small portion of students.

Finally, we recognize that the conditions we outlined in the beginning of this chapter do not simply diminish opportunities for traditionally underserved students. They also depress the quality of schooling for all—or at least the vast majority of—students in U.S. schools. International comparisons demonstrate the limitations of American educational opportunity. These data and our earlier discussion suggest

quality and equality are interactive concepts. Any approach to improving equality of opportunity must pay attention first and foremost to the quality of the schools and school systems and their ability to improve conditions for students over time. At the same time, any attempt to improve the quality and outcomes of our educational systems overall will be successful only to the extent that it also reduces disparities and fosters success for those who have traditionally been least successful in school.

The Foundation: A Quality School System

Our analysis of the recent era of educational reform in the U.S. as well as of more successful systems both here and abroad leads us to posit two core elements of a high quality system: a standards-based and supportive policy framework and a continuous improvement approach at all levels of the system.

Coherent Standards-Based Policy Framework

The odds of success for a school with a population that has lacked important opportunities are substantially increased if it operates in a supportive environment where its internal (school) and external (district, state, and federal) leadership are all pulling in the same direction. This is the central tenet of standards-based reform, a systemic improvement strategy first articulated in the late 1980s and subsequently spread through federal and state policy across the nation. In its original conception, standards-based reform encompassed three key components: *challenging standards* stating what students should know and be able to do for graduation and at different points in their schooling, a coherent system of *mutually reinforcing policies* designed to build capacity and focus to ensure that all students had access to opportunities to achieve those standards, and a *redesigned governance system* in which top-down direction was combined with bottom-up discretion, knowledge, and professional energy of school people and their communities (Smith and O'Day 1991). This early conception grew out of efforts of professional associations to professionalize teaching and define standards in the disciplines, research evidence on the limitations of top-down mandates that only intensified current practice, and an analysis of the ways in which a fragmented policy and governance structure hindered the spread of effective school-based innovations and overall improvement efforts. Equity goals have been at the heart of standards-based strategies since their inception, reflecting the belief that all students should have access to high-quality curriculum and instruction and that a coherent set of policies guiding instructional content, professional development, resource allocation, assessment, and accountability could stimulate and support change in that direction (O'Day and Smith 1993, 272).

Over the past two decades, stimulated in part by federal action in ESEA and Goals 2000 legislation, all states have adopted standards and have instituted at least some degree of policy alignment to those standards. Most are currently in the

process of shifting to a new generation of college and career-ready standards that better reflect the depth of knowledge and skills needed in the fast-paced and complex world of the twenty-first century. Indeed, the notion that states should articulate and use content standards to guide their education systems—unheard of in the U.S. before the 1980s—has now become conventional wisdom. The pervasiveness of some form of standards-based reform at the state level not only makes it difficult to envision a system in the near future without such standards; it also provides a plausible explanation for at least some of the achievement gains and gap closings observed in the NAEP and TIMSS results cited earlier.

Yet standards and aligned policies are not enough. While systemic in nature, standards-based approaches have fallen prey to many of the same implementation challenges we discussed above for more piecemeal efforts. Early emphasis on support for capacity building, for example, never fully materialized or was not sustained in most jurisdictions. And the notion of an altered governance structure that would allow for context-embedded solutions and responsiveness gave way to an almost singular focus on accountability and top-down mandates (many of them federal) during the No Child Left Behind (NCLB) era. The Obama administration's use of the waiver process to allow for greater state flexibility does not adequately address this problem, for while changing some of the parameters of the NCLB requirements, the Department of Education has maintained the strong focus on accountability as a central lever for change. It has even extended the accountability emphasis to single out test-based teacher evaluation as the favored approach for improving teacher quality (see Jennings 2015 for a fuller discussion).

We continue to believe that a state-level systemic approach based on thoughtful and challenging content standards can provide a scaffolding and structure for the academic activities of schools and classrooms. Multiple states provide existence proofs for this assertion. In addition, within this general approach, we see the Common Core and Next Generation Science Standards as significant and positive steps forward, both because of the content of the standards themselves and because of the potential for collaboration and mutual learning across states.[23] In particular, the increased emphasis on using language orally and in written form and the focus on depth and understanding rather than on algorithms can provide a stronger base for students to successfully enter the environment beyond schooling than is presently offered in most schools.

Yet the promise of the standards to improve overall system quality and reduce disparities for poor students and students of color cannot be realized without focused and persistent attention to implementation and the processes of change and system improvement.

[23] Even with the political pushback against the Common Core State Standards per se, we see a trend toward greater depth and commonality in the standards across states. We expect for a large majority of states this trend will hold.

A Continuous Improvement Approach

The second core element of a high-quality system is the simple but demanding concept of continuous improvement, which is a logical extension of our earlier observations about the importance of contextual conditions and systemic contributors to the success of any effort to improve outcomes for traditionally underserved students. An outgrowth of W. E. Deming's work in Japan, continuous (quality) improvement has been a focus for research and organizational change efforts in both public service and private industry for decades. A recent comprehensive review of this work identified five core features of quality improvement across a variety of approaches:

1. It is focused on system outcomes for a defined population of beneficiaries—*and* on the processes that lead to those results;
2. It uses variation in performance (including "failure") as opportunities for learning and improvement;
3. It takes a system perspective, with the understanding that systems are designed to get the results they produce, so if you want to change the results, you have to change the system;
4. It is evidence-based, including measurement of not only outcomes but processes (and resources), and this measurement is embedded in the day-to-day work of the system and its participants: and
5. It involves a specific and coherent methodology and processes. Some of the more familiar methods include PDSA (Plan-Do-Study-Act) cycles, "Six Sigma," and "LEAN."[24]

While specific methodologies differ, continuous improvement processes generally start with identification and analysis of a problem of practice in the given system, followed by repeated cycles of inquiry in which a plan for addressing that problem is developed, tested, revised based on data, and then implemented more broadly (or retested anew), followed by new data and more refinement. Most authors discuss quality improvement as a necessarily ongoing activity, often involving multiple cycles over periods of 7–10 or even more years to address major performance problems. For Tony Bryk and his colleagues at the Carnegie Foundation for the Advancement of Teaching, a critical feature of an improvement approach is not simply the repetition of the cycles of planning, action, and feedback but also the integration of continuous improvement processes into the *daily* work of individuals *throughout* the system.[25] Collaboration and active involvement of system participants allows for more effective individual and organizational learning, diffusion of promising practices, and adaptation to changing conditions (both internal and external)—all aspects of the implementation challenges discussed earlier. Such collaboration has repeatedly been identified as a central feature of more effective schools

[24] See Park et al. (2012) for a review and synthesis of the continuous improvement literature. For a more detailed treatment, see Langley et al. (2009).

[25] See Park et al. (2012) and Bryk et al. (2011) for more detail on the conceptual underpinnings of the promising work of the Carnegie Foundation for the Advancement of Teaching.

and districts (see, for example, Purkey and Smith 1983; Sykes et al. 2009). When expanded across systems in what the Carnegie Foundation calls "networked improvement communities," such collaboration allows for collective examination of both common and context-specific patterns of change and adaptation (Bryk et al. 2011).

Continuous improvement approaches have been put to productive use in many sectors and have had a particularly profound impact on improvement of health care organizations, both in the U.S. and internationally.[26] One longer-term example in education is that of the Long Beach School Unified School District in Southern California, which has been consistently applying these concepts over the period of two decades with a focus on increasing outcomes for traditionally underserved students, who make up over 70 % of the student population.[27] That work has been documented in three case study reports published by the Harvard Business School since 2006.[28] Winner of the prestigious Broad Prize in 2003 and a finalist in 2007 and 2009, Long Beach has also recently been named as one of the top three school systems in the country by McKinsey & Company in terms of sustained and significant improvements. The impact of those improvements can be seen not only in overall gains in student achievement and graduation but in narrowing of gaps over time: gains for the district's African-American, Latino, and poor students on the state's Academic Performance Index between 2002 and 2012 were approximately 50 % higher than those for Whites.

[26] See, for example, the work of the Institute for Healthcare Improvement (IHI) at http://www.ihi.org/Pages/default.aspx

[27] One small example of how this process works in Long Beach is the development of the district's K-8 mathematics program over an eight-year period. The approach began in 2003 when a single teacher (Si Swun) applied the principles of Singapore Math to his own fifth-grade classroom, with remarkably positive results. Singapore Math combines the development of students' conceptual understanding of mathematics with the automaticity of basic math facts and procedures. Within a year, other teachers in his school were adjusting their math instruction in similar ways, also to good effect. The district decided to test out the approach in other contexts, first in fifth-grade classrooms in five high-need schools. Based on positive results in these schools, the pilot program (entitled MAP^{2}D) was spread to 15 schools, with expansion in several of these to second and third grades. The testing and expansion to new schools and grades continued over the next several years until the district had enough data to warrant full implementation across all elementary schools. In addition to teachers and schools following the progress of their own students, the district research office conducted a quasi-experimental evaluation of the implementation and effects of the program. The first evaluation report, based on 2005–2006 data, found that the students in the MAP^{2}D classrooms were scoring significantly and substantially higher than comparison students and almost as well as students of higher socioeconomic status in other schools. Subsequent evaluations bolstered these findings. In 2009, Long Beach partnered with Fresno Unified School District to expand the approach beyond the elementary grades into middle school, assessing the results across the two systems and revising the process. For an evaluation of MAP^{2}D in Long Beach, see Anderson and Gulek (2008); for details on the partnership in mathematics with Fresno, see Duffy et al. (2011).

[28] See the three case studies of varying aspects of Long Beach's work during this extended period—produced by the Public Education Leadership Project of Austin Harvard University's graduate schools of education and business: Austin et al. 2004, 2006; Honan et al. 2004.

Next door to Long Beach is Garden Grove. In a variation of the strategy, over a 14-year period, Garden Grove has focused on improving its human capital in all areas of the district to similarly positive results (Knudson 2013). Other documented district examples include Union City, NJ; Montgomery County, MD; and Hillsborough and Orange Counties, FL (see, for example, Kirp 2013). The Sanger School District in California's impoverished central valley demonstrates these principles for a smaller, mostly rural district (David and Talbert 2013).

These are only a few of the U.S. examples. At the state level, Massachusetts and Texas fit the pattern of a sustained effort based on evidence to improve all parts of the system. And internationally, much has been written about the improvement processes of Finland, Singapore, and the province of Ontario in Canada. Two key questions emerge that are particularly relevant for our discussion of equity.

Continuous Improvement (CI) and Outcome Accountability

The most obvious question is how a continuous improvement approach differs from typical school and district accountability models instantiated in NCLB and other common policies (Hargreaves and Braun 2013). After all, outcome accountability also focuses on the application of data to identify where things are not working—and particularly where they are not working for traditionally underserved students. For example, the reporting of student outcomes disaggregated by historically significant subgroups has been a main contribution of Title I legislation since 1994. However, we see at least four fundamental differences that distinguish an accountability-based approach and a continuous improvement approach.

First, accountability-based models usually focus exclusively on collecting and analyzing data on student outcomes. But without systematic information about the antecedent processes, teachers, schools, and districts will have difficulty connecting those outcomes with their likely causes; nor will they be able to meaningfully assess the impact of actions they take to alter those outcomes.[29] By contrast, the focus in CI is on the improvement of practice, and so detailed information about particular practices is part and parcel of the analytic method. Moreover, the analytical methods employed are specifically designed to facilitate meaningful connections between processes and outcomes.

A second difference between the two approaches is the perspective on failure. In CI, mistakes and failures are expected; they are both the basis for identifying the focal problem of practice and are opportunities for collective learning about how to make things better. In addition, frequent, rapid cycle tests of possible solutions also help to minimize harmful mistakes when the knowledge base for any particular problem or remedy is weak. By contrast, failure and mistakes in typical accountability systems are more frequently opportunities for blame and negative consequences than for assistance and learning. As a result, participants often try to hide problems rather than address them openly and may even "cook the books" to avoid

[29] See O'Day (2008) for a more complete discussion of this issue.

recriminations and penalties. The test cheating scandals in which teachers and administrators change student answers to "improve" their scores are reflective of this problem.[30]

The approach to context is a third difference. Accountability models typically mandate not only the targets and measures but also the solutions to unsatisfactory outcomes, irrespective of their appropriateness for a given context—and often irrespective of the strength of the evidence behind them. In continuous improvement, all solutions are contextualized, and trials across multiple contexts provide information about which solutions are likely to work for whom and under what conditions.

Finally, the two approaches differ with respect to the primary source of accountability. In most education systems today, accountability is something that comes from outside the school or district. Local actors have not been involved in setting their goals or often even in determining their strategies. In continuous improvement, while there may be some externally determined targets, the primary source of accountability is internal among members of the organization and its clients and focused on the practices and feedback loops they have put in place. Case studies of low-performing schools conducted by Consortium for Policy Research in Education researchers found that this internal accountability distinguished those schools that were able to improve their performance over time from those that did not (Abelmann et al. 1999).

Continuous Improvement and Equity

A second question particularly relevant to the topic of this chapter is whether a continuous improvement approach will actually lead to reductions in opportunity and outcome gaps among students. While we believe that such an approach will foster the *conditions* under which strategies for reducing disparities can be most successful, we would argue that addressing these inequalities must be an *explicit* goal of the system for this to happen in a systematic way. The case of Montgomery County, MD, provides an example of how this process works in practice.

When Jerry Weast became superintendent of the Montgomery County district in 1999, he instituted a continuous improvement approach to address the large and nationally comparable gaps between White students and their African-American and Hispanic counterparts. GIS mapping of regions in the county that were high poverty, high minority, and low achieving provided a graphic catalyst for community-wide dialogue about educational disparities and race. Discussions across the district helped to identify structural contributors (like course placement policies in high school that tended to keep Hispanic and African-American students from higher-level courses because they lacked the prerequisites) as well as adult norms and attitudes that prevented full access for some students. Multiple sources of data—including frequent "walk through" observations using formal protocols in individual

[30] See, for example, Fair Test's 2011 fact sheet on these issues: *Tests, Cheating and Educational Corruption,* http://fairtest.org/sites/default/files/Cheating_Fact_Sheet_8-17-11.pdf

school sites—helped district leaders to identify particular manifestations of unequal opportunity and to design interventions such as full-day kindergarten, small classes, and rigorous curriculum models, which they targeted to high-poverty schools. They monitored for success of these actions over time while creating a system-wide culture of collaboration focused on both excellence and equity. By the end of Weast's 12-year tenure, Montgomery County had significantly reduced gaps among racial groups across multiple performance indicators: achievement on state tests in elementary school, completion of algebra in eighth grade, SAT and Advanced Placement (AP) results, and high school graduation. Indeed, the county posted higher AP participation and success rates for African-American students than the nation did for students as a whole (Weast 2014).

Similar examples of a focus on equity and access within a process of continuous improvement can be found in most of the districts previously mentioned. In Fresno, for instance, a six-year partnership with the University of California has produced sophisticated data systems to uncover disparities in course-taking patterns and other opportunities for underserved students, which the district and its partners have systematically addressed with substantial success through ongoing work with school counselors, principals, and district administrators. Less than 200 miles away, the Oakland Unified School District has been working with local funders and nongovernmental organizations (NGOs) to monitor and address disparities for African-American youth in seven areas through the African-American Male Achievement Initiative. Based on data collected and analyzed by the district and the Urban Strategies Council, the initiative focuses attention to students' developing identity, social emotional health, and academic learning to reduce achievement and graduation gaps, increase attendance, and eliminate disparities in disciplinary actions and incarceration. In these and similar cases, continuously improving districts explicitly and systematically interrogate their data to ferret out disparities that might not be immediately apparent, collaborate to tease out potential root causes and devise strategies, and test and evaluate those strategies over time.

Targeted Strategies to Reduce Inequalities: Four High-Leverage Approaches

As these examples demonstrate, a great strength of embedding continuous improvement into the fabric of a school system is that the system can more readily identify gaps in outcomes and opportunities among students and efficiently target action in those areas. These include ongoing monitoring of access to such resources as qualified teachers and teacher time, advanced courses, and appropriate and high-quality instructional materials as well as elimination of disparities in disciplinary actions and extracurricular opportunities. In this section, we highlight four high-leverage arenas in which such targeted attention and action for students can help to level the playing field and substantially reduce within-system inequalities. They are

development of a physically and emotional safe school environment; a strong emphasis on cultivating robust language capacities in all students; a methodology (tiered instruction) for systematically thinking about the nature and intensity of interventions; and attention to key transition points that may be particularly difficult for disadvantaged youngsters to traverse and require special interventions.

Ensuring Safe and Supportive School Environments

Safety is one of the first things that parents think about when their child goes off to school. Schools in high-poverty neighborhoods are much more likely to be unsafe. Minorities and "different" children often face emotional and physical safety problems in all schools.[31] At a basic level, physical safety and protection from outside influences capture the public discourse, and districts and schools across the country use a variety of approaches to ensure that safety. We address here the issue of physical and emotional safety in terms of conditions and actions inside the school.

The idea of supportive school culture and climate has been an important element in the school reform discourse for years. Such an environment supports not only a positive place to work but also a more effective organization.

Recent research has broadened this concept to focus on a broad span of social–emotional skills and dispositions of students and adults that support productive interaction and respect for everyone in the school. These skills and dispositions are captured in the research on Social-Emotional Learning (SEL)[32] and undergird the development of a school with a physically and emotionally safe environment. SEL is the label for a growing movement throughout the U.S. for schools and districts to move beyond a narrow focus on academic content and skills.[33] It emphasizes five interrelated sets of cognitive, affective, and behavioral competencies: self-awareness, self-management (often called self-regulation), social awareness (including the capacity for empathy), ability to establish and maintain healthy and rewarding relationships, and responsible decision-making. The competencies provide a framework for specific and detailed interventions such as the "Second Step" and the "Steps to Respect" programs.[34]

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[31] See, for example, Lippman et al. 1996; Erica Weiler 2003, "Making School Safe for Sexual Minority Students," *Principal Leadership,* June, http://www.nasponline.org/resources/principals/GLBQT%20Safety%20NASSP%20December%2003.pdf

[32] For a deeper discussion of SEL, see the website of the Collaborative for Social and Emotional Learning (CASEL) at http://www.casel.org/social-and-emotional-learning/outcomes/. See also the website for PromotePrevent, http://sshs.promoteprevent.org/publications/prevention-briefs/social-and-emotional-learning

[33] States are taking account of SEL. For example, Massachusetts has a set of guidelines for implementing SEL. See http://www.doe.mass.edu/bullying/SELguide.pdf

[34] For a review of the research on social-emotional learning and Second Step, see the Committee for Children website at http://www.cfchildren.org/Portals/0/SS_K5/K-5_DOC/K-5_Review_Research_SS.pdf

Schools that pursue these goals do so explicitly: Students and parents are regularly engaged, and teachers work to ensure that classroom behavior and opportunities meet the goals of SEL. This kind of focus takes time and energy to implement well but it seems to be worth the effort. A rich literature of studies provides clear and positive evidence on many of the SEL dimensions. For example a recent meta-analysis of SEL's effect on achievement found an average gain of 10 percentile points while other studies have found clear positive effects of SEL interventions on areas such as bullying.[35] The implementation of SEL in a school can do more than change the ways that students behave in classrooms and the halls. It also creates an environment where students can be different from the norms established by advertisements and video. It can change the way people think about each other.

The components of SEL are exemplified in the use of "restorative justice," or "restorative practices," a set of principles and practices focused on promoting respect, taking responsibility, and strengthening relationships.[36] The idea of restorative justice has a long history in areas other than schooling and in a variety of cultures. It changes the focus from punishment to repairing harm. In many schools, instances of bullying, fighting, and threatening have led to disproportionate numbers of students of color and males being subjected to punitive discipline—suspensions and expulsions—that remove them from instructional settings. Restorative justice deals directly with this issue. Oakland and San Francisco have made restorative practices key components of their equity and improvement agendas.

Developing Language Skills

> The limits of my language means the limits of my world.
> —Wittgenstein

Language development is affected by everything that happens to a child—from the mother's prenatal nutrition and habits (smoking, drinking, drugs) to language use in the home, including whether the child is read to or expected to ask and answer questions and engage in extended dialogue. The well-known Hart and Risley study (1995), comparing children in poor, low-income, and middle-income families, found huge differences in the amount and quality of expressed and understood language, favoring the children in the more advantaged families.[37] The literature on preschool and language development is clear. Young children living in poverty who have not attended preschool are very likely to be behind in their language develop-

[35] For a meta-analysis of the multiple effects of social-emotional learning interventions, see Durlak et al. 2011.

[36] For a review of the effects of restorative justice programs, see Latimer and Kleinknecht 2000. For additional description of restorative justice and its relation to SEL, see the report of the Restorative Practices Working Group at http://www.otlcampaign.org/sites/default/files/restorative-practices-guide.pdf

[37] See Hart and Risley (1995). See also http://www.naeyc.org/blogs/gclarke/2013/10/new-research-early-disparities-focus-vocabulary-and-language-processing

ment when they enter kindergarten. Students in this situation should be carefully monitored as they learn to read, with special attention to broadening their vocabulary and increasing their facility and comfort with the academic language of the schools. If the interventions come early and with sufficient intensity, the odds are good that students will gain the necessary skills and breadth of language that they need to succeed educationally. The new evidence of robust and positive long-term effects of Head Start is particularly promising in this regard.[38]

Once in school, students continue to learn conversational and academic oral English through the first years of schooling as they are also learning how to read and comprehend text. Without a strong language base, reading comprehension in the higher grades is a great challenge. By middle school, the teachers in the content areas assume that a student can understand the language in the classroom, integrate knowledge with past experience, and understand complex literary and nonfiction texts. Secondary teachers often have too little time and too many students to systematically identify and help students who are struggling to keep up.[39]

The need (and opportunity) for strong language development has been intensified by the college and career-ready standards recently adopted by most states. These standards emphasize learning to use oral language to explain answers to problems, make a logical argument based on evidence, interpret text, and retell stories. Academic language is part of word problems in mathematics and in science explanations. History, as told in books, movies, or video, is a matter of understanding a complex story; without strong language skills a student struggles. The assessments for the Common Core mathematics standards contain problems with large "stems"—two or three paragraphs of setting out the problem before the questions are posed. Even in math, the capacity to understand the language of the problem is critical to knowing how to set up and execute its solution (see Bransford et al. 2015; Snow et al. 1998).

For students who come to school speaking a language other than English at home, language development takes a particular form and challenge. On the one hand, the research is pretty clear on the cognitive benefits of bilingualism for all students.[40] In addition, in an increasingly global economy, students with native fluency in other languages and cultures can be a wonderful national resource. On the other hand, English language learners (ELLs) in schools face the double challenge of learning increasingly sophisticated and demanding content and learning a new language at the same time. Combining instruction in their native language with instruction in English can be an effective way to increase acquisition of English, ensure higher levels of content learning, and enable maintenance and development

[38] For a general discussion of the effects of Head Start and other early childhood programs, see Heckman 2011. For long-term effects, see Deming (2009) (http://www.people.fas.harvard.edu/~deming/papers/Deming_HeadStart.pdf) and Gibbs et al. (2011) (http://www.nber.org/papers/w17452.pdf).

[39] For a delineation of these issues, see Johnson et al. n.d.; Vaughn et al. 2008.

[40] For reviews of the research on the cognitive benefits of bilingualism, see Goldenberg (2008) and Bialystok (2011).

of ELLs' native languages. Bilingual education—particularly dual immersion programs—can also spread the benefits of bilingualism to native English speaking students.[41] Making it possible for students in low-income areas to be in bilingual classes whenever they enter the U.S., but especially in the early years, would be challenging to accomplish but well worth the effort.

Implementing a Tiered Approach to Intervention

Response to Intervention (RTI) is a three-tiered methodology that provides a structure for teachers to select and implement an appropriate intervention for a student or students who require special attention.[42] Without some well-organized and defined strategy, students will slip through cracks. One major goal of RTI is to address problems very early to reduce the odds of students experiencing failure.

The first tier of RTI is a well-organized and effectively implemented curriculum and inclusive instructional approach: All students are involved and expected to be mastering the content, and instruction is specifically designed to address the wide range of learner needs, strengths, and backgrounds.[43] Regular monitoring of student learning is a critical aspect of first-tier instruction, with the goal of addressing problems or barriers to learning before they become serious. Interim assessments can play a role in this monitoring but are often not timely or fine grained enough to enable the teacher to respond effectively to individual student needs. More critical is the teacher's capacity to observe how well students are learning the material on a minute-by-minute and day-by-day basis through the use of formative assessment and observation along the lines described by Black and Wiliam (2009). Black and Wiliam see this process as continuous, with the focus on preventing students from long-term confusion or withdrawing their attention from learning. With a strong core instructional program that is inclusive and incorporates formative assessment practices, 75–80 % of students can be sufficiently served.

The second tier of RTI is for students for whom the core program is insufficient; that is, for those who regularly do not seem to be keeping up or who consistently lose attention. This could be due to not having the background to understand the material, to something going on in their lives outside of the classroom, or even to losing confidence in their capacity to learn the content. When a teacher observes a student struggling in class, his or her response will depend on that teacher's own capacity and on the resources available in the school. If initial adjustments to the

[41] For effects of two-way bilingual education, see for example, Marian et al. (2013).

[42] For a definition and description of RTI, see the RTI Action Network website, http://www.rtinetwork.org/learn/what/whatisrti

[43] One approach to developing a truly inclusive first-tier instructional approach is to follow the principles of Universal Design for Learning (UDL). According to its creators, UDL "drew upon neuroscience and education research, and leveraged the flexibility of digital technology to design learning environments that from the outset offered options for diverse learner needs." For a detailed discussion of the variability of learners and the UDL approach, see Meyer et al. (2014).

core instructional program (Tier 1) don't have an effect, more intensive intervention may be necessary. For example, a possible second-tier approach for students having trouble learning to read may be remediation by a tutor such as a Reading Recovery specialist.[44] The degree of intensity is an important decision, as is the nature of the intervention. For students who have lost (or never had) confidence in their capacity, one of the strategies suggested by Carol Dweck (2006) in her Mindset research might be appropriate.[45] Nationally, approximately 10–15 % of students may require the second-tier interventions to supplement the regular instructional program. These numbers may well be higher in high-poverty schools.

The third tier of intervention is more intensive and responds to a continuing problem that could not be effectively addressed through other interventions within the regular classroom. It could entail a meeting to consider providing the student with special services under a federal 504 plan or even an individualized educational plan (IEP).[46] Prior to that, however, there should be a set of second-tier services and appropriate support and analysis of the student's problems.

Attending to Transition Points

RTI provides a framework for intervention at all levels of schooling. Without careful and well-implemented interventions, too many students, especially those from low-income families, will fall through the cracks, lose confidence about how they are doing in school, and try to avoid notice until they are old enough to leave school. The problems can come at any time during a student's educational career.

Yet there are predictable times during a student's voyage through school when problems are both more likely and particularly consequential for future success.[47] Often these critical points occur during major transitions in a student's schooling and are especially problematic for traditionally underserved students. For many of these transition points, there may not be an individual teacher or other adult in a position to be aware of problems; targeted support systems to help clear students' paths during these times are thus critical.

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[44] For general information on Reading Recovery, see the Reading Recovery Council website http://readingrecovery.org/reading-recovery/teaching-children/basic-facts. For evaluation findings, see Consortium for Policy Research in Education (2013).

[45] The studies and interventions used by Carol Dweck seek to change students' mindset from believing that their intelligence is fixed and determines their school performance to one where they believe that if they work harder, study more, and pay greater attention in school their grades would increase. For a description, see Dweck (2012).

[46] For detailed description and delineation of differences between 504 plans and an IEP, see Understood Team, *The Difference between IEPs and 504 Plans,* http://www.ncld.org/students-disabilities/iep-504-plan

[47] See Kieffer et al. (2011). For a consideration of transition from middle school to high school, see Kathy Christie and Kyle Zinth, "Ensuring Successful Student Transitions from the Middle Grades to High School," http://www.adlit.org/article/32116/. Also see Neild (2009).

The first major transition occurs in kindergarten. A child who comes into kindergarten having had rich language experiences, having developed self-regulatory behaviors, liking to count, and able to share will do well in school. Note that SEL skills are particularly important. Alternatively, if the child missed the opportunities to build these competencies—for example, if he or she never had preschool experience or opportunity to develop these skills in the home—the child may struggle. A child lacking these experiences and skills may not show clear indications for a while, but signs of insecurity, frustration, difficult classroom behavior, and data from diagnostic instruments should alert teachers. Students from low-income homes are disproportionately likely to enter school with some of these challenges as more than half do not attend preschool. In some schools a teacher may be overwhelmed and unable to adequately treat every student, but a school that uses an SEL model and systematically practices a form of RTI is likely to be ready for this. In effective kindergartens in high-poverty schools, students take diagnostic assessments of their language and other skills very early, and there is a regular and systematic approach to working with the students and possibly their parents to catch up. In many chaotic elementary schools with new or poorly trained kindergarten teachers, however, few such supports exist.[48]

A second major transition point occurs toward the end of third grade. The expectation in American schools is that by this time students will be comfortable reading appropriate texts, gaining information from them, and demonstrating their comprehension of the material they have read. The shorthand for this expectation is that prior to fourth grade students learn to read; from fourth grade on, students read to learn. What this means instructionally is that in many schools the intense focus on learning to read subsides in fourth grade, and students who have not mastered comprehension skills and strategies will likely struggle to keep up. We see two implications of this pattern. First, it is critical that all students receive high-quality reading instruction and rich language experiences prior to fourth grade. Second, for those who haven't, a well-designed RTI second-tier intervention must be available to remedy the gaps.

The moves from elementary to middle and middle to high schools are other major transition points in a student's educational career, as is going from secondary school to a community college, four-year college, or to work. In each of the transitions, the rules and expectations for students change. For example, in the move from elementary to middle school, students must suddenly negotiate the rules and personalities of a half dozen teachers rather than one, the stakes are higher, and the academic demands—including homework—are much greater. Moreover students at this age change physically, and the impact of their social world intensifies, now

[48] Large numbers of students with these issues might signal the need for more interventions at home. Nongovernmental organizations such as Home Instruction for Parents of Preschool Youngsters (HIPPY), provide information about alternative interventions or strategies that might be used to provide support to parents and, through them, to students. Organizations such as "Too Small to Fail" provide advice and guidance. See the HIPPY USA website at www.hippyusa.org/ and the Next Generation website at http://thenextgeneration.org/tags/too-small-to-fail

aggravated by social media. These changes may be especially challenging for students who lack support at home and may lead some to decide that school is not worth the effort or not relevant to their lives. In addition, pressures and dangerous alternatives outside school can capture students' attention and provide less constructive kinds of social and emotional support. Having a trusted adult at school or in the community, with whom a student may honestly and openly discuss problems and plans, can help individual students navigate both the demands of school and the potholes of adolescent development. Unfortunately, such role models and trusting relationships with adults are too often lacking in schools, especially for low-income students of color. Small schools and learning communities, where students and teachers can get to know one another; advisory classes; and special initiatives like the Manhood Development Program in Oakland, CA, are examples of strategies that districts and schools have employed to help build the needed connections between students and caring adults.

There are also consequential decisions about courses that students and their teachers need to make in seventh, eighth and ninth grades to prepare for high school. If a student misses taking Algebra 1 by ninth grade, for example, the consequences are often considerable. Because of master-schedule problems in secondary schools, this can result in students being left out of the math sequence and out of the academic track. Some studies indicate that low-income and immigrant students without counselors or trusted advisors do not realize the importance of this sort of planning.

Ninth grade appears to be a particularly important year for academic intervention (Allensworth and Easton 2007). For this reason, some districts and states are implementing "early warning indicator" systems to identify ninth-graders who are at risk for dropping out. Based on research by the Consortium on Chicago School Research, for example, Chicago Public Schools adopted a "freshman year on-track indicator" and began providing schools with real time data about which ninth-graders were and were not on track for graduation as well as guidance on how to help students get back on track. A new report on this initiative indicates that Chicago's on-track rate rose 25 percentage points from 2007 to 2013, and that this increase occurred across all racial/ethnic groups, genders, and incoming achievement levels. What is more, the improvements were largely sustained in later grades, contributing to higher grades and increased graduation rates down the road (Roderick et al. 2014).

Another increasingly popular approach to improving graduation rates and better preparing students for transition to adulthood is to provide multiple pathways to graduation. All pathways are intended to prepare students for postsecondary opportunities, but they are designed to tap into varying student interests and real world realities (Symonds et al. 2011). More and more districts and schools are thus beginning to offer sequences of courses focused on occupational domains or issues in today's society. A student in one pathway might focus on health care; his or her math, science, and literature courses would reflect this theme. Another student might follow a pathway focused on the environment or the building trades. These pathways provide relevance and might also include opportunities for students to apprentice in their areas of interest (see Chap. 10). In many settings, the high schools

are connected to community colleges, which provide additional courses with the same pathway focus once the students have graduated from high school. Early-college high school programs make such connections even before graduation and have demonstrated success in rigorous studies of their effects for low-income students (Berger et al. 2010).

Finally on the transition theme, many students who graduate from secondary school and go on to college (including community colleges) find out they need remedial courses before they can take courses for credit. Nationally, the figure for such students is approximately 60 % of the incoming cohort (Southern Regional Education Board 2010). Many are low income or ELL. Most fail to pass the required exams and drop out before even passing one credit-bearing course. This pattern is costly and devastating for many low-income students and for local regions and whole states as well. Exemplars of successful approaches include that of El Paso, Texas, where the local districts, community colleges, and local university have worked together for years to ensure equitable access and success. Another approach is to focus on improving student success in gatekeeper courses within the community colleges. Recent work of the Carnegie Foundation for the Advancement of Teaching, for example, has produced a powerful technology-supported intervention for students in developmental mathematics courses in community colleges. Given these alternatives, the task may now be less a conceptual challenge than the political problem of making serious changes in the colleges (Yamada 2014).

Taken together these leverage points provide a crude template for schools and districts committed to not allowing any student to fail.

Beyond School: Connecting Schools with Services and Institutions in the Community

As we noted earlier, the entire environment in which students live influences their development and success in school. We have emphasized the importance of good medical care, healthy food, a supportive and language-rich environment, and at least a year of preschool as important preparation for academic learning. These conditions and other opportunities outside of school continue to be important determinants of students' success and resilience in school. While we have described the negative side of some of the poorest communities and neighborhoods, there are often NGOs, churches, and government agencies available and capable of providing support and services for the students during those 4500 waking hours outside of school.

Connecting schools with other systems is not a new idea in the U.S. In the early 1900s, John Dewey, Jane Addams, and others argued for schools in the cities to be the center of a neighborhood's life by being the center and provider for social life and services. Later on, the Mott family, working through their foundation in Michigan, supported schools that served multiple services, a model and philosophy

that spread through many parts of the country. In 1974, amendments to ESEA included the creation of a small grants program for Community Schools that enabled funds to support model community schools directly as well as state activities in support of community education. This program was ended in the consolidation of programs in 1982, but the federal government came back in 1997 to support twenty-first century After Schools programs and, more recently, twenty-first century Learning Centers.

In 2014, the Coalition for Community Schools held a national forum with 1400 participants. The coalition's concept is broad and includes making full use of the school (open all of the time) for the community, health services, and social services. This concept is often called the full-service community school program, and it has schools all across the nation. Using the school as a hub, a community school organization coordinates education and social service organizations all through the neighborhood, including businesses, colleges, adult education, family support activities, and other NGOs.

Another strong organization in this area is Integrated Student Supports (ISS), which is a school-based approach to promoting students' academic success by providing academic and nonacademic support services including tutoring, mentoring, linking students to health care and families to counseling, education, food banks, and employment. Integration around individual student needs is the key factor.

Perhaps the best-known example of the systemic community-based approach—and surely one of the most expensive—has been the Harlem Children's Zone (HCZ), which takes up a 100-block area in Harlem's largely African-American area of New York City. HCZ connects students and their families with the entire panoply of social and educational services; where services have not existed, the organization has raised the resources to create them. HCZ has even created its own small network of schools that admit interested students through a lottery process.[49] Recently the federal government launched a program of competitive grants called Promise Neighborhoods that is modeled after the Harlem Children's Zone; in the last four years, over 40 districts in the nation have received Promise Neighborhood grants.[50]

Other settings—such as Long Beach and El Paso—have focused on developing strong collaborations between their school systems and the local community colleges and public universities, particularly those engaged in teacher preparation and development. In Oakland, the schools host farmers' markets in neighborhoods with no grocery stores. And in Silicon Valley, the John Gardner Center at Stanford works with a number of communities to link data from local social service agencies and community-based organizations to identify patterns and gaps and to ensure that students needing service have access to what they need.

[49] See Wikipedia (http://en.wikipedia.org/wiki/Harlem_Children's_Zone) for a description and citations on the Harlem Children's Zone. Also, for a recent analysis that suggests that the schools in the Children's Zone are responsible for observed academic gains, see Dobbie and Fryer (2011).

[50] For information about the Promise Neighborhood awards, see the U.S. Department of Education website at http://www2.ed.gov/programs/promiseneighborhoods/awards.html

Studies of these and similar efforts generally find small positive or insignificant effects on school achievement. But the afterschool activities are often not well coordinated with the instruction that students receive during the regular school day. Some interventions—such as those that connect children with food and medical service, young adolescents with counseling, and schools with teacher training institutions—have a high degree of face validity, even if they do not have evidence of a direct impact on student achievement. An integration of the Gardner Center's data strategy with health, nutrition, and some basic academic and social support services would provide a neighborhood or community with what seems to be the critical core interventions of all of these general programs and a mechanism to make sure the system is working with the students who most need assistance.

The bottom line is that there is a lot of energy around these issues across the nation. The systemic nature of the interventions and the urgency of the need for the populations they serve make a compelling case for their existence in every high-poverty neighborhood. It appears to us to be very unlikely that the achievement gaps can be closed substantially without interventions that mobilize neighborhoods that lack resources for their children around a set of strategies that engage the community-based organizations, the local governments, and the private sector.

Getting From Here to There: The Problem of Change at Scale

This vision of a more equitable system addresses the key shortcomings of past and current efforts to reduce achievement and opportunity gaps. It provides a framework to promote and extend system coherence, embeds improvement efforts in specific systemic contexts, balances whole system change with targeted interventions for underserved and struggling students, and recognizes the importance of connecting schools with other organizations and agencies affecting children and their families.

But envisioning what might be a more effective system is one thing; moving in this direction and doing it at scale is something else. For this discussion we incorporate an observation from decades of implementation research: Effecting change requires a context-appropriate balance of pressure and support—pressure to engender action and support to increase its effectiveness (McLaughlin 1987). This observation about organizational and system-level change is consistent with theory and research on individual performance, which is generally defined as an interactive function of individual motivation, ability, and situation (Rowan 1996).

We see three potential sources of pressure and support to move educational systems in the direction we have suggested: governmental and administrative policy at the federal, state, and local levels; professional networks and norms; and community and stakeholder constituencies.

Designing Governmental Policy to Motivate and Support Improvement and Equity

Governmental and administrative policy at the federal, state, and local levels has been the predominant source of external pressure and support for educational change in the U.S.—particularly with regard to equalizing opportunities for poor students, students of color, and English learners. Over the past six decades, this source has generally become more centralized, with states providing an increased portion of school funding (and demanding greater accountability for how those funds are spent) and the federal government taking more of a role in not only enforcing equality but also influencing the core direction of schooling. With respect to the balance between pressure and support, the scales at these two levels have recently tipped toward pressure and compliance, though requirements are often tied to categorical funding streams that wear the guise of inducements and fiscal support rather than blanket mandates.

We have noted earlier how this emphasis on compliance can actually thwart improvement and lead to unintended negative consequences for underserved students, even when they are the intended beneficiaries. In addition, because policy is made at all levels of the system, schools are frequently confronted with a panoply of conflicting rules, overlapping programs, and fragmented directions that divert attention and prevent real change.

To move toward a system that facilitates continuous improvement where it matters most—in the schools—will require a reconceptualization of the roles of the three levels of government and a rebalancing of emphasis between pressure and support, with greater attention going to providing long-term support for improvement than has been the case in recent years. At the core of this reconceptualization are the twin principles of (a) common commitment at all levels to the goals of equal opportunity, achievement, and attainment, and (b) governmental restraint and focus to achieve these goals. By restraint we mean that each level of government must fully consider the likely tradeoffs and potential unintended consequences before it creates new rules, strong incentives, and/or legislation based on ideology, politics, or even some evidence of effectiveness. The question must be, will the proposed action actually motivate and support greater equity and higher quality, or will it disrupt ongoing improvement processes and stress the schools and the teachers?[51]

A first step for all levels of government on the road to help schools and districts to achieve the improvement and equal opportunity vision is to model the ideas of continuous improvement within their own operations and to reach out to create

[51] For example, when Congress passed the No Child Left Behind Act in 2001, it put in place a set of accountability provisions that no state could feasibly achieve (primarily that 100 % of all students would be proficient on the state standards-aligned assessments by 2014). The Obama administration has provided waivers from many of these provisions, thus giving states an alternative to designating all of their schools as failing. But the department predicated these waivers on state actions—such as using student test scores to evaluate teachers—that were not relevant to the substance and purpose of the waiver.

more collaborative environments with other levels of government and with other sectors that influence the quality and equality of educational opportunity. This will not be an easy task for bureaucracies that have been stove-piped and focused on regulating their clients rather than supporting them in their improvement efforts, but there are examples of some states that have been moving in this direction. At the federal level, the task will be even harder, given the current level of political polarization.

Assuming that reorienting the federal and state systems toward improvement is possible, we suggest below that each level of government has a distinct and important role to play in motivating and supporting movement toward both high-quality systems and equal opportunity.

Federal Role and Policy

As the 10th Amendment to the Constitution implies, the basic responsibilities and practices of delivering education are left to the states and districts. And, as the 14th Amendment provides, the federal government has a responsibility to protect and support when needed those who require assistance to receive equal opportunity.

Following from these constitutional provisions, a simple test for suggesting what the federal government should—and should *not*—do in K-12 education is to apply two criteria:

- Does the activity protect or directly support the U.S. constitutional and legislated rights of schoolchildren to receive equal opportunity to a high quality education?
- Does the activity apply to the entire nation and is it more efficiently and effectively delivered by the federal government than it would be by states and districts?

Implementing these criteria would reduce the current portfolio of the U.S. Department of Education and clarify its role around a more highly focused set of responsibilities. The reasons for such a reduction include the great diversity of U.S. students and school environments; the complexity of effective teaching and school management; and the all too real danger of ideology, politics, and regulatory zeal overriding useful evidence within administrations and the Congress. We suggest instead a federal role that works to ensure equity and provides resources but eschews the one-size-fits-all prescription of education practice to states, districts, and schools. This view of the federal role calls for increasing the resources and capacities for support of the programs and policies that directly influence equal educational opportunity.

The activities of our proposed new role may be organized into four groups: protecting and supporting the rights of all students to equal educational opportunity; ensuring equal opportunity for specific groups of students protected under federal law; providing financial resources to equalize educational opportunity for all

students; and supporting research, innovation, data about the health of the system and resources for improvement.

Protecting and Supporting the Rights of All Students to Equal Opportunity

The U.S. Office of Civil Rights (OCR) in the Department of Education has the critical function of enforcing civil rights laws affecting educational opportunity—such as the Civil Rights Act of 1964, the various desegregation decisions starting with *Brown v. Board*, Title IX, and Section 504 of the Disabilities Act. To achieve its mission, OCR balances the roles of enforcer/regulator with providing support to districts and schools to promote greater equity. Both approaches—reflecting the "pressure and support" functions mentioned above—are now part of the office's repertoire. As the climate of education reform changes to improvement rather than adherence to regulations, we suggest greater emphasis be placed on the support approach. This change in direction might require more resources.[52]

Ensuring Equal Opportunity for Students Protected Under Federal Law

Federal programs to support specifically protected groups of students include the Education for all Handicapped Act (EHA); Title III of ESEA, which supports the efforts to improve the teaching and learning of students whose native language is not English[53]; and the two programs for Native Americans, one in the Department of Education and the other in the Department of the Interior.[54] These programs differ dramatically in size, delivery strategy, and level of financial appropriation. Unfortunately, because legislative and regulatory environments tend to change slowly and protect vested interests, the programs do not necessarily reflect our new understanding of student learning and the opportunities that have appeared because of new emphases on innovation and strategies for improvement. An important step for each might be to have outside groups of experts and stakeholders carry out thorough and sustained (five-year) studies on how well these programs are working and to recommend changes.

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[52] See OCR website at http://www2.ed.gov/about/offices/list/ocr/index.html.

[53] Title III of ESEA, intended to support ELLs, should be substantially modified and retained as a symbol and a vehicle for capacity building and innovation. The past decade has provided a great deal of new research on approaches to teaching ELL students. We have now considerable knowledge about dual immersion and other approaches to bilingual education that suggest that students derive added benefits from learning two languages without losing effectiveness in either. The current instantiation of Title III limits the opportunities for states, districts, and schools to apply this new information in a systematic way and should be changed.

[54] Title XI Education Amendments of 1972 contains an anti-discrimination provision that protects women. There is no specific education program—the Office of Civil Rights in the Department of Education administers the provision.

Eliminating Resource Inequities—Title I and New Strategies

Title I of ESEA provides funds to high-poverty schools beyond the base of resources provided by state and local funding. The highest poverty schools receive funds to improve the entire school ("school-wide" schools). Less-high-poverty schools receive funds on the basis of number of students on free and reduced price lunch and then use these funds to help low-achieving students (targeted assistance schools). Title I is the best known and largest of the programs that serve the goal of equal opportunity. It has been the object of much political attention, partly because it provides a large amount of money targeted to poor and low-scoring students and partly because the Title I law carries requirements that all states must have academic standards and assessments and administer a federal accountability system to meet the requirements for receiving Title I funds. We propose to curtail the federal accountability provisions in the current version of Title I (NCLB) to include only two elements: reporting of disaggregated results by subgroups, which would continue to be a gauge of equality of opportunity, and a requirement that each state develop a system of accountability appropriate to its context that includes measures to motivate and support improvement and a reduction of achievement, attainment, and opportunity gaps.

The core and historical purpose of Title I would remain. The funds for Title I should be increased and more highly targeted toward high-poverty schools than they are now (over half the schools and almost all of the districts in the nation receive Title I funds), and many of the legislative and regulatory requirements on the specific uses of the funds should be eliminated. The comparability and supplement-not-supplant provisions should be maintained. In fact, in high-poverty schools, Title I should be able to operate as an accelerator of school reform that supports continuous improvement and interventions targeted to ameliorate specific student challenges as they journey through the school.

Even though Title I is a large program, however, it does not come even close to closing the finance equality gap. Any independent observer of educational opportunity in the U.S. would see three glaring and generally ignored sources of gross disparities of resources that favor the well-to-do in our nation. In the initial section of this chapter we pointed out the great differences in wealth and in the resources available to students among the states, among districts within states, and among schools within districts; as a nation, we tend to turn a blind eye toward these disparities. The only entity available to help reduce state differences in resources for public education is the federal government. Great variation of resources among districts within states would logically be a problem to be solved by states; again logically, the within-district, among-schools disparities would be remedied by the districts. However, in this section of the paper we opt to address all three levels of resource inequality. Our reason is that the federal government could play a substantial role in accomplishing progress toward equality in all three of the areas: among states, within states, and within districts. This focus would call for new activities and resources from the Department of Education.

A serious move toward equalizing resources among states, controlling for effort and wealth, would accelerate equal opportunity across the nation for many low-income students of all races. A goal might be to bring all states to at least the 50th percentile of the current average per-pupil expenditure among states by 2020. This would require new resources from the federal government, which should be partially matched by states. Particularly in the South, many states lack the financial resources and infrastructure to provide the money to support high quality and effective K-12 schools for all of their schoolchildren.[55]

Meeting the within-state (among district) variation in resource allocation is a somewhat different problem. Attaining equalization among districts should be part of the states' commitment to equal opportunity. Here the federal government might figure out how to motivate state efforts to adopt something like a weighted pupil formula.

The third leg of this fiscal equity stool would be to address within-district inequalities among schools. Here the federal government might take an immediate and powerful step. This approach would require a subtle but significant change to the comparability provision in Title I of the ESEA, a provision that requires the resources available to the Title I schools within a district to be comparable *on average* with the resources available to non-Title I schools. In the current provision, the resources are defined as "services," such as number of teachers. Because schools with large populations of students from low-income families often have younger and less experienced teachers (due to teachers moving to other schools and to teacher turnover), the total amount paid to teachers, and thus the total expenditures in these schools, are often less than in schools with more affluent populations. We suggest that the comparability provision should be changed to require districts to equalize *actual* expenditures per pupil instead of "services." A study by the Department of Education found that such a change in regulation could "bring a substantial increase in funding for low-spending, high-need schools" (Stullich 2011, 1). These extra funds would be used to improve the quality of the school, for example, by lowering class size or having reading specialists or counselors.

We are not naïve about the possibilities of enacting any of these three finance proposals. In a Congress where tax cuts are dominant, the idea of investing in the education of students in states other than the congressman's own state does not seem likely to find many advocates. And, even the third proposal, to alter the comparability provision in Title I, has been proposed many times and rejected, with some major education groups leading the opposition. Yet, these three actions, by themselves, would alter the calculus of inequality in the country. They would create huge new opportunities for millions of children and could even engender trust in the public that the rhetoric of equal opportunity is real.

[55] See Houck and DeBray (Forthcoming) for a thoughtful discussion of how the federal government might stimulate these equalization reforms.

Supporting Research, Innovation, and Data for Improvement

The Department of Education should also continue to carry out research and data collection and analysis, focused on improving teaching and learning and on innovation in areas such as technology. As a goal, the department's research efforts should move more toward theoretically driven efforts that carefully aggregate knowledge to increase our understanding of key issues in developing an effective education system for all students. The research results and data from government-funded research should all be as openly available as possible through a Creative Commons license to allow all researchers access to the new knowledge and for those interested to be able to use the data to replicate and possibly illuminate the original results.[56] Explorations into innovative ways of using new knowledge and opportunities made possible with technology should be a significant second focus of the research. A third area of activity involves the collection and analysis of data on the status of the system, which has been a function of the department since its original instantiation in 1867. Such data collection requires constant attention and improvement to provide the best possible information and data for researchers, policy makers, and the public to use.

This discussion of a more limited and focused role of the federal government implies a need to eliminate or consolidate a substantial number of current federal programs while refocusing others. We believe that such a consolidation should focus on two purposes. The first would be to support overall continuous improvement strategies in districts and schools; the second would be to kick-start within-district and among-district equalization strategies.

Role of State Governments to Ensure Quality and Opportunity

The basic roles of the states, granted to them under the 10th Amendment and built into their state constitutions and legislation, include responsibilities for all aspects of the education system from governance to finance to curriculum to supporting, enhancing, and monitoring quality education for all public school students in the state.[57]

[56] Preservation of anonymity and protection of human subjects can be more complex with qualitative data than with large-scale survey or assessment data, and demands for transparency and replication must be tempered by the feasibility of making these data available without jeopardizing the anonymity of particular individuals. See www.CreativeCommons.org for information about the Creative Commons licenses.

[57] States differ substantially in their political and administrative structures with respect to education. In some states, the state department of education exercises the primary leadership, policy, and administrative functions; in other states, the governor and state board of education have the primary leadership and policy roles. We refer to the state as a whole in this chapter, irrespective of which particular agency or branch of state government carries out a given function. Of course, similar variation in governance structure occurs at the local level; in some districts, the mayor has

In general, states delegate many of their responsibilities to local districts through legislation and their constitutions. They maintain full control of the responsibilities to actively build and monitor a legislative and regulatory framework that guides the districts as they implement much of the remainder of the responsibilities. States are responsible for decisions about common statewide content and performance standards, assessments, accountability, data collection requirements, and regulations about certifying and training teachers. They also manage and provide oversight for federal and state categorical programs. The financing of public education is generally shared, but state legislation or constitutions determine the framework for the finance system. Local districts manage the fundamental tasks of teaching and exercising the day-to-day responsibilities for educating the youth.

An unfortunate fact is that states and local governments and schools have implicitly or explicitly discriminated against low-income individuals and those of color in schools for well over a century. We have documented gaps between rich and poor schools and districts in finance, in prepared teachers, and in other materials in schools that provide clear evidence of these practices.

In order to move resolutely toward the goal of equal opportunity for all, states must develop, maintain and improve well-functioning education systems that support continuous improvement and high quality teaching and learning for all schools and students throughout the state. If the system is dysfunctional, the least advantaged among us will suffer the greatest.

We suggest three broad roles for the state in motivating and supporting educational quality and opportunity for all students:

- Establish a vision and set of priorities for educational improvement in the state—that is, to set the direction
- Provide resources and infrastructure to support continuous improvement toward this vision
- Establish a fair accountability system that stimulates action and tracks progress—particularly progress towards equity

Setting the Direction: State Standards and Priorities

We have already noted that robust and challenging standards for what students should know and be able to do can serve to define equity goals and guide continuous improvement toward those goals. Adoption and support for district implementation of new generation standards and assessments and establishing aligned policies to help guide curriculum development, educator training and accountability is an important role for states. As states transition to new standards and assessments and work to make the necessary changes in other parts of the system, it is especially crucial for them to pay attention to low-income districts, schools, and regions of the

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substantial authority while in most others the superintendent and the local board are in charge. Again, we focus on the level of the system in general rather than on the roles of specific actors.

state that have fewer resources than others to carry out implementation. Analysis of statewide data can help states set priorities for moving forward to ensure that all students have access to the standards.

But standards and priorities are only one step toward setting direction for the state. Equally important is ensuring consistency in the signals to local districts and schools through consistent leadership and sustained commitment to improvement. This has been and continues to be a major challenge in the majority of states. All too often, state leaders do not have a deep understanding of the nature of the problems; state bureaucracies are locked into patterns that are directive and punitive rather than supportive; and lobby groups work to maintain current practices, often by guiding the votes of legislators and the behavior of the administrators. These practices will not change quickly, but they can be ameliorated over time. Though not yet fully successful, leaders in states such as Massachusetts, Connecticut, Minnesota, Texas, and now California have made substantial progress. The key is sustaining the work over time. One- or two-term leadership is not enough; change of the sort we describe here takes a decade or more to embed itself into the fabric of the system. The task is not easy—the commitment to sustain a policy direction that is based on continuous improvement and equal opportunity is difficult to keep up without succumbing to the siren call of "magic bullets." But it is necessary. And we suspect that strategic mobilization within the profession and among community stakeholders will be necessary to reach a common vision and ensure that state governments actually stay the course (see below).

Providing Resources and Infrastructure to Support Continuous Improvement and Equity

Standards and commitments will, of course, be meaningless without action to back them up. One of the most important roles for states to play is to provide the resources and build the infrastructure necessary to support local capacity for improvement and equity. We highlight three arenas in which state resources and infrastructure are most important: human capital, finance, and data.

A Strong Professional Workforce

Many states face serious human capital issues that hold back improvement and perpetuate inequity. These include teacher shortages, inadequate pre-service training, limited capacity of current teachers for teaching the new content or teaching all students, and a limited supply of well-trained principals. Moreover, the challenge of creating and maintaining a continuous improvement environment and implementing a thoughtful intervention system requires changes in the responsibilities of educators throughout the system. Education systems cannot provide high-quality schooling for all students without high-quality education professionals. The costs of

building professional capacity may seem high, but the cost for not doing so is far higher.

States are in a critical position to ensure all students have access to high quality and effective school personnel. A first step is to support the recruitment of talented and interested people to enter the profession. Currently many young people do not see teaching as a desirable option because of a political atmosphere that seems to target teachers, relatively low pay, perceived job insecurity due to uncertain budgets and high-stakes accountability, and the poor reputation of teacher training programs.[58] State political leaders can join with university presidents and others to use the bully pulpit and incentives to upgrade the quality of pre-service training and increase the attractiveness of teaching.

A second step is to create the conditions for teachers and principals to grow in their jobs. High-quality mentoring in the first two years shows solid effects, and we have learned much in the past two decades about designing effective ongoing professional learning. A substantial new body of evidence, for example, indicates that both human and social capital are critical to the development of high-quality teachers and schools (Hargreaves and Fullan 2012). States can provide support to build a strong statewide infrastructure for professional development, including the creation of networks among teachers, schools, and districts. This is particularly important for low capacity and isolated regions of the state to ensure equity.

Finally, a critical role for the state is to ensure equitable access for all children to high-quality teachers. Specific tenure and seniority provisions in some state laws may exacerbate the low quality and ongoing churn of educators in schools and districts serving high needs students. The recent *Vergara* lawsuit in California was predicated on the idea that there is a set of laws and practices that systematically ensure that poor children, on average, have the least qualified and experienced teachers.[59] Whatever one's position is on the lawsuit per se, that the state has a role in ensuring equitable distribution of high-quality teachers should be undeniable. A first step would be to review potential disparate impact of policies currently in place and to improve working conditions in high-poverty schools.

The implications of not meeting these challenges will fall most heavily on the students most in need. The well-to-do communities of the nation will not suffer from the failures to meet these human capital challenges; they will get the first choices in a tight teacher market. It is the children in the central cities, the small, poor rural communities, and in other places where there are large populations of the low-income families that will suffer.

[58] See, for example, Jill Tucker, "Bay Area Schools Scramble for Qualified Teachers amid Shortage, *SFGate,* October 12, 2014, http://www.sfgate.com/education/article/Bay-Area-schools-scramble-for-qualified-teachers-5818410.php

[59] See the *Vergara v. California* entry in Wikipedia for background information on the suit, the specific state statutes involved, and additional citations. http://en.wikipedia.org/wiki/Vergara_v._California

Adequate and Fair Funding

We have already suggested something concrete the state governments might do to ensure finance equality across the districts state—legislate and implement a weighted pupil formula or an equivalent approach.[60] This action can be taken in the current environment, as demonstrated by California. It will require new revenue and time, but as we suggested earlier, the change could be spread over time and partially supported by the federal government. States should also seek ways to stimulate within-district equalization. Each of these actions would very positively alter the current unequal resource allocation problems in many states.

A fair and equitable finance system also must face the challenges of providing extra support for the groups of high-risk students that do not fit into the categories of the protected because of race or poverty. Special treatment is necessary for four additional groups of at-risk students that together may constitute up to 4–6 % of all of the nation's children in school: foster children (400,000 in the U.S.), children with incarcerated parents (2.7 million), homeless children (500,000 in any given year), and children/youth who suffer from a serious mental disorder (estimated four million nationally, many of whom are not served by special education).[61]

Effective Data Infrastructure

We have already considered the importance of data to continuous improvement; we believe the state is in the best position to ensure that the data infrastructure is sufficiently robust and adaptable. Beyond this the state must be able to point to examples of effective use of data as integral to continuous improvement and as offering a methodology for use throughout all of their districts and schools. This is particularly

[60] We recognize the difficulty of creating weighted pupil formulas in states where high percentages of school funding comes from local sources.

[61] Embedded in the federal education code are programs directed at some of these students, but even where there is a targeted program, the federal contribution to the support of the students is de minimis. For the federal homeless program, for example, the average support to a school for a homeless child is roughly $40 per year. Many states have similarly small programs for different groups of students. Others are unserved. Their in-school and out-of-school lives are chaotic and depressing, and each of these groups has a very high dropout rate. When they enter their teenage years, far too many suffer from drug or alcohol addiction and many of the males are eventually incarcerated. Even considering the overlaps among categories, the sum of students in these groups in any given year is likely between 2 and 3 million, or roughly 4–6 % of the public school children in the nation. For details on specific groups of these children, see the following sites: http://www.endhomelessness.org/ and http://www.mercurynews.com/breaking-news/ci_24294107/fears-another-lost-generation-youth-homeless-numbers-rising (homeless youth); http://www.osborneny.org/images/uploads/printMedia/Initiative%20CIP%20Stats_Fact%20Sheet.pdf; http://www.acf.hhs.gov/programs/cb/faq/foster-care4; and http://www.childtrends.org/?indicators=foster-care (foster youth); and http://www2.nami.org/Template.cfm?Section=federal_and_state_policy_legislation&template=/ContentManagement/ContentDisplay.cfm&ContentID=43804 (youth with mental disabilities).

important in low-capacity regions and districts that cannot do all the needed data work on their own.

Establishing an Accountability System that Supports Improvement

We expect that in the next few years, the locus of education accountability will largely shift from the federal to the state governments. Although they have shared the responsibility in law, the federal government has dominated since NCLB was passed in 2002. Over the past 25 years, the concept of accountability has driven a lot of positive and negative activity in schools and districts. For much of this time, accountability has been a one-way street. Schools and teachers have been held accountable for performance goals set by the federal government and states have been required to meet these goals to avoid being penalized. Only in extreme situations did districts face consequences for failing to meet performance goals, and never for failing to provide sufficient resources or assistance to their low-performing schools. The idea of reciprocity was not part of the mix.

In reciprocal accountability, the entities that hold schools and teachers accountable and control the provision of resources should share in the responsibility for the quality of the practices and student outcomes. Few would argue this premise. Yet while we acknowledge and document that many schools that are predominantly poor and African-American or Hispanic do not receive even the same level of resources as schools of the well-to-do (much less the level of resources they need), we still hold them to the same standards as the largely well-to-do schools.

For a high-stakes assessment to be fair, all students should have equitable opportunities and resources (Messick 1989). Clear and understandable reviews of the resource quality of a school and district should be conducted regularly. States should review their internal frameworks for assessing quality to make reasoned judgments about the opportunities available in districts and schools. Performance and quality measures for schools and districts should be transparent and reported.

The discussions about accountability are almost all focused on the details: How many years of testing should there be? Should the goals be set for 3, 5, or 10 years? Should we require penalties? As the states take over the responsibility to design and manage their accountability system, state leaders should first step back and decide what they want to accomplish. If they want a valid and effective system, they first need to address the glaring issues of inequality. They might also establish goals as well as monitor and provide support to districts and schools that have trouble maintaining progress. Reasonable long-term state goals might be high-quality education for all and equal outcomes for all subgroups of students. An overall short-term goal would be steady progress on the quality and outcome indicators by schools, districts and the state.

District Responsibilities

Of all the levels of governance, local districts have the most direct influence on what happens in schools. They are responsible for recruiting, assigning and supporting teachers; setting instructional policy; ensuring appropriate and efficient management of schools; allocating resources; and establishing an infrastructure to support system learning and ensure equity. The approaches that districts take to accomplishing these tasks will vary depending on the students they serve and the conditions in which they operate. There are 13,500 public school districts and 95,000 schools in the United States. Almost two-thirds of districts have fewer than 1500 students.

Among this diverse population of local systems are varying capacities and challenges. Most small districts, for example, rely on regional or county offices of education to provide expertise about technology, teacher recruitment, special education, and other federal and state programs and policies. Traditionally the quality of reform implementation will depend on the capacity of the state and regional entities to reach out and provide support. Right now the support role of these organizations often conflicts with their regulatory responsibilities, which often take precedence. We suggest that the balance needs to shift more toward improvement and support at all levels, particularly the local level, where it is likely to make the most difference. If the responsibilities of the federal government and states shifted more toward improvement in the ways we have suggested, the local and regional organizations could focus more effectively on improvement as well. This would be beneficial both to smaller, lower-capacity districts and to larger systems with greater capacity that have often been thwarted in efforts to more effectively serve the students by fragmented, compliance-oriented state laws and agencies.

We see four main arenas in which district action can motivate and support both quality and equality. The first concerns districts' role in establishing a culture of continuous improvement focused on the success of all students. We have already described several systems that have demonstrated some success in this regard. These are systems that have established common goals and metrics to measure progress toward attaining those goals. Particularly important is that the metrics include information that allows system and school leaders to identify specific gaps and areas for improvement. Dashboards reflecting these multiple measures can allow district leaders to allocate attention and resources (including human, material, and intellectual resources) to address identified problems of practice. Providing support for cross-school and cross-functional collaboration and learning, in addition to establishing a culture of trust where failure is understood and used as an opportunity for growth, are also part and parcel of such a system.

A second arena in which districts can foster positive change is through the establishment of a systemic approach to equitable resource allocation based on student and school needs. There are various models for more effective within-district allocation, all of which rely on clear alignment between system goals and budgeting processes. Whatever budgeting system a district uses, monitoring the effectiveness of programs and strategies is crucial to ensure that resources flow to more effective strategies and less effective ones are pruned away or revised.

Of course, the district's most valuable resources are its people, particularly its teachers and administrators. Thus, establishing an effective human capital system that ensures quality and supports continuous learning is perhaps the district's most critical function. Although educator quality is a goal at all levels of the system, districts have particular roles to play at key junctures: recruitment, tenure decisions, and evaluation cycles. Because the pools from which districts and schools recruit staff are primarily local, some districts have even established relationships with local pre-service programs or established their own teacher residency and administrator training programs to ensure that those pools are filled with candidates likely to meet their needs. And once hiring decisions have been made, districts can do a great deal to provide structure, time, and support for coordinated learning within and across schools and to engage teachers and administrators as professionals in their own learning processes. In all these functions, as well as in negotiating contracts, building a strong and productive relationship with the unions is critical and generally beyond the capacity of individual schools.

A final role is to engage the broader public, manage the inevitable politics of American education at the local level, and connect schools and students with other child-related agencies and organizations that can help address students' broader needs. For many larger districts, these reforms would be carried out in intensely political environments. School boards are often steppingstones to higher elected office. Campaigns cost money that needs to be raised from donors. Local boards generally accept state law and regulation—but may greatly influence the implementation of the reforms. Unfortunately school boards in these cities routinely roll over their superintendents every three to five years and seem to be always on the outlook for "magic bullets" that will assuredly and easily raise student achievement. Stability, focus, adaptation, and a continuous strategy and commitment to meeting the needs of all students are a recipe that is only attractive when your constituency is seen to be benefiting.

Increasing Professional Accountability and Support

Governmental and administrative policy, no matter how well designed, is insufficient to achieve the goals we have described. We see the education profession itself as a needed second source of both pressure and support for improvement. Decades of policy implementation research have demonstrated that teaching is too complex to be effectively governed by bureaucratically defined rules and routines. Teachers not only require specialized knowledge, as do all professionals, but must be able to apply their knowledge and skills in specific contexts (students, content, school setting, etc.) to the benefit of their clients (students). In mature professions, the requisite knowledge is articulated in professionally determined standards of practice, and members of the profession assume responsibility for defining and enforcing those standards. This is professional accountability.

In earlier work, O'Day (2002, 2008) argued that professional accountability offered a promising complement to policy actions in support of improvement by focusing attention on the core process of instruction, the need for ongoing learning of the adults in the system, and the norms of professional interchange. By professional interchange, we mean placing the needs of the client at the center of professional work, collaborating with other professionals to address those needs, and committing to the improvement of practice as part and parcel of professional responsibility.

Professional accountability is thus closely tied with the more recent concept of professional capital put forward by Andy Hargreaves and Michael Fullan (2012). Defining professional capital as comprising human capital (knowledge and skills), social capital (relationships among professionals and between professionals and other stakeholders), and decisional capital (the ability to make discretionary decisions), these authors use the experience of Ontario and other school systems to argue that professional capital sits at the heart of effective efforts to improve outcomes for students.

Professional accountability/professional capital can motivate and support continuous improvement and equity in education in several ways (O'Day 2008). First, the focus on both instructionally relevant processes and student outcomes sets the stage for improvement cycles in which actions are systematically related to results in an ongoing progression of individual and organizational learning. Second, the emphasis on professional knowledge makes it more likely that educators will be able to posit reasonable hypotheses within those cycles and interpret and act on the information they receive. Third, inculcating norms of professional collaboration will increasingly put educators into situations in which they can benefit from the knowledge and skills of peer; when this collaboration reaches across contexts, it will provide opportunities for educators to challenge their own and each others' existing assumptions about the capabilities of students and effective practices. Fourth, professional accountability expands the incentives for improvement, with particular emphasis on the intrinsic motivators that bring teachers into teaching in the first place—a commitment to students and identity as an educator (O'Day 1996; Finnigan and Gross 2007; McLaughlin and Talbert 2001). Finally, to the extent that the profession's focus on the needs of clients encompasses a commitment to reducing opportunity and outcome disparities, professional accountability can help sustain an equity agenda over time.

We see the emergence of professional learning communities (PLCs) within and across school sites in recent years as a manifestation of the potential power of professional capital and professional accountability. Where they work well—as in Sanger Unified School District in California—PLCs operate as communities of practice (Wenger 2000) in which participants work together to address a shared problem of practice, developing common norms and tools to facilitate the process over time. They follow protocols similar to the Plan-Do-Study-Act cycles in which they identify a problem, plan how to address it, do what they set out to do, study the results—often through examination of assessment data or student work—and then

act upon this information to refine the next cycle of inquiry and improvement. In Sanger, this process is structured around four key questions:

1. What do we want our students to learn?
2. How will we know when they have learned it?
3. How will we respond when learning has not occurred?
4. How will we respond when learning has already occurred?

Participation in the PLCs is seen as part of what it means to be a teacher in the school or district, and the patterns of professional responsibility and inquiry among teachers are mirrored in communities of principals and of administrators within the central office. In Sanger, PLCs have been the cornerstone of the improvement process since 2004 and have moved this high-poverty, high-English-learner district from being one of the lowest performing in the state to one that has been nationally recognized as a model of exceptional turnaround (David and Talbert 2013). Similar, if somewhat less pronounced, examples of a PLC-based strategy have occurred in districts across the U.S.

Professional associations and networks are also avenues for the development and diffusion of professional norms and practices and can be vehicles for taking the principles of PLCs and continuous improvement to scale across districts and even across states. Organizations like the National Council of Teachers of Mathematics or the California Subject Matter Projects have been significant forces for changing teaching practices and norms and for maintaining relationships among discipline-based professionals over time. Recently, efforts to implement the Common Core State Standards have become a focal point for the work of many such networks and professional associations, with the commonality of the standards providing the basis for collaboration across contexts. Networks of schools or districts are playing a similar role at the organizational level, providing opportunities for mutual learning and improvement.

The ten CORE districts in California, for example, have developed common metrics and are engaged in mutual learning activities to implement the Common Core State Standards, increase achievement and attainment, and reduce disparities for the over one million students they collectively serve.[62] Their efforts have become models for others in the state and have helped to inspire similar partnerships among groups of smaller districts focused on shared problems, such as improving instruction and outcomes for California's substantial population of English language learners. It is important to note that while these are formal partnerships across school systems, it is the professional learning and relationships within them that drive the work. It is also important to note, in the context of this volume, that the focus in these efforts is on improving both quality and equality within the educational systems involved.

[62] The district partners in CORE include Los Angeles, Long Beach, Garden Grove, Santa Ana, Fresno, Sanger, Clovis, Sacramento City, San Francisco, and Oakland Unified School Districts.

Mobilizing an Engaged Citizenry

Professional accountability is not enough, however. There have been many examples in recent years of equity-focused reform efforts—even some with fair support among educators—that fell to partisan politics and pushback from a public that didn't understand or agree with the rationale for the changes. Often, public and political support for the status quo is based on deep-seated beliefs about meritocracy, the scarcity of educational goods, and the inability of some children to take advantage of opportunities when offered (Oakes and Lipton 2006). Behind these beliefs sits a power structure that preserves advantages for wealthier and more privileged communities at the expense not only of less privileged communities but also the nation as a whole (Stiglitz 2012). To create and sustain meaningful policies and practices to equalize opportunities for low-income students and students of color requires more than technical solutions and more than an engaged profession. It also requires public constituency and mobilization.

We see this mobilization as necessarily occurring on two levels. One is the coordination of efforts at the "grass tops"—that is through building coalitions among the leaders of the many education stakeholder groups—everyone from higher education institutions to employer groups, parent organizations, advocacy and civil rights groups, and health care and community-based organizations that work with children in other capacities. Political figures and public agency representatives may be a part of these coalitions, but they focus primarily on gathering support and involvement of organized constituencies outside the more formal education system and political structure.

In the past few years, the social sector has seen increased interest in and use of collective impact strategies that employ such coalition efforts to address particularly intractable and complex social problems. The concept of collective impact seems to have emerged from the Strive Together initiative in Cincinnati, which brought together local leaders to tackle the student achievement crisis in greater Cincinnati and northern Kentucky. Defining system change as community-wide transformation in which various partners (a) productively use data to improve their decision making and (b) constantly weigh the impact of their decisions on both their own institutions and the broader ecosystem that work to improve the lives of children, the leaders of Strive Together posited a four-pillar theory of action for collective impact: establishing a shared community vision, instituting evidence-based decision-making and shared accountability among the partners to improve selected outcomes, using continuous improvement approaches to identify and spread promising practices to improve community-level outcomes, and aligning financial and other resources to support and sustain improvement (Edmondson and Hecht 2014, 6–7).

Though Strive Together may have coined the phrase, others have instituted similar collective efforts, sometimes over decades (e.g., El Paso). All are based on the theme that cross-sector, cross-organization coordination is more likely to contribute to large-scale, sustained social change than are the isolated actions of individual organizations and agencies. Within this coordinated approach, the goal of eliminating

disparities is a core principle. While such partnerships are not without their challenges, they not only lead to greater short-term success but can also build an infrastructure for identifying shared interests and maintaining a focus on addressing inequities across changes in superintendents and political environments.

In addition to grass-tops approaches like collective impact strategies, grass roots organizations and social movements can create pressure for maintaining focus on equal opportunities within and beyond education. One goal of community-organizing efforts in education is to ensure the accountability of policy makers and local education leaders to students, parents, and the community for providing full opportunities to students in high-poverty communities and communities of color (Renee and McAlister 2011). The power of community organizing comes from the base of community members, rather than an elite set of leaders.

While much of community organizing is adversarial in nature, intended to keep up the pressure for addressing the needs of underserved students, organizing can also provide important support to local school districts. Working in conjunction with researchers and educators, local community members can help to identify problems requiring attention, gather data not available to most educators, and maintain consistency of focus across changes in leadership and conditions (Oakes and Lipton 2006). Such has been the case, for example, in efforts in Oakland and Los Angeles as these districts have confronted and eliminated discriminatory discipline and suspension policies that systematically denied children of color, particularly boys and young men, access to classroom instruction.[63] Community organizing has contributed to documented success in increasing and more equitably distributing educational resources, ensuring access to college preparatory curricula, and establishing more effective recruitment and retention strategies in hard-to-staff schools.

Conclusion

We began this chapter with a brief review of how curtailed opportunities outside school exacerbate, and are exacerbated by, those inside the educational system to virtually disenfranchise large numbers of low-income students and students of color and perpetuate conditions of poverty across generations. We have offered a set of lessons from decades of education reform efforts and have applied those to

[63] For example, the Urban Strategies Council in Oakland was instrumental in analyzing data that led to an agreement between the district and the OCR to address egregious disparities in suspension and expulsions of African-American and Latino boys. In Los Angeles, community demonstrations supported efforts of the district administration to push for school board policies that ended use of the ambiguous and racially discriminatory "willful defiance" justification for suspension and that decriminalized all but the most dangerous infractions of school policy. Over a five-year period from 2007–2008 to 2012–2013, the suspension rate declined from 8.1 to 1.5 %, moving from almost 75,000 days lost to a little over 12,000. (See *LA School Report*, October 14, 2013. Retrieved at http://laschoolreport.com/la-unified-suspension-rate-accelerating-down-to-1-5-percent/) Keeping students in classrooms is a critical aspect of ensuring equity and access.

sketching out how a more equitable system might operate. And we have suggested a three-pronged strategy of governmental action, professional networking and accountability, and public engagement and constituency building to provide the pressure and support for moving in this direction. But is such an approach possible at scale? Examples like Montgomery County, MD, and Long Beach, CA, provide some evidence of feasibility at the local level. But what about whole states—and, in particular, what about those that are currently failing so many of the nation's poor students and those of color?

Recent developments in California provide some basis for optimism and help demonstrate how the sources of pressure and support can possibly work together to turn a diverse and complex state in the direction of equity and long-term improvement.[64] Let's be clear: We neither offer California as an exemplar of a mature continuously improving system, nor as one that has demonstrated extraordinary achievement for its traditionally underserved students. Rather, we suggest that the state has taken an important step forward, building a foundation for equity and improvement that was almost unimaginable even five short years ago.

Let's begin with a little context. California educates over 6.2 million students, or about one in every eight public school children in the U.S. California's students are among the most diverse and disadvantaged in the nation, with approximately 59 % coming from low-income families, compared with 48 % nationally.[65] Seventy-five percent are students of color, including 53 % Hispanics, 9 % Asian-Americans, and 6 % African-Americans, among others. Over 1.4 million, or 23 %, of the state's students are officially classified as English language learners, compared to 9.1 % nationally (Snyder 2014). California's ELLs represent by far the largest number and percent of such students among all U.S. states—indeed, almost one-third of English learners in the U.S. attend school in the Golden State.

The state has not done well by this increasingly diverse population of students. In 2013, California students who were eligible for free and reduced-price lunches ranked from 49th (grade 4 math) to 42nd (grade 8 reading) among similarly low-income students in other states on NAEP. And achievement gaps (between Whites and African-Americans or Hispanic students and between those eligible and not eligible for the school lunch program) were similar to the corresponding gaps nationally, ranging from 25 to 33 points—or about 2.3 to three grade levels across both subjects and grades.

A major reason for this poor performance in the past few decades has been California's dysfunctional system of education—found "fundamentally flawed" by a massive independent investigation of the state's school finance and governance

[64] For a more detailed discussion of the current policy environment in California and the approach and actions that led to the changes, see O'Day 2015.

[65] These figures use eligibility for free and reduced price lunches as a proxy for low income. Data for California come from the California Department of Education Data Quest figures for 2013–14. The national figure is taken from the Southern Education Foundation (2013) and pertains to 2011 enrollment.

systems in 2007 (Loeb et al. 2008, 8). Among the themes of the 23 independent reports of this "Getting Down to Facts" (GDTF) investigation were the following:

- Overregulation and proliferation of categorical funding streams had led to fragmentation, contradictory policies, and an emphasis on compliance over effective teaching and learning;
- Funding for education was sorely inadequate (lagging well behind national averages and difficult to increase due to Proposition 13's constitutional cap on property taxes), unnecessarily complex, and "inequitable by any measures";
- The state lacked a coherent system for recruiting, developing, and retaining high-quality teachers; and
- Administrators had neither the data systems nor analytic capacity to enable system learning and improvement.

Mistrust and lack of leadership at the state level delayed action on the synthesis report's recommendations, and less than a year after it was released, California was plunged into a severe fiscal crisis. Already inadequate district budgets were slashed. Teachers and administrators were laid off, class sizes soared, and most legislators and education leaders were too busy treading water to see a way forward.

That was six years ago. Today the policy landscape and prospects for the future have taken a decided turn for the better. Passage of Proposition 30 in November 2012 brought $6 billion per year in new revenues into state coffers, directed primarily at K-12 and higher education (Fensterwald 2014). The Local Control Funding Formula (LCFF) passed in June 2013 has simplified the school finance system, ensured greater equity for targeted student populations across (and hopefully within) school districts, and provided flexibility so that local educators can develop coherent strategies for serving their students and communities. Moreover, stakeholder groups across the state—including the California Teachers Association, state legislators and administrators, higher education and business leaders, advocacy groups, and local educators—have united in support of the Common Core State Standards, and the state legislature allocated an additional $1.25 billion explicitly for implementation in 2013. Perhaps most surprising, the prevalent attitude appears to be on digging in for the long haul, and talk of "capacity building" and "continuous improvement" have become more common, even among politicians in Sacramento.

Many factors have combined to create this new window of opportunity in California education. We highlight a few of these, using the framework of the three sources of pressure and support outlined in the previous section.

Restraining the Role of Government: Focusing on the Long Term

California is an excellent example of how restraining and focusing the role of government can lay the groundwork for greater equity and improvement. With the election of Jerry Brown in 2010, the state's leadership team set out a methodical plan to

accomplish two goals: right the broken funding and governance system, and provide coherent support for deep transition to the Common Core at the school and classroom levels. A first step was restoring funding for education as the state began its economic recovery; without this move, the other steps would have been difficult, if not impossible, both politically and fiscally. But at the heart of the fiscal transformation has been passage and implementation of the LCFF, which has two major components: (a) a more equitable allocation formula to districts, based on the numbers of students, with additional weights for counts and concentrations of students in poverty, English learners, and foster youth; and (b) the removal of categorical funding streams, and with them, the myriad of conflicting, burdensome, and top-down regulations that made it difficult for local districts to develop coherent, context-specific improvement strategies.

The second focus has been to support effective implementation of the Common Core. The governor, State Board of Education, Department of Education, and state legislature have all united around this goal, and the legislature's allocation of an additional $1.25 billion for capacity building for Common Core standards implementation had both symbolic and material benefits toward its realization. In addition, policies for curriculum and instructional guidance (recommendations of texts and development of instructional frameworks), teacher licensure, admissions criteria for the state's public universities, and accountability systems have been or are being aligned to support Common Core implementation. Each of these areas reflects the same state restraint as in LCFF, with the state playing a supportive and advisory role and placing much greater discretion with districts to respond to their local contexts.

Perhaps one of the boldest and most illustrative moves of the state was the decision to end use of the existing California Standards Tests in spring 2014, before the new Common Core standards-aligned assessments were ready for full implementation. Believing that continued administration of the old tests would send mixed signals to teachers and schools—and recognizing that students and adults could benefit from a run-through with the new assessment formats and technology—state leaders pushed back against accountability demands from the federal government and instead expanded the Smarter Balanced Assessment Consortium (SBAC) field test to include all students in the relevant grades across the state. This move was accompanied by a systematic collection and analysis of data on the implementation of the field test to inform state and local leaders about their readiness for the official SBAC administration set for spring 2015.

State leaders have also maintained focus by eschewing "reforms" that they believed were not in the best interests of the state or would detract from the fiscal and Common Core foci. Most notably, they declined to apply for an NCLB waiver because it would have required creation of a state test-based teacher evaluation system, which they felt would both violate state law and jeopardize the emerging coalition in support of Common Core implementation.

Building Public and Stakeholder Constituency for Improvement

None of the changes above would have been possible without the ongoing mobilization both of the leaders ("grass tops") of education stakeholder groups in the state and grassroots organizing among parents and voters in the communities. Community organizers along with statewide advocacy groups and professional associations rallied support for passage of Proposition 30 in 2012, which brought new dollars into the system through institution of a tax on the wealthiest 3 % of Californians. These same organizations remained active in the massive effort to press the state legislature to pass LCFF and have been involved in providing input into its refinement over the past two years. Indeed, local community and parent input is a core requirement in the development of the Local Control Accountability Plan, in which each district outlines its locally determined goals and allocations for addressing the general state priorities in education.

The momentum and sense of accomplishment from the successful LCFF campaign has also carried over to a sense of optimism and common purpose around Common Core implementation. Informal stakeholder meetings in 2013 led to the formation of a statewide Consortium for Implementation of the Common Core, with involvement from state agencies, local districts, county offices of education, charter management organizations, business, higher education, advocacy groups, teachers unions, and professional associations. The purpose of this consortium is to enable coordination of effort, fill in gaps where needed and feasible, and maintain an active broad-based constituency of support for continuous improvement and standards implementation.

Leveraging and Strengthening Professional Networks

Of course, the heart of educational improvement relies on building professional engagement, commitment, and capacity—including the needed social capital to spread more effective practices. In California this has taken the form of involving professional associations and the teachers unions in Common Core coalitions, as well as mobilizing professional networks like the California Subject Matter Projects to focus teacher attention and learning on the knowledge and practices needed for effective Common Core-aligned instruction. Leading districts in the state have provided exemplars of continuous improvement strategies, and networks and partnerships of local districts have generated opportunities for focused learning across contexts and across levels of the systems involved.

A combination of pressure and support from each of these arenas has been instrumental in laying the foundation for a more equitable state education system and one that enables rather than precludes a continuous, standards-based approach to improvement. Yet California's progress in this direction is still precarious, and several key challenges face state policy makers and local educators over the next few years.

First, it is unclear what will happen when the expectedly low results of the new SBAC assessments are released in summer 2015: Will the public and its politicians have the patience for the long-term improvement process needed? Second, it is also unclear whether the local planning processes put in place for LCFF will generate the kinds of strategic coherence and consistency needed to ensure deep and equitable implementation of the new standards. Trust between equity advocates and local educators is still inchoate, and LCFF remains an experiment in the eyes of many. If results for traditionally underserved students are insufficiently transparent or compelling, the pullback to categorical funding streams and requirements will be strong—and demoralizing. A third challenge is the as-yet-undefined nature of the new accountability system and the lack of a unified vision for accountability that can actually support continuous improvement. Finally, the greatest challenge is the most obvious: How will the state build the individual and organizational capacity at the local level to enable the instructional shifts in classrooms across the state? California has almost 300,000 teachers, and they carry the burden for success of the Common Core and of the education enterprise more generally. Establishing the infrastructure to support them in this transition is an unprecedented challenge that the state has yet to fully address.

We have ended with an extended description of the situation in California because we believe that it provides reasons for hope as well as lessons for other states and jurisdictions. If we can move education in the most complex and challenging state system in the country, then other less troubled and more successful systems should also be able to make progress. California's example suggests the importance of both leadership and stakeholder engagement, of flexibility combined with coherence and focus, and of adequacy and equity of resources.

It also suggests the magnitude of the challenge to take such a vision to all of the other 49 states. Yet, there is hope and some evidence that change is possible. There are scattered examples of states such as Massachusetts and Texas that have proposed reforms and stayed with them over at least a decade. A substantial number of districts across the country have moved toward continuous improvement models as the core of their reforms, based on a growing recognition that accountability without investment in improvement does not work. Networks of superintendents and teachers exist in many states. Almost everyone in education understands we need standards and curricula that prepare students for intellectually rigorous work and that teachers need substantial support to implement the new curricula. Many of the ingredients for serious reform exist—this story is not over.

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Chapter 10
Restoring Opportunity by Expanding Apprenticeship

Robert I. Lerman

Abstract Restoring opportunity requires jobs that can generate middle class incomes. Notwithstanding concerns about the declining share of middle-wage jobs, this chapter argues that building a robust apprenticeship system in the U.S. can sharply increase earnings and the share of American workers entering rewarding careers. By emphasizing "learning by doing" as a paid employee, apprenticeships are especially effective in preparing workers to gain a valued occupational qualification. They enhance youth development by providing a more engaging experience than schooling does and by linking young people to mentors. They encourage employers to upgrade jobs and develop job ladders. Apprenticeships currently represent a much smaller share of the workforce in the U.S. than in most other advanced countries. This chapter contends that expanding apprenticeship is feasible and a highly cost-effective strategy for restoring opportunity.

Keywords Apprenticeship • Labor market • High-skill jobs • Middle-skill jobs • Low-skill jobs • Job training • Unemployment • Wages • Occupations • Community colleges • Career academies • Career and technical education (CTE) • Licensing • Certification

Introduction

Central to concerns about opportunity in America is the erosion of middle class jobs. Economist David Autor (2010) highlights the polarization in the U.S. labor market, with computerization eliminating middle-skill jobs while shifting low-skill workers into poorly paid and difficult-to-automate service professions.

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A *Financial Times* report[1] on the United Kingdom found that, "Jobs are being created at the top and bottom of the skills scale, while those in the middle tier—including office administrators and blue-collar process operators—are losing out. The trend is intensifying the 'hour glass economy,' where new technologies increase low-skilled jobs but eliminate many in the middle that require intermediate skills." High youth unemployment rates in the U.S. and especially in Europe exacerbate these trends by keeping many workers from gaining initial work experience. According to *The Economist*, rapid technological change is lowering the costs of replacing workers with robots and wages are stagnating even as economic growth has resumed.[2]

Opportunity is becoming increasingly difficult to sustain in the context of widening educational divides that increase the supply of workers without a college education who need jobs. Although rates of high school graduation have increased in general, including for less advantaged groups, the majority of all workers and the vast majority of young minority male workers leave school without any qualification beyond high school. Low proficiency in literacy and numeracy is the norm for high school graduates (with no college), according to data from the Organisation for Economic Co-operation and Development's (OECD) Programme for the Assessment of Adult Competencies (PIAAC) (Holzer and Lerman 2015). The vast majority of high school graduates attend college, but as of 2014, only about 46 % of 25- to 34-year-old Americans had achieved an associate's (A.A.) or bachelor's (B.A.) degree. Young men, especially minority men, are particularly at risk, with only a modest share graduating either a two- or four-year college. Among 25- to 34-year-olds, 29 % of African-American and 19 % of Hispanic men had attained an A.A. or B.A. degree as of March 2014.[3]

The lack of work experience among youth is another major concern. Only one in three Black 18- to 22-year-old men held a job in March 2014; more than half had no work experience at all in 2013. Because work experience contributes substantially to career success, the high rates of joblessness of young people can weaken their long-term opportunities.

Are these trends inevitable and impervious to policy? Or can wise skill development approaches help engage young people and expand their job opportunities, partly by preserving middle class jobs? This chapter considers the potential of robust apprenticeship systems for increasing opportunity by raising skills, productivity, and wages, thereby increasing the chances for young people to find and hold jobs providing middle class incomes.

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[1] Weitzman, Hal, and Robin Harding. "Skills Gap Hobbles US Employers," *Financial Times,* December 13, 2011.

[2] "The Economics of Low Wages: When What Goes Down Doesn't Go Up." *Economist*, May 2, 2015.

[3] These figures come from the author's tabulations of the March 2014 Current Population Survey (CPS). The estimates may overstate the share of Black men with high levels of education as the data exclude men in jail or prison. In addition, the CPS is likely to undercount Black men just as the decennial census does, and these men probably have lower levels of education than men counted in the CPS.

The chapter begins by defining apprenticeship and describing why apprenticeship should be a central component of the nation's approach to preparing people for careers. Next, we consider whether apprenticeships, or any training, can restore opportunity in the context of a hollowing out of the middle of the distribution of jobs. Specifically, we describe skill requirements and alternative approaches to preparing and upgrading the skills of individuals for these occupations. Programs of academic education and apprenticeship programs emphasizing work-based learning have often competed for the same space, but the full picture reveals they can complement each other significantly. Then, we show how apprenticeship can affect the demand side of the market, encouraging firms to transform jobs into high-skill career positions. We consider the evidence on the costs and effectiveness of apprenticeship training in several countries. Of particular interest is the evidence on the impacts of apprenticeship on firms and new findings on whether apprenticeship training locks workers into specific occupations and limits their occupational mobility. The analysis examines the costs and benefits of apprenticeship versus school-based alternatives aimed at preparing young people for careers. We go on to discuss recent policy developments in the United States and the implications for the feasibility of expanding apprenticeship. The concluding section answers the question on the role of apprenticeship systems in rebuilding middle class jobs.

Defining Apprenticeship and Explaining Its Advantages

Apprenticeship training is a highly developed system for raising the skills and productivity of workers in a wide range of occupations, with demonstrated success abroad and scattered examples of success domestically. Apprentices are employees who have formal agreements with employers to carry out a recognized program of work-based and classroom learning as well as a wage schedule that includes increases over the apprenticeship period. Apprenticeship prepares workers to master occupational skills and achieve career success. Under apprenticeship programs, individuals undertake productive work for their employer; earn a salary; receive training primarily through supervised, work-based learning; and take academic instruction that is related to the apprenticeship occupation. The programs generally last from 2 to 4 years. Apprenticeship helps workers to master not only relevant occupational skills but also other work-related skills, including communication, problem solving, allocating resources, and dealing with supervisors and a diverse set of co-workers. The course work is generally equivalent to at least 1 year of community college.

In Austria, Germany, and Switzerland, extensive apprenticeships offer a way of upgrading the quality of jobs, especially in manufacturing, commercial, and managerial positions.[4] In these countries, apprenticeships begin mostly in the late high

[4] For a list of occupations using apprenticeships in several countries, see the occupational standards section of the American Institute for Innovative Apprenticeship website at www.innovativeapprenticeship.org

school years, absorbing 50–70 % of young people on their way to valued occupational qualifications (Hoffman 2011). OECD reports (2009, 2010) highlight the role of a robust apprenticeship system in limiting youth unemployment.

Apprenticeships within the U.S. and elsewhere show how construction occupations can reach high wages and high productivity. The question is whether the model can be extended and attract firms to upgrade other occupations. Apprenticeship expansion holds the possibility of substantially improving skills and careers of a broad segment of the U.S. workforce. Completing apprenticeship training yields a recognized and valued credential attesting to mastery of skill required in the relevant occupation.

Apprenticeships are a useful tool for enhancing youth development. Unlike the normal part-time jobs of high school and college students, apprenticeships integrate what young people learn on the job and in the classroom. Young people work with natural adult mentors who offer guidance but allow youth to make their own mistakes (Halpern 2009). Youth see themselves judged by the established standards of a discipline, including deadlines and the genuine constraints and unexpected difficulties that arise in the profession. Mentors and other supervisors not only teach young people occupational and employability skills but also offer encouragement and guidance, provide immediate feedback on performance, and impose discipline. In most apprenticeships, poor grades in related academic courses can force the apprentice to withdraw from the program. Unlike community colleges or high schools, where one counselor must guide hundreds of students, each mentor deals with only a few apprentices.

Apprenticeships are distinctive in enhancing both the worker supply side and the employer demand side of the labor market. On the supply side, the financial gains to apprenticeships are strikingly high. U.S. studies indicate that apprentices do not have to sacrifice earnings during their education and training and that their long-term earnings benefits exceed the gains they would have accumulated after graduating from community college (Hollenbeck 2008). The latest reports from the state of Washington show that the gains in earnings from various education and training programs far surpassed the gains to all other alternatives (Washington State Workforce Training and Education Coordinating Board 2014). A broad study of apprenticeship in 10 U.S. states also documents large and statistically significant earnings gains from participating in apprenticeship (Reed et al. 2012).

These results are consistent with many studies of apprenticeship training in Europe, showing high rates of return to workers. One recent study managed to overcome the obstacle that such studies tend to face where unmeasured attributes explain both who is selected for an apprenticeship and how well apprentices do in the labor market (Fersterer et al. 2008); the authors did so by examining how an event unrelated to the apprenticeship (the firm staying in or going out of business) caused some apprentices to have full apprenticeships while others found their apprenticeships cut short. The estimates indicated that apprenticeship training raises wages by about 4 % per year of apprenticeship training. For a three- to four-year apprenticeship,

post-apprenticeship wages ended up 12–16 % higher than they otherwise would be. Because the worker's costs of participating in an apprenticeship are often minimal, the Austrian study indicated high overall benefits relative to modest costs.

On the demand side, employers can feel comfortable upgrading their jobs, knowing that their apprenticeship programs will ensure an adequate supply of well-trained workers. Firms reap several advantages from their apprenticeship investments. They save significant sums in recruitment and training costs, reduced errors in placing employees, avoiding excessive costs when the demand for skilled workers cannot be quickly filled, and knowing that all employees are well versed with company procedures. Because employers achieve positive returns to their investments in apprenticeship, the worker and the government can save significantly relative to conventional education and training. After reviewing several empirical studies, Muehlmann and Wolter (2014) conclude that "…in a well-functioning apprenticeship training system, a large share of training firms can recoup their training investments by the end of the training period. As training firms often succeed in retaining the most suitable apprentices, offering apprenticeships is an attractive strategy to recruit their future skilled work force…"

One benefit to firms rarely captured in studies is the positive impact of apprenticeships on innovation. Well-trained workers are more likely to understand the complexities of a firm's production processes and therefore identify and implement technological improvements, especially incremental innovations to improve existing products and processes. A study of German establishments documented this connection and found a clear relationship between the extent of in-company training and subsequent innovation (Bauernschuster et al. 2009). Noneconomic outcomes are difficult to quantify, but evidence from Europe suggests that vocational education and training in general is linked to higher confidence and self-esteem, improved health, higher citizen participation, and higher job satisfaction (Cedefop 2011). These relationships hold even after controlling for income.

In the United States, evidence from surveys of more than 900 employers indicates that the overwhelming majority believe their programs are valuable and involve net gains (Lerman et al. 2009). Nearly all sponsors reported that the apprenticeship program helps them meet their skill demands—87 % reported they would strongly recommend registered apprenticeships; an additional 11 % recommended apprenticeships with some reservations. Other benefits of apprenticeships include reliably documenting appropriate skills, raising worker productivity, increasing worker morale, and reducing safety problems.

While apprenticeships offer a productivity-enhancing approach to reducing inequality and expanding opportunity, the numbers in the U.S. have declined in recent years to about one-tenth the levels in Australia, Canada, and Great Britain. Some believe the problems are inadequate information about and familiarity with apprenticeship, an inadequate infrastructure, and expectations that sufficient skills will emerge from community college programs. Others see the main problem as an unwillingness of U.S. companies to invest no matter how favorable government subsidy and marketing policies are. In considering these explanations, we should remember that even in countries with robust apprenticeship systems, only a minority

of firms actually hires apprentices. Because applicants already far exceed the number of apprenticeship slots, the main problem today is to increase the number of apprenticeship openings that employers offer. Counseling young people about potential apprenticeships is a sensible complementary strategy to working with the companies, but encouraging interest in apprenticeship could be counterproductive without a major increase in apprenticeship slots.

The high levels of apprenticeship activity in Australia, Great Britain, and Canada demonstrate that even companies in labor markets with few restrictions on hiring, firing, and wages are willing to invest in apprenticeship training. While no rigorous evidence is available about the apprenticeship's costs and benefits to U.S. employers, research in other countries indicates that employers gain financially from their apprenticeship investments (Lerman 2014).

Although apprenticeship training can prepare workers for a wide range of occupations, including medicine and engineering, apprenticeships are perhaps most appropriate for skilled positions that do not require a B.A. degree. A key question is whether these are the very jobs the country is losing and, if so, whether sufficient jobs amenable to apprenticeship will remain.

Patterns and Trends of Middle-Level Occupations

What are the mid-level or skilled sub-B.A. occupations that are most amenable to apprenticeship and significantly affected by the "hollowing out" of the middle class? Classifying mid-level occupations by a single distribution (say, by educational attainment or a score on a cognitive test) fails to capture the wide variety of skills required to master and be productive at specific jobs or occupations. One approach is to use wage as a proxy for skill in the particular job or occupation. Wages may be viewed as incorporating the skill levels along various dimensions together with the market valuation of those skills. However, wages reflect not only skill but also the riskiness, job satisfaction, responsibility, status, and flexibility of jobs and occupations. A second issue is that skill requirements and expertise required in an occupation might not change, but the wage return to the occupation might. Third, wages sometimes are a reward for tenure on the job; seniority often matters. Fourth, wage differences can come about from differences in bargaining power of workers in various fields. For example, the pay of longshoremen can depend on the ability of their representatives to gain strong returns because of the high costs of strikes relative to wage increases. Fifth, wages for the same occupation often differ widely across geographic areas, partly because of area differentials in the price of housing. Sixth, classifying occupations by mean wages can miss the wage variability within occupations.

A major proponent of the hollowing-out thesis ranks detailed occupations by their average wages in a base period (Autor 2010). Middle-skill jobs are in occupations in the middle segment of the average wage distribution in that period. Using his approach, Autor finds that middle-skill occupations are declining rapidly relative

to high- and low-skill positions. One of the main reasons is the increased power of computers to automate routine tasks that many middle-skill positions have long undertaken. Similar trends are apparently occurring in other countries. A paper by Goos et al. (2009) finds that middle-wage occupations declined as a share of employment in 16 countries.

The Autor approach provides a useful perspective but is subject to several limitations. One is the failure to capture the often wide distribution of wages within detailed occupations. Many sub-B.A. occupations can generate high wages at the top levels of quality and productivity. For example, the differences in wage levels, skill, and status are substantial between the occupations "cook at a restaurant" and "chefs and head cooks." Cooks are low paid, but chefs command a median wage that is about 25 % higher than the overall national median. Despite their limited formal education (only 13 % have a B.A. or higher), the top 25 % of chefs earn as much as or more than the median wage of four out of 10 college occupations (50 % or more with B.A. degrees). Were cooks and lower-level chefs upgraded to a status of high quality and productivity, earnings for a noncollege occupation could compete with earnings of many college occupations.

Occupations with above-average earnings and with a majority of workers without a B.A. cover a wide range of fields. Among them are construction managers, buyers and purchasing agents, lodging managers, appraisers, court reporters, various types of technicians, aircraft mechanics, police officers, police supervisors, and operators of gas plants.

In another approach to examining occupational trends, Holzer and Lerman (2009) use U.S. Bureau of Labor Statistics (BLS) estimates of education and training requirements to classify broad occupational categories. High-skill occupations are those in the professional/technical and managerial categories, while low-skill occupations are those in the service and agricultural categories. Middle-skill occupations are all the others, including clerical, sales, construction, installation/repair, production, and transportation/material moving. With this classification, middle-skill jobs show a decline but still make up roughly half of all employment today. In a 2013 article, Autor and Dorn predict middle-skill jobs will survive when they embody such human skills as interpersonal interaction, adaptability, and problem solving. Among other jobs, they cite medical paraprofessionals; plumbers; builders; electricians; heating, ventilation, and air-conditioning installers; automotive technicians; customer-service representatives; and even clerical workers who are required to do more than type and file.

A key question raised by Autor and others is how to characterize jobs that require "… situational adaptability, visual and language recognition, and in-person interaction." On one hand, preparing meals and driving a truck through city traffic are difficult to automate. Because these jobs need only modest training and attributes common across the population (dexterity, good eyesight, and language recognition), Autor sees them as commanding only low wages. But even these jobs could in principle involve pathways to reach "artisan" status.

Several occupations requiring a middle level of skills and good wages have increased a good deal since 1986, including medical therapists (such as respiratory,

recreational, and radiation therapists) by 30 %, carpenters (20 %), heavy vehicle maintenance specialists (25 %), and heating and air conditioning positions (21 %).

Taking Education, Training, and Labor Market Interactions into Account

The idea that education and training institutions should prepare people for current and future jobs raises several questions: Do jobs simply materialize from a single technology or family of technologies that effective employers eventually implement? Or, do employers confront a range of technologies, all of which can allow the company or public employer to remain competitive? Moreover, how does the choice of technology interact with the system of preparing or retraining workers?

An older literature (Piore and Doeringer 1971), now rarely cited, looked closely at segmented labor markets, where some employers choose to train, hire from within, and keep workers for long periods, while others operate mostly on the spot market, hiring and firing frequently and providing little training. Subsequently, many authors have highlighted that businesses have the choice to become "high road" vs. "low road" employers. For example, Osterman and Shulman (2011) insist that "firms have choices about how to organize work." They find examples of firms producing the same good or service using technologies that generate more or fewer skilled jobs paying good wages. In a landmark article providing a theoretical rationale for employer occupational training, Acemoglu and Pischke (1999) demonstrated how firms might optimize their hiring and training strategies in several ways, depending on the structure of the labor market and the potential permanence of the jobs.

Actual jobs and compensation vary widely within occupations, suggesting that the nature of work may depend on institutional settings that can lead different firms to choose different technologies to produce the same good or service. Given that production may be undertaken using a variety of skill distributions, the key policy questions become: 1) what are the skills within occupations that raise long-term wages and productivity, and, 2) what are the best approaches to educating and training workers to reach high levels of productivity and wages?

Skill Requirements for Workers to Reach Middle Class

The skills required for middle-level occupations are far from obvious. One issue is the appropriate level of generic academic skills. Another is the appropriate level of specificity in occupational skills. A third is the role of generic, nonacademic skills, such as communication, motivation, and responsibility. Some of all three types of skills are required for nearly all jobs, but the levels vary across occupations.

In the case of general academic requirements, U.S. education reformers have boldly claimed that "… *all* students — those attending a four-year college, those planning to earn a two-year degree or get some postsecondary training, and those seeking to enter the job market right away—need to have comparable preparation in high school" (Achieve 2005). Despite strong evidence against this proposition (Lerman 2008), this idea is taken seriously and has led to the creation of the Common Core standards at the high school level. The curriculum is in the process of implementation and is likely to crowd out occupation-based programs.

The evidence strongly suggests that occupational and nonacademic skills are far more significant from the employer perspective than are exposure to high-level academic courses. For example, data from a survey asking a representative sample of U.S. workers what skills they use on the job (Handel 2007) indicate that only 19 % use the skills developed in Algebra I, only 9 % use the skills for Algebra II, and less than 15 % of workers ever write anything five pages or more. On the other hand, upper blue-collar and even lower blue-collar workers need to know how to read and create visuals, such as maps, diagrams, floor plans, graphs, or blueprints—skills typically learned in occupation-specific courses. Moreover, certain nonacademic skills are clearly critical. Workers report the importance of problem-solving and communication skills, teaching and training other workers, dealing with people in tense situations, supervising other workers, and working well with customers.

One useful categorization of these skills comes from the 1992 Secretary's Commission on Achieving Necessary Skills (SCANS) report in the U.S. After researching the literature, consulting with experts, and conducting detailed interviews with workers and/or supervisors in 50 occupations, SCANS identified five groups of workplace competencies: the ability to allocate resources (time, money, facilities); interpersonal skills (such as teamwork, teaching others, leadership); the ability to acquire and use information; understanding systems; and working well with technology. The key personal qualities highlighted by SCANS and many surveys of employers include responsibility, self-esteem, sociability, self-management, and integrity and honesty. Hanover Research (2011) provides an updated analysis of lists of various twenty-first century generic skills.

In a survey of 3,200 employers that focused on four large metropolitan areas in the U.S., the responses indicated that such personal qualities as responsibility, integrity, and self-management are as important as basic skills or more so (Holzer 1997). In another large survey undertaken in the mid-1990s of 3,300 businesses (the National Employer Survey), employers ranked attitude, communication skills, previous work experience, employer recommendations, and industry-based credentials above years of schooling, grades, and test scores (Zemsky 1997). In a 2007 survey of employers in Washington state, about 60 % of employers reported difficulty in hiring (Washington State Workforce Training and Education Coordinating Board 2008). They experienced less difficulty finding workers with adequate reading, writing, and math skills than with appropriate occupational, problem solving, teamwork, communication, and adaptability skills as well as positive work habits and a willingness to accept supervision. Punctuality, reliability, and avoidance of drug and alcohol abuse are also critical. In a 2002 survey of 27,000 employers in the United

Kingdom, 23 % of employers reported a significant number of their staff were less than fully proficient in their jobs. Skill shortfalls were most common in communication, teamwork, other technical and practical skills, customer handling, and problem solving and least common in numeracy and literacy (Hillage et al. 2002).

Evidence confirming the importance of noncognitive/nonacademic skills has been accumulating in academic literature as well. Heckman et al. (2006) find that except in the case of college graduates, noncognitive skills (as measured by indices of locus of control and self-esteem) exert at least as high an impact—and probably a higher one—on job market outcomes than do cognitive skills (word knowledge, paragraph comprehension, arithmetic reasoning, mathematical knowledge, and coding speed as measured by the Armed Forces Vocational Aptitude Battery).

In a recent study, Lindqvist and Vestman (2011) document the differential impacts of cognitive and what they term as noncognitive skills on the earnings of Swedish men. They used special data on a representative sample of the Swedish male population matched with education, earnings, and information on cognitive and noncognitive skills obtained in the military enlistment process through interviews with psychologists. Persistence, social skills, and emotional stability were the key noncognitive skills measured and scored from the interview. Lindqvist and Vestman found that cognitive and noncognitive skills are both positively related to employment and earnings. In the low to mid ranges of skills, noncognitive skills exert a higher impact on wages than do cognitive skills.

The sociocultural approach provides some revealing examples of how skills are used in context and how nonacademic skills are often developed and used as part of a "community of practice" (Stasz 2001). Nelsen (1997) points out that workplaces not only require formal knowledge—facts, principles, theories, math, and writing skills—but also informal knowledge—embodied in heuristics, work styles, and contextualized understanding of tools and techniques (Nelsen 1997). In her revealing case study of auto repair workers, Nelsen argues that social skills of new workers are very important for learning the informal knowledge of experienced workers, such as captured in stories, advice, and guided practice. Unfortunately, according to Nelsen, the social skills learned at school are not necessarily the same as the ones most useful at work.

What about occupational skills? Often, firms, labor representatives, and government reach agreement on what is required for a qualification that will allow employers to have confidence in the capabilities of their young workers. In several countries, skill requirements for occupations develop through the operation of apprenticeship programs and other training programs. Sometimes, the occupational qualifications fit within a broad framework of national vocational qualifications running from basic to intermediate to advanced levels (for a review of national qualification frameworks in Europe, see Cedefop 2012).

Taking a Look at Other Nations

In the United Kingdom, the National Vocational Qualification (NVQ) system specifies requirements for proficiency that vary widely across types of occupations and over levels within occupations.[5] It is a modular system that recognizes workplace learning and competence based on evidence of performance at the workplace. The NVQ system takes skill gradations in each defined field into account and allows workers to gain documentation for each level, whether attained with one employer or many. The ultimate goal is that employers place a value on attaining a qualification level, giving workers an incentive to learn on the job. Although this system has not worked as effectively as planned (Eraut 2001), the NVQ approach offers one example of how certifying the attainment of skills can provide the basis for measuring the heterogeneity of skills.

One effort to develop occupational or industry standards in the U.S.—the National Skill Standards Board (NSSB)—failed to develop relevant, rigorous, portable, and well-recognized skill standards to guide training and provide reliable signals to worker and employers. However, occupation-specific skills standards exist in the U.S. through state-level licensing and certification. These forms of occupation qualifications are expanding. Today, about one in five workers requires a state license to practice his or her occupation, up from less than 5 % in the early 1950s (Kleiner 2006). Much of this increase has resulted from rapid growth in traditionally licensed occupations such as physicians, dentists, and attorneys. But the number of licensing laws has been increasing as well. In the U.S., licensing rules vary widely across states, with many states regulating occupations as varied as alarm contractor, auctioneer, manicurist, and massage therapists. Although licenses ostensibly offer some quality assurance to consumers among all providers, Kleiner finds evidence of licensure playing more of a role in raising prices than assuring quality.

School-based and dual work-based/school-based systems try to ensure that occupational qualifications are widely accepted by employers. In primarily school-based programs, decisions about what is necessary to prepare young people for particular careers are often made by the faculty of postsecondary institutions. Often, training colleges—such as U.S. community colleges and for-profit schools—decide themselves (sometimes in consultation with potential employers) what constitutes qualifications in quite detailed occupations, such as domestic air conditioner and furnace installer, medical receptionist, and medical coder.[6] Other standards directly involve employers and government entities.

Occupational standards are prerequisites for the functioning of apprenticeship programs, which involve work- and school-based learning leading to a credential

[5] For an overview on NVQ and other qualification systems in the United Kingdom, see material provided by the Qualifications and Learning Authority at http://www.qca.org.uk

[6] Curricula for certificates in these occupations appear in the catalog for the Kentucky technical college system. See http://kctcs.edu/en/students/programs_and_catalog.aspx

documenting the individual's occupational qualifications. This issue has been tackled abroad in a variety of ways. Australia has developed the national Training Package (collections of competency standards gathered into qualifications) for all industry areas, while previously qualifications were only available in a limited range of occupations and industries (Smith 2012). The development of Training Packages is one activity of the nation's ten national Industry Skills Councils. In Canada, the Interprovincial Standards Red Seal Program helps develop occupational standards that allow for effective harmonization of apprenticeship training and assessment in each province and territory (Miller 2012). The Red Seal program's standards incorporate essential skills (reading, document use, writing, numeracy, oral communication, thinking, digital technology, and lifelong learning), common occupational skills (that apply to a small range of occupations), and specific occupational skills.[7]

In England, the Sector Skills Councils and their employers design the content of each apprenticeship using the design principles of a national Apprenticeship Blueprint (Miller 2012). The secretary of state appoints and Sector Skills Councils commission an Issuing Authority to promulgate standards for specific apprenticeships. As of 2012, there were 200 operating apprenticeship frameworks and an additional 118 under development. At the same time, employers have considerable flexibility in implementing their apprenticeship programs. France uses Apprenticeship Training Centers to help design and deliver the classroom-based components of apprenticeship, with skill standards often developed by Professional Consultative Committees (Dif 2012). They operate under frameworks established by the National Commission for Vocational Qualifications.

In Switzerland, the Federal Office for Professional Education and Technology, together with cantons, employers, trade associations, and unions, participate in framing the occupational standards for about 250 occupations (Hoeckel et al. 2009). The canton vocational education programs implement and supervise the vocational schools, career guidance, and inspection of participating companies and industry training centers. Professional organizations develop qualifications and exams and help develop apprenticeship places. Occupational standards in Germany are determined primarily by the "social partners," including government, employer, and employee representatives (Hoeckel and Schwartz 2009). The chambers of commerce advise participating companies, register apprenticeship contracts, examine the suitability of training firms and trainers, and set up and grade final exams.

The content of skill requirements in apprenticeships includes academic courses and structured work-based training. In each field, the requirements are to complete the coursework in a satisfactory manner and demonstrate the apprentice's ability to master a range of tasks. In some systems, there are a set of general tasks that apply to a family of occupations (say, metalworking) and tasks that apply to a specific occupation (say, tool mechanics or metal construction and shipbuilding). While the tasks vary widely across occupations, all involve the application of concepts and academic competencies.

[7] See the documents linked at http://www.red-seal.ca/tr.1d.2@-eng.jsp?tid=51 for examples.

The coverage of occupational standards for apprenticeship extends well beyond the traditional construction crafts. In the U.K., for example, specific apprenticeships are available within such broad categories as business, administration and law; arts, media, and publishing; health and public services; retail and commercial enterprise; and information technology and communication. Common apprenticeships in Switzerland include information technology specialists, commercial employees, pharmacy assistants, and doctor's assistants. German standards cover over 300 occupations, including lawyer's assistants, bank staff workers, industrial mechanics, industrial managers, retail workers, commercial sales, and computer networking. While much of the training is specific to the occupation, nearly all fields learn skills in closely related occupations. For example, apprentices in industrial management learn accounting, procurement, production planning, staffing, and logistics.

The ability to raise the quality of jobs and workers across occupations appears to help achieve relatively low levels of wage inequality. The enhanced occupational skills and productivity result in increased wages for workers who in other societies have low or average wages. As of the mid-1990s, the evidence showed wage inequality was especially low in countries that used apprenticeships extensively, including Austria, Germany, and Switzerland (Martins and Pereira 2004).

The Timing and Flexibility of Apprenticeship Training

Countries have developed a variety of approaches for training workers to become effective in intermediate level occupations—those that require considerable skill but not a B.A. degree. Systems vary with respect to the level and duration of general education, the timing of occupation-specific education and training, and the split between classroom- and work-based learning. Waiting too long to incorporate occupation-focused education and training runs the risk of high levels of disengaged students and forcing a highly academic approach on many students who would do better in a more concrete setting that emphasizes applications. This argument is especially strong to the extent that school requirements are poorly matched to the job market opportunities facing most young people.

On the other hand, beginning an occupation-focused program too early might trap youth in unrewarding fields and limit their adaptability and upward mobility. Work-based learning is appealing, but critics worry that the training will be too specific and firms will fail to offer sufficient positions. Still, several countries train skilled craftsmen through apprenticeships. However, for many other occupations, some systems rely entirely on school-based systems and some on work-based apprenticeship models that incorporate some classroom instruction.

Although discussions of skill preparation systems generally focus on the work- vs. school-based distinction, the quality, depth, and portability of what students or apprentices learn are at least as important. The skills learned in school-based programs are not necessarily of greater general applicability than those learned in apprenticeship programs. It depends on the specifics of what is being taught and the

likelihood that the worker will stay with the training occupation or an adjacent occupation. Depending on the program's content, workers may or may not be able to sustain the gains from training when moving to another firm with the same occupation or in other occupations.

The portability of the skills learned in occupation-specific programs is a common concern about apprenticeships or any occupation-specific training. Several questions are relevant. How likely is the worker to stay in the occupation and/or with the firm? Will the worker be able to sustain the gains from training when moving to another firm but staying in the same occupation? How transferable are the skills learned to other occupations? How do the earnings gains of workers trained in occupation-specific programs compare with those of workers receiving only general postsecondary education?

How skill portability varies with the mode of learning and the curricula is unclear, a priori. As Geel and Gelner (2009) point out, learning even a highly specific skill can yield benefits outside the narrow occupation.

For example, an adolescent who wants to become a clockmaker should not necessarily be considered poorly equipped for future labor market requirements, even though his industry is small and shrinking. Rather, he is well equipped because his skill combination is very similar to skill combinations of other occupations in a large and growing skill cluster, which includes, for example, medical technicians or tool makers. Despite a seemingly very narrow and inflexible skill combination in his original occupation, he is nonetheless very flexible and well prepared for future labor market changes due to the sustainability of his acquired skills and his current skill cluster.

To operationalize the concept of skill specificity, Geel and Gelner (2009) and Geel et al. (2011) begin with an insight borrowed from Lazear (2009) that all skills are general in some sense, and occupation-specific skills are composed of various mixes of skills. The authors compile the key skills and their importance for nearly 80 occupations. They then use cluster analysis to estimate how skills are grouped within narrow occupations. This approach recognizes that skills ostensibly developed for one occupation can be useful in other occupations. It identifies occupational clusters that possess similar skill combinations within a given cluster and different skill combinations between clusters. Next, indices for each narrow occupation measure the extent to which the occupation is relatively portable between occupations within the same cluster and/or relatively portable between the initial occupation and all other occupations. The authors use these indices to determine how portability affects mobility, the wage gains and losses in moving between occupations, and the likelihood that employers will invest in training.

The authors test their hypotheses on the basis of empirical analyses of German apprentices. One finding is that while only 42 % of apprentices stay in their initial occupation, nearly two-thirds remain with either the occupation they learned as an apprentice or another occupation in the cluster using a similar mix of skills. Second, those trained in occupations with more specific skill sets are most likely to remain in their initial occupation or move to occupations within the same cluster. Third, apprentices actually increase their wages when moving to another occupation within

the same cluster but lose somewhat when moving to another cluster. Fourth, as Geel et al. (2011) show, employers are especially likely to invest in apprenticeships with the most specific skill sets.

Other strong evidence of the high returns and transferability of German apprenticeship training comes from Clark and Fahr (2001). They examine the returns to apprenticeship for those who remain in the original apprentice occupation as well as losses that do or would occur from transferring to another occupation. The overall rates of return to each year of apprenticeship range from 8 to 12 % for training in firms of 50 workers or more and from about 5.5 to 6.5 % for firms of two to 49 workers. Transferring to another occupation can offset these gains, but the reduction is zero for those who quit and only 1.7 % for those who are displaced from their job and shift to another occupation.

As found by Geel and Gellner (2009), the wage penalty varies with the distance from the original occupation. There is no penalty at all from displacement into a somewhat related occupation. Göggel and Zwick (2012) show the net gains or losses from switching employers and occupations differ by the original training occupation, with apprentices in industrial occupations actually experiencing wage advantages, while those in commerce, trading, and construction see modest losses. Finally, Clark and Fahr (2001) present workers' own views on their use of skills learned in apprenticeship training on their current jobs. Not surprisingly, 85 % of workers remaining within their training occupation use many or very many of the skills they learned through apprenticeship. This group constitutes 55 % of the sample. But, even among the remaining 45 %, about two of five workers reported using many or very many of the skills from their apprenticeship and one in five used some of the skills. Overall, only 18 % of all former apprentices stated they used few or no skills learned in their apprenticeships.

The findings show that the skills taught in German apprenticeship training are often general. Even when bundled for a specific occupation, the skills are portable across a cluster of occupations. Moreover, apprentices are quite likely to remain in occupations that use the skills they learned in their initial occupation. Apprenticeship skills do vary in terms of specificity and portability. But when the skills are less portable, firms are more likely to make the necessary investments and workers are less likely to change occupations significantly.

The general component of training is presumably stronger in school-based programs, because they are financed by government and/or individuals themselves. For this reason, some favor school-based systems, arguing that firm-based apprenticeship training limits mobility and adaptability (Hanushek et al. 2011). Yet, it is far from clear that these programs, especially the purely academic tracks in U.S. secondary schools and U.S. community colleges, offer more mobility. A high percentage of students drop out of both academic secondary and community college programs. Also, many of the community college programs are at least as specific as apprenticeship programs. Certificate programs within community colleges are almost entirely devoted to learning a narrow occupational skill, such as courses to become a phlebotomist, childcare assistant, or plastics-processing worker. Many U.S. school-based programs take place in for-profit colleges offering narrow

programs, such as truck driving, medical assistant, and medical insurance billing and coding. Furthermore, skills often erode when they go unused. To the extent students learn general skills but rarely apply them and wind up forgetting them, their training is unlikely to offer upward mobility.

While community college and private for-profit students often take highly specific occupational courses, apprentices all take some general classroom courses. Thus, apprentice electricians learn the principles of science, especially those related to electricity. In most countries, collaboration takes place between public vocational schools and apprenticeship programs. In the U.S., apprentices often take their required "related instruction" in classes at community colleges or for-profit colleges (Lerman 2010). From this perspective, apprenticeship programs should be viewed as "dual" programs that combine work- and school-based learning, albeit with an emphasis on work-based learning.

In the case of other OECD countries, the mix of school- vs. employer-based programs used to prepare young people for careers varies widely (OECD 2009, 2010). Secondary school students in Belgium and Sweden participate at high rates in vocational education but have very low rates of participation in work-based programs. In contrast, most of the vocational education in Germany, Switzerland, and Denmark revolves around work-based learning, including apprenticeships.

Apprenticeship training is attractive in limiting the gaps between what is learned at school and how to apply these and other skills at the workplace. An extensive body of research documents the high economic returns to workers resulting from employer-led training (Bishop 1997). Transmitting skills to the workplace works well with supervisory support, interactive training, coaching, opportunities to perform what was learned in training, and keeping the training relevant to jobs (Pellegrino and Hilton 2012). These are common characteristics of apprenticeships. Employer-based training like apprenticeship often bears fruit in the form of higher levels of innovation (Bauernschuster et al. 2009), net gains to firms that train during and soon after the training, and externalities, such as benefits for other employers and the public when workers are well trained to avoid the consequences of natural or manmade disasters. Generally, apprenticeships and other forms of employer-based training are far less costly to the government. Moreover, the government generally gains by paying little for the training while reaping tax benefits from the increased earnings of workers.

What Policies Can Encourage Firms to Adopt Apprenticeship in the U.S.?

Today, apprenticeships make up only 0.2 % of the U.S. labor force, far less than the 2.2 % in Canada, 2.7 % in Britain, and 3.7 % in Australia and Germany. In addition, government spending on apprenticeships is tiny compared with spending by other countries as well as compared with what it costs to pay for less effective career and

community college systems that provide education and training for specific occupations. While total government funding for apprenticeship in the U.S. is only about $100 to $400 per apprentice annually, federal, state, and local government spending annually per participant in two-year public colleges is approximately $11,400 (Cellini 2009). Not only are government outlays sharply higher, but the cost differentials are even greater after accounting for the higher earnings (and associated taxes) of apprentices compared to college students. Given these data, we can attribute at least some of the low apprenticeship penetration to a lack of public effort in promoting and supporting apprenticeship and to heavy subsidies for alternatives to apprenticeship.

However, the historical reasons for apprenticeship's low penetration in the U.S. are less important than the potential for future expansion.[8] Recent experience in Britain and in selected areas in the U.S. suggests grounds for optimism, but the barriers to expansion are significant.

One is limited information about apprenticeship. Because few employers offer apprenticeships, most employers are unlikely to hear about apprenticeships from other employers or from workers in other firms. Compounding the problem is both the difficulty of finding information about the content of existing programs and the fact that developing apprenticeships is complicated for most employers, often requiring technical assistance that is minimal in most of the country. Experiences in England and South Carolina demonstrate that effective marketing is critically important for expanding the number of firms offering apprenticeships.

Another barrier is employer misperceptions that apprenticeship will bring in unions. There is no evidence that adopting an apprenticeship program will increase the likelihood of unionization, but reports about such close links persist. An additional barrier is the asymmetric treatment of government postsecondary funding, with courses in colleges receiving support and courses related to apprenticeship receiving little financial support. Policies to reduce the government spending differentials between college subsidies and apprenticeship subsidies can help overcome this barrier.

Another significant complication to developing more apprenticeships is that U.S. apprenticeships are categorized in three different ways: registered apprenticeships with the Department of Labor's Office of Apprenticeship (OA), unregistered apprenticeships, and youth apprenticeships. Official data generally fail to track unregistered apprenticeships; evidence suggests their numbers exceed registered apprenticeships.[9] Small youth apprenticeship programs operate in a few states. Tiny budgets and an excessive focus on construction have hampered expansion of the registered apprenticeship system. The federal government spends less than $30 million annually to supervise, market, regulate, and publicize the system. Many states

[8] For a detailed look at the barriers to expanding apprenticeship in the U.S., see Lerman (2013).

[9] Data from the combined 2001 and 2005 National Household Education Surveys indicate that 1.5 % of adults were in an apprenticeship program in the prior year (NCES 2008). If these data were accurate, the number of unregistered apprentices would far exceed registered apprenticeship.

have only one employee working under their OA. In sharp contrast, Britain spends about one billion pounds (or about $1.67 billion) annually on apprenticeship, which would amount to nearly $8.5 billion in the U.S., after adjusting for population.

Unlike programs in Austria, Germany, and Switzerland, the U.S. apprenticeship system is almost entirely divorced from high schools and serves very few workers under 25. Only a few states, notably Georgia and Wisconsin, now operate youth apprenticeship programs that provide opportunities to 16- to 19-year-olds. State funding pays for coordinators in local school systems and sometimes for required courses not offered in high schools. In Georgia, 143 of 195 school systems currently participate in the apprenticeship program and serve a total of 6,776 students. These apprentices engage in at least 2,000 h of work-based learning as well as 144 h of related classroom instruction. The Wisconsin program includes one- to two-year options for nearly 2,000 high school juniors or seniors, requiring from 450 to 900 h in work-based learning and two to four related occupational courses. The program draws on industry skill standards and awards completers with a certificate of occupational proficiency in the relevant field. Some students also receive technical college academic credit. In Georgia, the industry sectors offering apprenticeships range from business, marketing, and information management to health and human services and technology and engineering. The Wisconsin youth apprenticeships are in food and natural resources, architecture and construction, finance, health sciences, tourism, information technology, distribution and logistics, and manufacturing.

Bipartisan Initiatives and New Proposals

Both the administration and some members of Congress have proposed expanded funding for apprenticeship. President Obama included $500 million per year for 4 years in his fiscal year 2015 budget. Senators Tim Scott (Republican from South Carolina) and Cory Booker (Democrat from New Jersey) have proposed providing tax credits to employers hiring apprentices.

In December 2014, the Obama administration issued a competitive grant announcement that will allocate about $100 million to expand apprenticeship.[10] The administration used its discretion to apply funds from the user fees paid by employers to hire foreign workers as part of the H-1B temporary immigration program. As a result, the grants are oriented toward expanding apprenticeships in occupations that often use H-1B workers from abroad. The industry areas include advanced manufacturing, business services, and health care. Competitors for the grant will have access to funding of $2.5 million to $5 million over 5 years. The key goal is to increase apprenticeship options for workers, but other goals include reaching out to underrepresented groups.

[10] See U.S. Department of Labor, Employment and Training Administration, Notice of Availability of Funds and Funding Opportunity Announcement for the American Apprenticeship Initiative, 2015 at http://www.dol.gov/dol/grants/FOA-ETA-15-02.pdf

Whether to emphasize apprenticeships beginning in late high school or after high school involves tradeoffs. High school programs improve the likelihood of government funding for academic courses related to apprenticeships. Given the consensus that the government should fund students through secondary school, paying for the related instruction of high school apprentices becomes a nondiscretionary part of budgets. When apprentices are beyond high school, government funding for related instruction must come out of discretionary expenses. International experience demonstrates the feasibility of youth apprenticeships; youth are able to attain serious occupational competencies while completing secondary education.

Apprenticeships in the late teenage years improve the nonacademic skills of youth at a critical time. In countries with little or no youth apprenticeship, structured work experience is less common, limiting the ability of youth to develop critical employability skills such as teamwork, communication, problem solving, and responsibility. Early apprenticeships can help engage youth and build their identity (Halpern 2009; Brown et al. 2007). Apprentices work in disciplines that are interesting and new; they develop independence and self-confidence through their ability to perform difficult tasks. Youth try out new identities in an occupational arena and experience learning in the context of production and making things.

From an economic perspective, apprenticeships for youth can be less costly for employers. Wages can be lower partly because youth have fewer medium- and high-wage alternatives and partly because youth have fewer family responsibilities, allowing them to sacrifice current for future income more easily. While Swiss firms invest large amounts of dollars in their apprenticeship programs, they pay their young apprentices very low wages during the apprenticeship period. Another economic advantage is that starting earlier in one's career allows for a longer period of economic returns to training.

For the U.S., scaling apprenticeship in the last years of high school is difficult. The aversion to tracking students too early into an occupational sequence is a common objection to youth apprenticeship. Importantly, high school officials are generally averse to adding youth apprenticeship to their already extensive agenda, including implementing Common Core standards and school and teacher accountability standards as well as dealing with charter schools and vouchers. In the early 1990s, opposition to youth apprenticeship in the U.S. came from unions and others who worried about eroding the apprenticeship brand with less intensive training programs.

To build a robust apprenticeship system in the U.S., even with new resources, the strategies will require branding at the state and/or federal levels and marketing at both the general and the firm level. I suggest five strategies: two could be accomplished at the state level, and three would be the responsibility of the federal government.

The State Role

Develop High Level and Firm-Based Marketing Initiatives

Britain's success in expanding apprenticeships from about 150,000 in 2007 to over 850,000 in 2013 offers one example for how to create successful national and decentralized marketing initiatives. Alongside various national efforts, including the National Apprenticeship Service and industry skill sector councils, the British government provided incentives to local training organizations to persuade employers to create apprenticeships. A similar model could be developed in the U.S. state governments could build a state marketing campaign together with incentives and technical support to community colleges and other training organizations to market apprenticeships at the individual firm level. However, simply marketing to firms through existing federal and state agencies may not work if the staff lacks the marketing dynamism, sales talent, and passion for expanding apprenticeship. Pay for performance is recommended: Technical education and training organizations would earn revenue only for additional apprenticeships that each college or organization managed to develop with employers.

Every apprenticeship slot stimulated by the college/training organization increases the work-based component of the individual's education and training and reduces the classroom-based component. Assume the work-based component amounts to 75 % of the apprentice's learning program and the school-based courses are only 25 % of the normal load for students without an apprenticeship. By allowing training providers to keep more than 25 % of a standard full-time-equivalent cost provided by federal, state, and local governments in return for providing the classroom component of apprenticeship, the community colleges and other training organizations would have a strong incentive to develop units to stimulate apprenticeships. State and local governments could provide matching grants to fund units within technical training organizations to serve as marketing arms for apprenticeships. The marketing effort should encourage government employers as well as private employers to offer more apprenticeships.

South Carolina's successful example involved collaboration between the technical college system, a special unit devoted to marketing apprenticeship, and a federal representative from the Office of Apprenticeship. With a state budget for Apprenticeship Carolina of $1 million per year as well as tax credits to employers of $1000 per year per apprentice, the program managed to stimulate more than a sixfold increase in registered apprenticeship programs and a fivefold increase in apprentices. Especially striking is that these successes—including 4000 added apprenticeships— took place as the economy entered a deep recession and lost millions of jobs. The costs per apprentice totaled only about $1250 per apprentice calendar year, including the costs of the tax credit.

Build on Youth Apprenticeship Programs

State government spending on youth apprenticeship programs amounts to about $3 million in Georgia and $2 million in Wisconsin. Although these programs reach only a modest share of young people, the U.S. could make a good start on building apprenticeship if the numbers in Georgia could be replicated throughout the country. The focus would be on students who perform better in work- than purely school-based settings and are less likely than the average student to attend college or complete a B.A. degree. To create about 250,000 quality jobs and learning opportunities, the gross costs of such an initiative would be only about $105 million, or about $450 per calendar year, or about 4 % of current school outlays per student-year. Moreover, some of these costs would be offset by reductions in teaching expenses, with more students spending greater amounts of time in work-based learning and less time in high school courses. Having fewer students have to repeat grades will save costs as well. In all likelihood, the modest investment would pay off handsomely in the form of increased earnings and associated tax revenues as well as reduced spending on educational and other expenditures.

Good places to start are career academies—schools within high schools that have an industry or occupational focus—and regional career and technical education (CTE) centers. Over 7,000 career academies operate in the U.S. in fields ranging from health and finance to travel and construction (Kemple and Willner 2008). Career academies and CTE schools already include classroom-related instruction and sometimes work with employers to develop internships. Because a serious apprenticeship involves learning skills at the workplace at the employer's expense, these school-based programs would be able to reduce the costs of teachers relative to a full-time student. If, for example, a student spent two days per week in a paid apprenticeship or 40 % of time otherwise spent in school, the school should be able to save perhaps 15–30 % of the costs. Applying these funds to marketing, counseling, and oversight for youth apprenticeship should allow the academy or other school to stimulate employers to provide apprenticeship slots. Success in reaching employers will require talented, business-friendly staff who are well trained in business issues and apprenticeship.

To implement this component, state governments should fund marketing and technical support to career academies to set up cooperative apprenticeships with employers, either using money from state budgets or federal dollars. The first step should be planning grants for interested and capable career academies to determine who can best market to and provide technical assistance to the academies. Next, state governments should sponsor performance-based funding to units in academies so they receive funds for each additional apprenticeship. Private foundations should offer resources for demonstration and experimentation in creating apprenticeships within high school programs, especially career academies.

The Federal Role

Extend Use of Current Postsecondary and Training Subsidies to Apprenticeship

In nearly all other countries, the government is responsible for the classroom-based component of apprenticeship. One approach to making this jump in the U.S. is to use existing postsecondary programs to finance or at least subsidize the classroom portion of apprenticeships. Already, localities can use training vouchers from the Workforce Investment Act for apprenticeship. To encourage greater use of vouchers for apprenticeship, the federal government could provide one to two more vouchers to Workforce Investment Boards for each training voucher used in an apprenticeship program. Another step is to encourage the use of Trade Adjustment Act (TAA) training subsidies to companies sponsoring apprenticeships just as training providers receive subsidies for TAA-eligible workers enrolled in full-time training. In addition, policies could allow partial payment of TAA's extended unemployment insurance to continue for employed individuals in registered apprenticeship programs.

Allowing the use of Pell grants to pay at least for the classroom portion of a registered apprenticeship program makes perfect sense as well. Currently, a large chunk of Pell grants pays for occupationally oriented programs at community colleges and for-profit career colleges. The returns on such investments are far lower than the returns to apprenticeship. The Department of Education already can authorize experiments under the federal student aid programs (Olinsky and Ayres 2013), allowing Pell grants for some students learning high-demand jobs as part of a certificate program. Extending the initiative to support related instruction (normally formal courses) in an apprenticeship could increase apprenticeship slots and reduce the amount the federal government would have to spend to support these individuals in full-time schooling.

The GI Bill already provides housing benefits and subsidizes wages for veterans in apprenticeships. However, funding for colleges and university expenses is far higher than for apprenticeship. Offering half the GI Bill college benefits to employers hiring veterans into an apprenticeship program could be accomplished by amending the law. However, unless the liberalized uses of Pell grants and GI Bill benefits are linked with an extensive marketing campaign, the take-up by employers is likely to be limited.

Designate Best Practice Occupational Standards for Apprenticeships

To simplify the development of apprenticeships for potential employers, a joint Office of Apprenticeship-Department of Commerce team should designate one or two examples of good practice with regard to specific areas of expertise learned at work sites and subjects learned through classroom components. The OA-Commerce

team should select occupational standards in consultation with selected employers who hire workers in the occupation. Once selected, the standards should be published and made readily accessible. Employers who comply with these established standards should have a quick and easy path to registration of the program. In addition, workforce professionals trying to market apprenticeships will have a model they can sell and that employers can adopt and/or use with modest adjustments. Occupational standards used in other countries can serve as starting points to the Labor-Commerce team and to industry groups involved in setting standards and in illustrating curricula.

Develop a Solid Infrastructure of Information, Peer Support, and Research

The federal government should sponsor the development of an information clearinghouse, a peer support network, and a research program on apprenticeship. The information clearinghouse should document the occupations that currently use apprenticeships not only in the U.S. but also in other countries along with the list of occupation skills that the apprentices master. It should include the curricula for classroom instruction as well as the skills that apprentices should learn and master at the workplace. Included in the clearinghouse should be up-to-date information on available apprenticeships and applicants looking for apprenticeships. The development of the information hub should involve agencies within the Department of Commerce as well as the OA.

The research program should cover topics especially relevant to employers, such as the return to apprenticeship from the employer perspective and the net cost of sponsoring an apprentice after taking account of the apprentice's contribution to production. Other research should examine best practices for marketing apprenticeship, incorporating classroom and work-based learning by sector, and counseling potential apprentices.

Conclusions

Expanding apprenticeship is a potential game-changer for improving the lives of millions of Americans and for preventing further erosion of the middle class. Apprenticeships widen routes to rewarding careers by upgrading skills, including occupational skills but also math, reading, and employability skills. Taking math, reading, and writing in the context of using these competencies in the workforce will increase the motivation of many workers and the efficacy of the delivery process. Given the ability of workers to learn more, remain well motivated, and notice how to make innovations at the workplace, firms will have an increased incentive to adopt "high road" strategies and make them work. Such an approach may be one of the only ways the firm can attract and sustain workers.

Apprenticeships can also increase the efficiency of government dollars spent on developing the workforce. Instead of spending over $11,000 per year on students in community college career programs, why not shift resources toward far more cost-effective apprenticeship programs? Apprenticeship programs yield far higher and more immediate impacts on earnings than community or career college programs yet cost the student and government far less. Community college graduation rates, especially for low-income students, are dismally low. Even after graduating, individuals often have trouble finding a relevant job. For students in postsecondary education, foregone earnings are one of the highest costs. In contrast, participants in apprenticeships rarely lose earnings and often earn more than if they did not enter an apprenticeship. Further, apprentices are already connected with an employer and can demonstrate the relevant credentials and work experience demanded by other employers. Another advantage is the net gains flowing to employers from apprenticeship programs.

The key question is not whether the shift in emphasis from community and/or career colleges toward apprenticeships is desirable but whether it is feasible. Although some argue that the free U.S. labor market and the weak apprenticeship tradition pose insurmountable barriers to scaling apprenticeship, the dramatic increases in apprenticeship in Britain offer strong evidence that building a robust apprenticeship program in the U.S. is possible.

We are well along with the task of persuading policy makers about the desirability and feasibility of apprenticeship. With the Obama administration's grants for the American Apprenticeship Initiative, as of this writing, we were expecting a mix of approaches beginning in the summer of 2015 aimed at expanding apprenticeship. In addition, employers would learn about the returns to apprenticeship as a result of their own experience and expected evaluations. Still, structural barriers remain that limit the development of a robust apprenticeship system in the U.S.

It is past time for federal and state governments to make a genuine effort to build an extensive and high value apprenticeship system. Without such an effort, we will never know whether U.S. employers will follow the patterns of other countries, create a significant number of apprenticeship slots, and recognize the gains to firms from such investments if we do not try. Institutional change of this magnitude is difficult and will take time but will be worthwhile in increasing earnings of workers in middle-skill jobs, widening access to rewarding careers, enhancing occupational identity, increasing job satisfaction, and expanding the middle class.

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Chapter 11
Improving Opportunity Through Better Human Capital Investments for the Labor Market

Harry J. Holzer

Abstract While education levels in the U.S. have risen in recent years, students from disadvantaged backgrounds have fallen behind other Americans in college attainment amid increasing college dropout rates. The causes of this growing gap include weaker academic preparation in their K-12 years (and earlier); lower wealth and liquidity that make it harder to pay tuition and other costs; worse information about and lower familiarity with higher education; and pressure to work full-time while being enrolled to help support their families. In addition, disadvantaged college students are heavily concentrated in weaker and under-resourced institutions such as community colleges, which generate fewer graduates. Even when students gain credentials like associate degrees, the degrees often do not have strong labor market value because of students' poor labor market information and the weak incentives of public institutions to respond to the labor market by creating more classes in high-demand fields. And high-quality career and technical education opportunities in the U.S., such as "sectoral" training and work-based learning, have not been developed to the extent possible to provide students a wider range of pathways to careers from which to choose. Efforts to improve these outcomes must therefore focus on three goals: (1) improving completion rates at our public colleges by strengthening student supports; (2) expanding postsecondary options, at the bachelor's level or below, that have labor market value; and (3) developing additional pathways to good-paying jobs through work-based learning and high-quality career and technical education, beginning in secondary schools.

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Introduction

Since about 1980, labor market inequality has increased quite dramatically in the United States. Gaps in earnings between highly educated workers—such as those with college diplomas or graduate degrees—and those without them have roughly doubled in magnitude. The high labor market "return" to education creates strong incentives for workers to invest in various kinds of "human capital," such as higher education degrees. Indeed, attaining some type of college credential is perhaps the strongest predictor of upward mobility for young people from low-income families, both across generations or within them, so the incentives for the poor to invest in higher education should be as strong as, or even stronger, than for anyone else.

It is therefore somewhat surprising that, during much of the past 35 years, the growth of higher education credentials among young Americans has been quite modest, especially among those from lower- and middle-income families, while gaps in higher educational attainment between children from poor and nonpoor families have actually grown wider during this period. Though there has been a surge in postsecondary educational attainment among young Americans since 2000, and especially since the Great Recession began in 2007, poor children continue to lag behind in such attainment, and earnings gaps between college graduates and others remain very high.

In this chapter I review the factors that limit postsecondary skills attainment among low-income students. I argue that, although the incentives are very strong for poor students to obtain these degrees, a range of personal and institutional barriers as well as market failures often prevent them from doing so.

To improve economic opportunity in the job market, we must therefore enhance the ability of low-income students to obtain college degrees and other credentials that reflect skills that are valued in the labor market. I will argue for a range of policies and practices that should improve the odds that poor young people attain some type of college credential—such as a bachelor's (B.A.) degree and higher, an associate (A.A.) degree, or an occupational certificate. I will also argue that improving a range of other skill-building pathways for poor students—including high-quality career and technical education; various models of work-based learning, such as apprenticeship; and other approaches, such as career pathways and training in particular employment sectors (sectoral training) —would improve their opportunities in the labor market as well.

Investing in Human Capital: Why Does Postsecondary Educational Attainment Lag behind for the Poor?

Theory and Evidence

The theory of human capital investment, as developed by Gary Becker (1996), Jacob Mincer (1974) and others, posits that (all else equal) a rise in labor market returns to any particular skill, or an educational credential that signals the attainment of that skill, should generate higher investments in that skill or credential. So if demand for those with higher education rises in the labor market, and the earnings premium for having a college diploma (relative to high school) increases, more students will enroll in college and obtain that degree. This increase in the supply of college graduates should, in turn, reach a point that it offsets the higher demand and causes the earnings premium to fall to its earlier level.

Of course, this scenario assumes no other complications in the adjustment process, including market failures of any kind, and no other limits on the potential supply of skilled labor. If, for example, there are lags in the time needed for such skill development, then the adjustment process might take many years to complete, and in the presence of imperfect information and foresight among students, the supply of skilled workers over time could potentially overshoot the new equilibrium, causing wages of skilled workers to oscillate, as they have in some markets for highly educated workers (Freeman 1971).

On the other hand, the ability of students to make these additional investments at all might be limited—if, for example, the marginal students in these markets have lower scholastic ability, their information about market returns is incomplete, or they face higher costs of investing in the skills. Indeed, among low-income students, it is quite possible that all of these complications could limit their investment decisions over time.[1]

If the theoretical responses of investments in skills to market increases in pay premia for those skills are therefore somewhat ambiguous, what does the empirical evidence show? The important and well-known book by Claudia Goldin and Lawrence Katz, *The Race between Education and Technology* (2008), offers us perhaps the clearest long-term evidence on this issue. They show that, due to technological developments in a variety of industries, the labor market return to *high school* diplomas rose sharply in the early part of the twentieth century, and in response, the supply of high school graduate labor rose over the first several decades of the century, just as predicted by the human capital model.

Indeed, the process continued until the higher wage premium associated with high school graduation had disappeared by mid-century. Goldin and Katz note that the rise in high school enrollments and graduation reflected not only private

[1] This discussion assumes that the market return to a completed degree is at least as high for the disadvantaged as for other students, which appears to be the case (Backes, Holzer, and Velez 2014).

investment decisions but also a major public policy response to increase the teaching capacities of public high schools and encourage (or require) more such enrollments.[2]

In the last few decades of the twentieth century, a similar process occurred in which technological change (plus globalization and other institutional forces) likely increased the demand for *college* graduates and caused their relative wages to rise as well.[3] But, unlike the earlier episode, there was relatively little rise in the supply of highly skilled workers until the end of the century. Though Autor (2014) notes that higher enrollments in college finally increased the supply of highly educated labor after the year 2000, and especially after the onset of the Great Recession in 2007, this increase was sufficient only to stabilize the premium associated with college rather than reduce it.[4]

Furthermore, Bailey and Dynarski (2011) have shown that the response of college enrollments and attainments to the higher college wage premiums of the 1980s and 1990s varied strongly by family income, with higher responses among high-income students than lower-income ones. Accordingly, the gap in B.A. attainments that already existed by family income grew larger over time. Other evidence (e.g., Holzer and Dunlop 2013) also showed rising enrollments in A.A. programs among poorer students and minorities after 2000, while Whites/nonpoor students showed greater increases in B.A. enrollments and attainments, thus contributing to widening earnings gaps as well.

Explaining the Rising Attainment Gaps among Disadvantaged Students

What accounts for the rising gap in educational attainment between disadvantaged and other students in the past 30 years?

Importantly, we must distinguish *enrollment* rates in higher education from *completion* rates among those who enroll. The data show quite large increases in enrollments over time among the poor and minorities as well as nonpoor and/or White

[2] Mandatory high school enrollment up to a certain age (usually 16) in most states was a mechanism by which higher high school enrollment was required.

[3] College enrollments and supply actually rose substantially in the late 1960s and early 1970s in response to the Vietnam War because college students were deferred from being drafted; this caused the college wage premium to decline substantially in the 1970s (Freeman 1976). But enrollments declined after the war ended, and the positive shift in labor demand for college graduates appears to have begun around 1980. The associated rise in the college premium was not sufficient to dramatically raise the supply of such graduates for the next few decades. Labor economists have long debated the extent to which the rising college premiums of this period mostly reflect labor demand and supply factors (Goldin and Katz 2008); (Autor et al. 2008) or other institutional forces like weaker unions and lower statutory minimum wages (Card and Dinardo 2007).

[4] By most accounts, real wages did not rise for college or high school graduates after 2000, only rising for those with graduate degrees beyond the B.A. (e.g., Mishel et al. 2012–2013).

students. Indeed, some evidence suggests that enrollment rates have come close to converging across these groups, conditional on graduating from high school. And, since high school graduation rates have improved markedly for the poor in the past few decades (Murnane 2013), and certain high school reforms show great success in improving the access of the poor and minorities to college enrollment (Bloom and Unterman 2014), college enrollment rates among minorities and the poor should continue to grow over time. Even among the dwindling numbers of high school dropouts, college enrollment options might also grow among those who obtain a GED as the preparation and tests that determine receipt of this degree grow more rigorous over time.[5]

But college completion rates among enrollees have worsened over time (Bound et al. 2009), with large gaps evident by race and family income, especially at four-year colleges and universities (Holzer and Dunlop 2013). For instance, Holzer and Dunlop show that completion rates at four-year colleges and universities (within approximately 8 years of graduating from high school) average over 60 % for the entire population but just over 30 % for disadvantaged students.[6] At A.A. programs in two-year colleges, completion rates are more comparable across these groups (at about 35 %) but are generally low for all students, and the concentration of disadvantaged or minority young people is much higher at these schools than for middle-class students or Whites.[7]

What accounts for these gaps? The research by Bound, Lovenheim, and Turner and others shows that a number of factors contribute to lower college completion rates among the disadvantaged. These include:

- weaker academic preparation in the K-12 years;
- lower wealth and associated liquidity constraints limiting ability to pay tuition and other college expenses;
- worse information about and lower familiarity with higher education; and
- pressure to support a family by working full-time during enrollment.

If anything, the gaps in earlier academic achievement, and therefore preparation for college, across family income groups have also grown over time (though they have fallen somewhat by race—Magnuson and Waldfogel 2008; Reardon 2011), thus contributing to differences in their educational outcomes. But, even within

[5] The effects of the more traditional GED on college attainment or earnings appeared to be modest at best (Murnane and Tyler 2000; Heckman et al. 2010). Those who pass the newer, more rigorous one will likely show greater impacts on these outcomes, though we do not yet know if pass rates will decline.

[6] Disadvantaged students in this study refer to those from the bottom quarter of the socioeconomic status distribution, which presumably measures longer-term family income better than annual income. The data on completion are derived from the 2000 panel of the National Educational Longitudinal Survey (NELS).

[7] Completion rates are somewhat higher if measured for those in certificate as well as A.A. programs at two-year colleges, though the average wages they generate are lower. On the other hand, completion rates calculated for community college enrollment populations that include adults and not just a cohort of youth out of high school are usually much lower than 35 %.

groups of students with fairly uniform achievement levels, large gaps in completion rates between poor and other students are observed (Backes et al. 2014).

What role is played by the rising costs of higher education in America (College Board 2013b)? If capital markets operated fully efficiently, academically able students from low-income families would be able to fully borrow for whatever human capital investments they were capable of making. But evidence has shown that accumulated family wealth (especially through the housing market) and access to financial aid have some impact on student enrollment and attainment (Lovenheim 2011; Brown et al. 2009), thus suggesting that capital markets are highly imperfect in overcoming wealth differences across families and lack of access to liquid wealth (often known as "liquidity constraints") among the disadvantaged.[8] And, as the financial costs of two- and four-year public institutions continue to rise, because of reductions in state financial assistance to these institutions (College Board 2013b), these constraints may grow more serious over time.

It is also clear that information about the world of higher education is highly imperfect, especially among first-generation college enrollees from disadvantaged families. Indeed, when applying to college, low-income students are much more likely to attend the two- or four-year colleges located closest to where they live, which (for poorer and minority students) are likely lower-tier public colleges; as a result, there is often some significant undermatching between high-achieving students from low-income families and the colleges they attend (Bowen et al. 2005, 2009). Such undermatching appears to at least partly reflect differences in information about school quality available to the disadvantaged compared to other students, as well as in the likelihood of being accepted to higher-quality schools.[9] Accordingly, fairly small increments in information on higher education can have sizable effects not only on whether such students enroll but also where (Goodman 2013; Hoxby and Turner 2014), while assistance with filling out financial aid forms can have a significant impact as well (Bettinger et al. 2012).

Also, full-time work, and therefore part-time enrollment, is strongly associated with lower completion rates (College Board 2013a); this pressure to work is no doubt especially strong among single parents of small children. And a greater lack of social capital and supports among such students likely impedes their ability to successfully complete classes and accumulate credits as well.

[8] In perfect capital markets, high-ability students should have no difficulty borrowing the funds needed to cover the costs of investing in college, as such investments should be regarded by the markets as relatively safe and generating a strong return. But very imperfect information about student ability or other factors reduces the funding available for investments in higher education; this, in turn, forces students to rely more heavily on their own family income or wealth, which causes many from lower-income or lower-wealth families to be "liquidity constrained." It is also likely that disadvantaged students choose to rely less heavily on loans, the repayment and debt servicing of which might be more burdensome to, and impose more risk on, those with lower incomes (unless repayment were fully income-contingent).

[9] Undermatching could, of course, also reflect personal preferences if disadvantaged students might feel more out of place at more elite schools socially or worry about the higher costs of attending.

On top of these *personal* factors, the *institutions* they attend matter as well (Bound et al. 2009). Even controlling for K-12 achievement, students who attend four-year colleges have much higher completion rates than those at two-year colleges, as we noted above, and within the former group, completion rates rise with college quality. In other words, given groups of students are more likely to graduate when they attend elite private colleges and universities, as well as the flagship state universities, than when they attend less selective public colleges. And it is in the less selective colleges and universities that much of the recent increases in college enrollments have occurred. Thus, raising the access of lower-income youth to four- instead of two-year colleges, and to more selective ones within the former, might actually raise their graduation rates.[10]

Why do completion rates vary by institution? For one thing, the elite colleges have much more resources per student and can provide a range of academic and personal supports that cannot be matched at less selective schools. They also provide other benefits to students struggling to finish their degree programs. For instance, the more affluent schools can afford more sections of courses, thus enabling more students to fit them into their schedules; at the less selective schools, more rigid scheduling makes it harder for students to complete their chosen programs—especially if the students are working full time. The higher quality of the student peer groups at the more selective schools likely also contributes to these effects (Sacerdote 2001).

Even within institutions, finishing a program depends on what supports are available to students and also to their chosen fields of study. The data tell us that, all else equal, those majoring in science, technology, engineering or math (STEM) have somewhat lower completion rates, as the level and difficulty of work required in STEM classes is higher and requires greater levels of earlier math preparation (Backes et al. 2014).

But, perhaps more surprisingly, the harder fields of study are not always the ones with the lowest completion rates. Using administrative data from the state of Florida, Backes, Holzer, and Velez find the lowest completion rates in both two- and four-year colleges among those majoring in fairly nondescript humanities fields like "general studies" or "liberal studies." And large subsets of students end up in these fields, especially in A.A. degree programs and among disadvantaged students.[11] Rates of completion are also higher in more technical certificate programs than in A.A. programs, perhaps partly because the former are completed much more quickly.

[10] This argument, of course, runs counter to the one frequently made that affirmative action actually hurts the educational attainment of minorities by enabling them to attend school where they are too disadvantaged academically to succeed. The evidence in support of this claim does not appear persuasive (Holzer and Neumark 2006).

[11] In the Florida data, 55 % of students in A.A. programs overall major in the humanities, usually reflecting "general studies" or "liberal studies," while for disadvantaged students (defined here as those eligible for free or reduced-price lunch) the comparable fraction is 60 %.

Another type of institution is the for-profit colleges, which have recently grown in size and now consume quite large fractions of federal student aid.[12] Recent analysis (Cellini 2012; Deming et al. 2013) shows lower completion rates in the for-profit schools, somewhat lower earnings among those who complete them, and higher debt burdens among those who do not complete them.

What About Earnings?

Ultimately, the institution of higher education that one attends, the field of study one chooses, and the degree that one does or does not complete all have important effects on one's future earnings.

As is widely known, the average labor market returns to the B.A. degree (relative to a high school diploma) have roughly doubled since 1980, and now those with B.A.'s earn nearly 80 % more than high school graduates (Autor 2014). For those who have continued beyond the B.A. and completed some type of graduate degree, returns have grown even more substantially; this has occurred even in the past decade or so, when the returns to the B.A. have flattened (as enrollments and attainment of the B.A. have risen).

Returns to the A.A. degree have also risen over time, especially for females, though not by as much as those for B.A. degrees and higher (Kane and Rouse 1995; Acemoglu and Autor 2010; Bailey and Belfield 2013).[13] But vocational certificates can generate important earnings gains for low-income students as well and take much less time to complete than A.A. or B.A. degrees. In fact, those with certificates in high-demand or technical fields—such as health care or advanced manufacturing—frequently earn more than those with A.A.'s (and even some with B.A.'s) in humanities or "liberal studies," though less than those with more technical A.A. degrees (Backes et al. 2014).[14] More generally, the field of study one chooses has very large effects on earnings, implying that the average return to a particular academic credential can be somewhat misleading about any particular individual's true prospects.

[12] For instance, over a quarter of Pell financial aid now goes to students at for-profit schools (College Board 2013b).

[13] To infer changing returns over time, the estimated returns to community college in Bailey and Belfield can be compared to those estimated earlier in Kane and Rouse, though the data and samples used differ somewhat between the two studies. Acemoglu and Autor (2010) use consistent data and sampling methods over time, but they only list years of schooling completed rather than the A.A. degree. One can roughly infer the changing returns to the A.A. degree over time in their work by looking at returns for those with 14 years of schooling.

[14] Carnevale et al. (2011) and Owen and Sawhill (2013) also emphasize the high variance in returns across fields and the fact that the earnings of some certificate or A.A. degree holders can exceed those of B.A. holders at the lower end of the B.A. distribution.

For those who do not complete their degree programs, there is still some return in the form of higher earnings to credits attained. But those who drop out of two- and four-year college programs often do so before they have attained many credits, in addition to losing the "sheepskin effect" of completing and attaining the degree. This is especially true for those with poor academic preparation in the K-12 years, who often need remediation when they attend community colleges and cannot take many courses for credit until they have successfully completed these remedial programs (Bettinger et al. 2013; Long 2014).

All of this implies that many college-going students from disadvantaged families will ultimately enjoy much less economic success than the average earnings of college graduates imply. Too many of them will go to A.A. programs or less selective four-year colleges where completion rates in general are low; once there, some will likely be trapped in non-credit-bearing remediation classes from which they cannot emerge. Others will choose fields of study at these institutions with even lower-than-average completion rates and low labor market compensation. And many will drop out before having accumulated enough credits to gain much compensation, even in fields that the labor market does value.

Besides the weak academic preparation that many of these students bring to college, and the generally low resources of the institutions they attend, are there other problems which lead to the discouraging outcomes we've described? I believe there are problems of too little *information* and too weak *incentives* at the community colleges and other public four-year colleges and universities.

Most students get virtually no career (or even academic) counseling before or during college; most never obtain any workforce services of the type routinely provided in a jobs (or "one-stop") center financed by the U.S. Department of Labor. Indeed, the student experience at most two-year colleges has been described by one prominent researcher as a "shapeless river" in which students float along but receive little structure or guidance, and little assistance even while navigating across programs (Scott-Clayton 2011; Jenkins and Cho 2012). This stands in sharp contrast to some traditional proprietary vocational colleges (Rosenbaum 2002), where course-taking and curricula are very structured and job placement assistance is strong. Though some studies (Wiswall and Zafar 2013; Long et al. 2014) show that new information on the labor market has just limited influence on student choices, it seems likely that these effects would be greater among the disadvantaged (whose choices right now seem to reflect so little attention to market returns).[15]

But, even if student choices were better informed and therefore more optimal, they would be constrained by limited teaching capacity in high-demand fields and other institutional features that are common at two-year colleges and the less prestigious four-year programs where resources are very limited. Because instructors

[15] Altonji et al. (2012) reviews the literature on choices of student major and emphasizes how early choices about studying certain fields (like math and science), often made under great uncertainty about the future, constrain later choices of major in response to labor market developments.

and equipment are frequently more expensive in the high-demand fields, and because subsidies from most states are still based primarily on student "seat time," regardless of academic or subsequent labor market success; college administrators have little incentive to expand instructional capacity in these high-cost fields (Holzer 2014).[16]

Are There Other Pathways to Labor Market Success Besides College?

One of the reasons that returns to college have grown so much in the U.S. is that those for a high school diploma have diminished, especially for young men. Indeed, most American employers have little reason to believe that the average high school graduate brings occupational or technical skills to the workplace that they will value, or strong communication or analytical skills, or even strong basic cognitive ones. Indeed, on a recent test of skills among workers in 24 Organisation for Economic Co-operation and Development (OECD) countries, Americans scored quite low on literacy or problem-solving proficiency and especially on numeracy; this was especially true among those without postsecondary education. And the skills of non-college-going high school graduates have diminished in recent years as college enrollment rates have risen, so the pool of non-college-going high school graduates looks relatively worse over time.[17]

Yet in other European countries like Germany, employers are willing to pay high school graduates more, at least partly because they know these young people will bring some analytical and technical skills to jobs that they value. The same seems much less true in the U.S. today.

For students who might not be bound for college or universities right away, especially right after high school, a range of other approaches to enhance their labor market skills are being developed and implemented in a number of states and localities. These include high-quality career and technical education programs in high school, work-based learning models like apprenticeships, and innovative approaches to adult training like sectoral models. We consider each of these approaches below.

[16] While Rosenbaum's (2001) study argues that proprietary occupational colleges more successfully link their students to the labor market than do community colleges, the recent evidence on the broader category of proprietary (or for-profit) colleges has been less positive (Deming et al. 2013).

[17] See OECD (2013) for results from a new cross-national evaluation of adult literacy known as PIAAC (Programme for the International Assessment of Adult Competencies), which largely confirm earlier findings from the PISA (Programme for International Student Assessment) tests given at earlier ages.

Career and Technical Education

Traditionally, non-college-bound students, especially those from minority or disadvantaged backgrounds, have enrolled in vocational education in the U.S. or been "tracked" there against their will. These programs prepared students mostly for low-wage jobs, often in declining sectors. Beginning in the 1960s, resentment from minority families and communities over tracking led to declining enrollments in these programs, though they were not reformed for decades. Even when the school-to-work programs of the 1990s briefly received federal funding (Neumark 2007), traditional vocational programs went largely untouched. And, though their quality has improved somewhat in recent years, career and technical education (CTE) programs have not become a large-scale alternative to academic programs that prepare students for "college only."[18]

But a number of newer CTE models have been emerging that no longer force students to choose between college and "career" and instead try to prepare them for both (Holzer et al. 2013). Best known of these programs are the career academies, which are programs within more general high schools that prepare students for careers in a particular sector, such as health care, information technology, or finance. Students take courses within the academy as well as outside of it and often find part-time or summer work within the sector. Evaluation evidence shows strong and lasting impacts on the earnings of enrollees, especially disadvantaged young men, whose earnings remain nearly 20 % higher than those in the control group 8 years after enrollment, at least partly because of the greater labor market exposure that academy students receive (Page 2012). There is also no evidence of lasting effects (positive or negative) on high school completion or college enrollment (Kemple 2008). More recent versions of career academies put more emphasis on maintaining strong college preparatory curricula while still maintaining the emphasis on specific sectors and careers.

Other models, perhaps less well known or less rigorously evaluated, also try to prepare students for both college and careers. These include the High Schools that Work in many Southern states; Linked Learning in California; and high-tech high schools (Holzer et al. 2013). High school programs that provide strong career-based instruction and a seamless entry into college (especially the kinds of "early college high schools" reviewed in Schwartz and Hoffman 2014) look particularly promising. Virtually all students at these schools get some career exposure and exploration. Wherever possible, high-quality academic material is incorporated into work- or project-based learning to contextualize the material and make it more relevant to students. Links to employers in targeted industries, and professional development

[18] Some recent changes have been driven by the latest reauthorization of the Carl T. Perkins Act in 2007, which provides $1 billion for state and local CTE programs. The current version of Perkins requires states to identify growing or high-wage "career clusters" and to generate "paths of study" to move students into these sectors. There is also evidence that the extent to which CTE students take math and science courses in high school has risen in recent years. See Holzer et al. 2013.

for staff, is emphasized as well. A network of "pathway states" aims to expand the best models and increase student and school participation in them.[19]

Work-Based Learning

Work-based learning models, sometimes called "learning while earning," have enjoyed a recent surge of interest, even outside of school CTE programs. These models include internships, co-op programs at colleges, apprenticeships, and "career pathways."

Many such programs provide students with paid work experience as well as a postsecondary credential of value in the labor market (Holzer and Lerman 2014b). At a time when young people are experiencing low employment rates (due to the Great Recession and weak labor market recovery afterward), combining work experience with postsecondary attainment is an appealing option. The paid work experience might better motivate low-income students to complete their training and also contextualizes the learning.

Apprenticeships, in particular, give students strong paid-work experience while they gain an occupational credential. Early on, the wages they receive might be somewhat below market levels so employers don't have to fully bear the cost of such training.[20] But this means that public sector costs are quite low, while employers also seem to like the program. German companies, in particular, have introduced such programs in the U.S., though not necessarily in identical form to the well-known apprenticeship model widely used in Germany.[21]

In the U.S., certain states—like South Carolina, Wisconsin, and Georgia—are encouraging employers to expand apprenticeships through marketing campaigns and modest financial incentives to help offset costs (Lerman 2014). Indeed, while employers often find them appealing, few would develop them completely on their own due to a variety of market failures.[22]

Incumbent worker training is another model of work-based learning. A range of states have provided subsidies for such training, at least before the Great Recession began (Hollenbeck 2008). The training was mostly limited to nonprofessional and

[19] Much of this work has been based on an influential report entitled *Pathways to Prosperity* (Symonds et al. 2011). See also Hoffman (2011).

[20] As Becker has pointed out, the more general the training, the less employers will be willing to pay for it, because workers could leave at any time before employers recoup the costs of their investments.

[21] Nelson Schwartz, "Where Factory Apprenticeship is Latest Model from Germany." *New York Times*, November 27, 2013.

[22] Economists, in particular, often wonder why certain activities that benefit both workers and employers are not undertaken more frequently on their own. A range of market failures, such as high fixed costs for organizing such programs, limited information about their benefits, and wage rigidities (such as the minimum wage) that limit firms' abilities to share training costs with workers, could impede these undertakings.

nonmanagerial starting employees, and the training was usually designed to help them advance within the companies (or to prevent them from being laid off). To prevent the training from being too narrowly focused (or too "customized," in more modern lingo) on the needs of the specific employer, especially when public funds for the training are being provided, the states attempt to ensure that skills are at least somewhat general and "portable" to other employers and sectors. Evidence suggests positive impacts both on workers and on their performance in the workplace (Holzer et al. 1993; Ahlstrand et al. 2003; Hollenbeck 2008.)

Sectoral Training/Career Pathway Programs

Training outside of the workplace that nonetheless targets jobs in a particular growing or high-wage sector, with the active involvement of particular employers, is known as "sectoral training." Workforce intermediaries bring together employers in that sector, training providers (either community colleges or others) and workers. The intermediaries help provide the workers with access to needed supports and services, including transportation and childcare. The intermediaries also work with providers and employers to make sure that the training fits the employers' needs. If successful, employers come to trust the intermediaries over time to screen workers and refer only those with strong skills and work habits.

Rigorous evaluations (Maguire et al. 2010; Roder and Elliott 2011) have shown that sectoral programs can generate large impacts on the earnings of adults and youth—of 30% or more—within 2 years of the onset of training. But the training generally works only for disadvantaged workers with quite strong basic skills and job readiness rather than the "hard to employ." Questions also remain about the extent to which impacts survive over time, particularly after workers leave their current jobs and maybe even that sector of employment.

Many states have begun efforts to scale up "sectoral" models by creating partnerships between community colleges and employers or industry associations (National Governors Association 2014). Efforts in many cities and substate regions of the country have been undertaken as well (National Fund for Workforce Solutions 2014).[23] The Obama administration has also embraced "demand driven" or "job driven" training as ways to meet the needs of the long-term unemployed and other disadvantaged workers.[24]

But little data exists to date measuring the outcomes achieved, in terms of numbers of workers trained or employed in these broader efforts, much less what the

[23] The National Fund is an effort funded by several philanthropic foundations to expand and scale sectoral training models at the city or regional level. It currently operates at over 30 sites around the country.

[24] See the White House (2014) for a very recent report by the Office of the Vice President on how to encourage more state and local workforce boards to engage in demand-driven (or "job driven") training.

impacts are on worker earnings. Tensions can sometimes exist between the time it takes to build local or state "partnerships" between employers, intermediaries, and service providers, on the one hand, and the often-changing skill needs of employers and workers in a dynamic labor market on the other. Making sure that these models are not just windfalls for employers who would otherwise provide the training themselves, or that the training serves at least somewhat disadvantaged workers—whom employers might be reluctant to hire—requires some vigilance on the part of intermediaries or state officials.

Finally, a number of states are trying to develop "career pathways" that combine classroom work in a certificate or A.A. program with various amounts of work experience as they move up an occupational ladder of some type. For instance, students might first become a certified nursing assistant and then a licensed practical nurse, with some ultimately becoming registered nurses. A network of states are receiving technical assistance and support for developing a range of these programs (CLASP 2014) within broader career pathway "systems." But little evidence exists to date on the impacts of these efforts (Fein et al. 2013).

Policy Implications

Based on the preceding discussion, a policy agenda to expand opportunities of disadvantaged Americans to build more labor market skills would include the following goals:

- improve completion rates at two- and four-year colleges;
- expand postsecondary options that have labor market value; and
- develop additional and alternative pathways to skill-building and work experience through expanding high-quality CTE and work-based learning

Improving College Completion Rates

Perhaps the best thing we could do to improve college completion rates for disadvantaged students would be to improve their academic preparation in the K-12 years. An enormous research and policy literature already exists on this topic, to which I can add relatively little. But it is clear that any such policies need to emphasize both equity and accountability, with more resources going to poor students and communities and strong performance incentives guiding their use. This can be accomplished with stronger curricula (which could be encouraged through widespread implementation of the Common Core and its Next Generation Science Standards), teacher professional development, and incentives based on teacher performance in salary determination, along with higher compensation for strong teachers in math

and science and in segregated or high-poverty areas.[25] High school reforms that are modeled on successes like the Small Schools of Choice in New York, along with other dropout prevention efforts (Balfanz 2010), would help as well.

Given their K-12 performance, increasing the access of disadvantaged students to better colleges and universities would clearly improve their education and employment outcomes. One way to do so would be to provide better information on college choice to high school students as they prepare to apply for college. The evidence to date indicates that even small and low-cost improvements in disseminating information among such students can improve the quality of the colleges to which they apply (Hoxby and Turner 2014). Merely requiring all students to take the ACT exam can generate more information about college quality for these students, which ultimately increases enrollments at better colleges (Goodman 2013; Hyman 2013). Changes in recruitment practices, with flagship and elite colleges reaching out to more disadvantaged students and/or those in poorer neighborhoods, would help as well.

Once disadvantaged students apply more frequently to better colleges, they might also be given better chances of being accepted in the admissions process—through some adjustment of the relative weights applied to traditional academic performance measures (like grades and especially standardized test scores) versus disadvantaged backgrounds and other measures of merit and character (Bowen et al. 2005, 2009). To some extent, this is happening already, as the flagship public universities feel pressure to adjust their affirmative action admissions policies; though the Supreme Court has not yet fully struck-down race-based admissions policies, it has clearly indicated it regards them as its least preferred method of increasing diversity on campuses.[26] Using family- or place-based measures of disadvantaged in place of race in admissions decisions will likely generate student bodies with somewhat lower representation of Blacks and Hispanics but higher representation of low-income and disadvantaged students of all races (Long 2004).

Of course, another way of improving the access of disadvantaged students to better-resourced colleges and universities would be to redistribute public resources more equitably between flagship and nonflagship schools. The evidence suggests that state higher education subsidies may be regressive, given the greater generosity most state legislatures show to their flagship schools (though the exact evidence depends on the range of public resources that are included in the calculations).[27] Of course, these legislatures tend to believe that the flagships contribute more to state

[25] See, for instance, the report by the Equity and Excellence Commission (U.S. Department of Education 2012b; Duncan and Murnane 2014; Chetty et al. 2011.

[26] In its most recent ruling on affirmative action in higher education admissions, in Fisher v. University of Texas, the Supreme Court affirmed that race could be used as one of many factors to generate a diverse student body, but only if it had exhausted all other potential remedies and found them to fail in generating such diversity.

[27] See Hansen and Weisbrod (1969) for the beginning of a longstanding argument on the regressive nature of state subsidies to higher education, and Johnson (2005) for evidence that these subsidies are more income-neutral when we also consider the progressive nature of the state taxes that finance them.

economic development, and their alumni tend to be well represented among (or influential with) state legislators, making any such redistribution very hard to achieve.

Still, we spend nearly $200 billion of public funds each year on higher education in America, and perhaps those funds could be spent more efficiently and generate a stronger set of academic outcomes. For one thing, a range of supports provided to improve academic outcomes are in need of some reform. These include financial aid, developmental (or remedial) education, tutoring/coaching, and the formation of learning communities.

Individual financial aid can come from the federal government in the form of Pell grants, loans, and/or work study; the institutions themselves also provide such aid. The research evidence suggests that simplicity and transparency increase student access to aid, while conditioning continuation of the aid (at least to some extent) on satisfactory academic outcomes (for example, through merit scholarships) improves performance incentives and outcomes (Dynarski and Scott-Clayton 2007; Patel et al. 2013).[28] A set of Pell grant reforms have been suggested recently based on these principles (College Board 2013a; Baum and Scott-Clayton 2013). Student loans, which have recently become more burdensome to students who drop out of college or have some difficulty finding well-paying jobs after graduating, could also be made less burdensome by moving repayments to an income-contingent basis, among other reforms (Akers and Chingos 2014).[29] And even providing assistance to low-income parents as they fill out financial aid forms seems to help (Bettinger et al. 2012).

The methods by which two-year and four-year colleges choose students for remediation, and then deliver it, are greatly in need of reform (Long 2014). Students are often required, for instance, to pass Algebra I, though this math is not necessary for the occupational degree in question, or they are required to pass other exams that are often shown to be unrelated to subsequent student performance in for-credit classes (Scott-Clayton 2012).[30] In its current form, the provision of remediation generally has little positive effect on academic outcomes of students or even negative effects (Clotfelter et al. 2013).[31]

[28] On the other hand, Cohodes and Goodman (2014) show evidence that generous merit scholarships to in-state public university students can actually reduce the quality of the institution they attend, thus reducing college completion rates as well.

[29] Susan Dynarski, "What We Mean When We Say Student Debt Is Bad." *New York Times*, August 8, 2014.

[30] While math proficiency generally and skill in algebra specifically (Holzer and Lerman 2014a) seem to contribute to one's earnings, there is much less evidence that proficiency in algebra contributes to success in completing community college or to the earnings of these students. Long (2014) argues that literacy might be more foundational for these students in terms of their ability to complete college classes.

[31] Negative effects might occur, for instance, if students have only limited time or financing for higher education and such time is consumed in non-credit-generating remediation rather than credit-accumulation in real courses.

Accordingly, reforms that would accelerate remediation and integrate it into teaching or training classes would likely be successful (Bettinger et al. 2013). One such model, the Integrated Basic Education and Skills Training (I-BEST) program in the state of Washington, has generated strong outcomes and is regarded as a promising (though expensive) alternative to standalone remediation (Zeidenberg et al. 2010). Delivery of remediation could also be made more effective by accelerating it and better integrating it into labor market training or information.

The provision of a range of other supports—such as childcare or other income supports—can be made more accessible by programs like "Single Stop," which applies the one-stop concept of service delivery at college (often two-year) campuses. Mandatory participation of students in counseling or support classes has shown some benefits, as has "coaching" more in general (Bettinger et al. 2012). Requiring students to attend class full time while giving a generous package of income and other supports (as done in Accelerated Study in Associate Programs, or ASAP, at the City University of New York), can improve program completion rates as well (Scrivener and Weiss 2013).

Expanding Postsecondary Options with Labor Market Value

As indicated above, it is not enough just to increase college completion rates for disadvantaged students; we also need to improve the labor market value of the credentials they seek and attain.

States and regions are setting up many partnerships between community colleges and employer groups, with the hope of expanding sectoral training and career pathway programs that better connect disadvantaged workers to high-demand sectors and good-paying jobs (National Governors Association 2014). But before these efforts can replicate the best programs and achieve some real scale, some other reforms must be undertaken to address the problems of limited student information and institutional incentives described above.

On providing information, we need to undertake a major effort to improve the availability and quality of career counseling that students get. Ideally, this would begin in high school for every student. But as students approach either two- or four-year colleges, especially in the public sector, they should obtain counseling on career pathways and job availability in their state and region as well as nationally. This counseling could be delivered through the nation's job centers (formerly called One-Stops), though now most students never set foot in them. The job centers could perhaps be expanded with satellite offices on public campuses, especially community colleges, with appropriate efforts to ensure the quality of counseling will be maintained or improved. Online data sources (such as College Measures) that provide detailed information on earnings among graduates of specific colleges could also help in this regard.

Importantly, the data needed for such up-to-date counseling efforts are becoming more available. With federal support and encouragement, states are linking their college and labor market administrative data at the micro level and making them more accessible to researchers and policy makers (Zinn and Van Kluenen 2014). Such data could be summarized on an annual basis and presented in a manner that counselors could use to better inform student decisions, especially for those seeking an occupational credential.[32]

A variety of approaches could be used to improve the incentives of colleges and employers to increase job-relevant training capacity. Some of these have been incorporated in the recently reauthorized Workforce Innovation and Opportunity Act, though its capacity and budget remains quite small (National Skills Coalition 2014); and the Office of the Vice President has recently published a report on a variety of other ways of encouraging more "job driven" training (White House 2014).

In addition, I think it is important to impose some accountability through performance-driven subsidies for public colleges at the two- and even four-year level (Holzer 2014). A number of states are, in fact, beginning to do so (National Conference of State Legislatures 2014) by tying their subsidies for specific colleges to a range of student academic outcomes in a variety of ways. I would expand this approach to include postcollege employment as well as academic outcomes among the ones that determine the levels of subsidies, and with heavy weight on both sets of outcomes for disadvantaged or minority students. The federal government could also use a variety of competitive grants programs to encourage the states in this endeavor.

The administrative data described above are uniquely suited to the purpose of implementing this strategy. And there are other pitfalls that would need to be avoided—e.g., colleges would now have an incentive to "cream" or "skim" by admitting higher-quality students than before. But careful implementation of these standards, perhaps using some type of value-added measures for labor market performance among a college's enrollees and graduates (or "risk adjustment" based on their initial characteristics), could help avoid these pitfalls while we learn what really works or doesn't in this area (Bailey and Xu 2012).[33]

[32] See Jacobson (2013) for a vision of how individual students might ultimately use such data to calculate average completion rates and subsequent earnings for students like themselves at particular colleges or universities and with particular majors at each of them. At least potentially, students might be able to make much better-informed choices about colleges to attend and majors to pick using such data.

[33] The "Gainful Employment" regulations recently implemented by the U.S. Department of Education, on for-profit colleges and certificate programs at public ones, are another attempt to impose accountability, by focusing on debt incurred relative to incomes earned by students after college.

Expanding High-Quality CTE and Work-Based Learning

High-quality career and technical education, beginning in high school and then continuing in college (through career pathway programs), could provide disadvantaged young people with a wider range of options leading to ultimate economic success. Apprenticeships and other work-based learning models could also play an important role.

The expansion of these programs, through the replicating and scaling of apparently successful models, would once again need to occur mostly at the state and local levels. A variety of states are already moving in this direction, working with major employers to increase education and training options for work in their industries.[34]

The federal government could, once again, play a more useful role in this process. By distributing roughly $1 billion in funding to states and localities through the Perkins Act, the federal agencies already have a vehicle through which they can encourage the adoption of higher-quality CTE models with more universal appeal. Recently proposed reforms to Perkins (U.S. Department of Education 2012a) would help such an effort, though there is always resistance from the CTE community to implementing them.[35] The Labor Department's Youth Career Connect grants could also encourage this process. And the Obama administration's recent announcement of a grants program to encourage apprenticeship (Wilson 2014) could also be the first of a number of steps to expand them as well.

Conclusion

Above I have listed a set of factors that render higher education in the U.S. less effective at helping disadvantaged students gain skills and labor market success than it otherwise might be. These factors include the weak academic preparation of poor students, the financial constraints they face, and their poor information about college options; they also include the relatively lower quality of the institutions (both two- and four-year, both for- and not-for-profit) that they attend, and the weak information about the labor markets that limit their choices, as well as the weak incentives for colleges to respond to that labor market. I then outline a set of policies and programs at the federal and state levels to improve college completion rates, labor market success for college graduates (at both the two- and four-year levels), and access to high-quality career and technical education as well as work-based learning among those students.

But a number of factors, both economic and political, could limit the effectiveness of these approaches. For one thing, a full 7 years after the beginning of the

[34] See Jobs for the Future (2014).

[35] See, for instance, Association of Career and Technical Education (2012).

Great Recession, our nation's job market remains relatively weak, and young workers continue to show greatly reduced employment and earnings as a result (Altonji et al. 2014).[36] Because education and training are designed to prepare a more skilled supply of labor to meet employer demands, any such ongoing weakness might make these approaches less successful—especially if we train lots of individuals for jobs that they cannot get afterward. We hope that the nation's slow but steady recovery from this downturn will proceed and that its overall sluggishness will not continue to weaken the job market outcomes of young people indefinitely.[37]

Even if the labor market strengthens in the aggregate, labor demand now seems very dynamic and fluid across sectors of the economy. This means skills that are in high demand today might not be tomorrow as labor demand shifts (because of new technologies and globalization) often occur in unpredictable ways. Accordingly, workers trained for specific careers and sectors must also have a broad range of "portable" skills, some general and some specific, that will enable them to move between firms and sectors over time. Ongoing availability of assistance in retraining (or what some observers call "lifelong learning") as well as finding new sectors of employment should also be part of any such plan.

An ample supply of well-educated workers would hopefully also encourage employers to demand more of their labor rather than more fully automating their workplaces or sending such jobs overseas. The recent arrival of several hundred German manufacturers in the U.S. in the last few years and their expansion of production facilities here (while domestic companies continue to cut back in this area) indicates the potential for labor demand expansion if we were to generate a well-trained labor force over time[38]

Regardless of what policies we implement in this area, large numbers of American workers will have weak education and skills as well as low earnings over

[36] As of late 2014, the national unemployment rate hovers around 6 %. But no doubt this figure understates the degree of slack in the labor market, because many job-seekers have either dropped out of the labor force (Jared Bernstein and Harry J. Holzer. "A Win-Win Approach to Increase the Future Labor Force," PostEverything, *Washington Post*, September 11, 2014) and/or taken part-time jobs when they prefer full-time ones.

[37] Some commentators (e.g., Lawrence Summers, "On Secular Stagnation," *Reuters*, December 6, 2013) have suggested that the U.S. might be experiencing "secular stagnation," in which we cannot generate sufficient aggregate demand to move us back toward full employment. But Summers ("Supply Issues Could Hamper US Economy," *Washington Post*, September 7, 2014) and others have also worried about declines in labor force participation, perhaps partly in response to poor labor market opportunities, that occur even among those well below retirement age and which could limit potential economic growth over time. See Bernstein and Holzer (2014) for suggestions on how job training and work-based learning programs could be used to expand the earnings potential and labor force participation among these groups.

[38] For instance, the Siemens Corporation built a gas turbine engine manufacturing plant in North Carolina in 2012–2013, but only after it had made arrangements with local community and 4-year colleges to generate a steady stream of technicians and engineers for employment there. On the other hand, the German companies seem to come primarily because of proximity to the U.S. consumer market, low energy prices, and low regulations. We do not want to assume that any increase in the supply of skilled labor will automatically generate its own demand.

time. Accordingly, increases in a range of other work supports will be necessary—including expansions of the earned income tax credit (EITC) for those who currently benefit very little, like childless adults and noncustodial parents; and paid parental leave.[39] Moderate increases in the federal and state minimum wages could supplement these reforms (Sawhill and Karpilow 2014),[40] while efforts to address a specific set of barriers in the labor market—for instance, for those with criminal records—would be helpful as well (Council of State Governments 2013).

In addition, the nation's political and fiscal situations remain fairly bleak, especially at the federal level. Political polarization and paralysis limit federal action on almost any issue, and the combination of low taxes and very high spending on retirement programs will limit our ability to act for years (or likely decades) to come.

Yet, if we can devise policies to make our ongoing public expenditures (of nearly $200 billion) more effective without requiring much in the way of new resources, such actions could still draw some bipartisan support. And, if federal action fails to materialize, perhaps a more practical set of executives and legislators at the state level could move ahead on this agenda.

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[39] See MDRC (2014) for a description of this promising pilot study that increases the EITC available to childless adults in New York City. Also see Waldfogel (2007) for policy suggestions on how to expand paid leave availability for (low-income) parents.; Nelson Schwartz, "Where Factory Apprenticeship is Latest Model from Germany." *New York Times*, November 27, 2013.

[40] Economists typically fear that higher minimum wages could reduce employer demand for low-wage workers. The research evidence suggests that such effects are likely modest (or even zero), as long as they are moderate in magnitude—which means kept at 50 % or below the median worker's wages (Neumark and Wascher 2009; Dube 2014). Indexing the legal minimum to either inflation or the median wage would keep it from eroding over time, though if it is indexed at a relatively high level this could also generate larger disemployment effects (Harry Holzer, "Pitfalls of Pay Increases," *Washington Post*, December 10, 2013).

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Part IV
Politics and the Road Ahead