

Too Big To Fail:

Millennials on the Margins



THE ETS CENTER FOR
RESEARCH ON HUMAN CAPITAL AND EDUCATION

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Preface

Over the past decade, we at the Center for Research on Human Capital and Education at ETS have been using data from national and international comparative surveys to better understand the importance of key cognitive and workplace skills in the lives of individuals. One of the clear messages emerging from this work is that skills exert a significant influence not only on individual life outcomes but on the well-being of our societies.

The demands of technologically infused economies, the rapid pace of change, and global competition have profoundly altered the ways adults work and live. Technology and globalization have transformed the workplace and increased the demand for more broadly skilled individuals. Unlike the past, when tasks in specific job sectors remained relatively constant over the working lives of most employees, employers now seek those who can keep pace with rapid changes in required knowledge and technologies. As a result, they seek individuals with the skills necessary to benefit from ongoing training programs and, more importantly, the ability and initiative to learn on their own and continuously upgrade what they know and can do. In addition to these changes in the way we work, everyday tasks increasingly require us to navigate, analyze, and problem solve using information that resides in complex digital environments. Increasingly, adults must use such information to make critical decisions impacting their health, financial security, and access to social services.

In an effort to develop a clearer picture of the roles that skills play in the lives of individuals and societies overall, the Organisation for Economic Co-operation and Development (OECD) undertook the largest survey of adult skills ever conducted as part of a program known as PIAAC (Programme for the International Assessment of Adult Competencies). Over the first cycle of PIAAC, there were three rounds of data collection involving over 30 countries. Unlike school-based surveys, which focus on specific ages or grades of in-school students, PIAAC was designed as a household study of nationally representative samples of adults ages 16-65 and was able to reflect the technology-based world in which we live and broaden what could be measured by being the first large-scale assessment administered on computers (OECD, 2013).

In their initial report based on analysis of the PIAAC data (*America's Skills Challenge*, 2015), the authors of the current paper focused on our nation's millennials, those who were 16-34 at the time of the first PIAAC assessment. Their analyses revealed that, despite having the highest levels of educational attainment of any previous American cohort, these young adults demonstrated relatively weak skills in literacy, numeracy, and problem solving in technology-rich environments compared to their international peers in PIAAC. These findings held true overall as well as when applied to our best performing adults (i.e., those in the 90th percentile), the native born, and those from the highest socioeconomic level measured by PIAAC.

In *Too Big to Fail: Millennials on the Margins*, Sands and Goodman return to the question of how skills are distributed across the millennial population, focusing on the size and demographic characteristics of U.S. millennials with low literacy and numeracy skills, and the resulting impact on social and economic outcomes. They do this in part by examining the issue of "disconnected youth," a term typically applied to those ages 16-24 who are not employed or engaged in formal education or training. Since the Great Recession of 2008, researchers have become increasingly concerned with these disconnected youth who, according to some estimates, represent approximately 6 million young adults in the United States. The focus of this research has been on their educational attainment and labor market participation. While helpful, this approach is limited in two ways. First, it focuses on only our youngest adults at a time when the transition to adulthood is more prolonged. Second, it is based on the premise that employment and/or more education are assured catalysts for entry into the middle class and improving life outcomes.

The authors question whether this assumption is appropriate to current circumstances; they suggest that looking at young adults only in terms of ties to the labor market or formal education may underestimate the scope of the challenges that we face and may skew our understanding of the policies needed to alter our course.

When skill measures are used to deepen our understanding of who is connected and disconnected in our society, the authors argue, a more accurate picture of our marginalized millennials emerges. Of a cohort of nearly 77 million, an estimated 36 million have low skills in literacy and 46 million in numeracy. The vast majority of these low skilled millennials were in fact connected to employment or education (31 million in literacy and 39 million in numeracy). These numbers are sobering because the findings presented in this report show that skills are associated with an array of important outcomes including employment opportunities, wages, and benefits. The author's findings also underscore that literacy and numeracy are not only connected with economic returns but play a critical role in uniting our society and democracy. For example, Sands and Goodman report that better skills are associated with increased levels of trust and civic engagement. Other research also supports that skills are associated with the likelihood of individuals participating in lifelong learning, keeping abreast of social and political events, voting in state and national elections, and trusting others. It also supports that literacy is likely to be one of the pathways linking education and health and may contribute to the disparities observed in the quality of health care that many receive.

If the disparities in skills and opportunities observed in the PIAAC data were confined to this generation alone, it would be concerning enough. But there is mounting evidence that the accumulation of advantage or disadvantage experienced by one generation will be passed to the next, making life outcomes increasingly dependent on circumstances of birth. As argued in *Choosing Our Future: A Story of Opportunity in America* (Kirsch, Braun, Lennon, & Sands, 2016) our economic and social well-being are deeply intertwined.

Sands and Goodman evoke the phrase "too big to fail" to suggest the interconnected nature of the challenges that low skills pose to individuals and our society as a whole. As they maintain, it is becoming increasingly clear that those whom we marginalize should not be thought of as "them" because they are, in fact, "us." If, as a nation, we do not find more effective ways to improve the skills and the lives of these young adults, we will likely continue to drift apart, placing an enormous strain on our nation's social fabric and the character of its democracy.

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Irwin Kirsch, Henry Braun, Mary Louise Lennon, and Anita Sands, *Choosing our Future: A Story of Opportunity in America* (Princeton, NJ: Educational Testing Service, 2016), <https://www.ets.org/s/research/report/opportunity/ets-choosing-our-future.pdf>.

The whole people must take upon themselves the education of the whole people and be willing to bear the expenses of it.

—John Adams, 1785

We believe that this country will not be a permanently good place for any of us to live in unless we make it a reasonably good place for all of us to live in ... [A]ll of us will pay in the future if we of the present do not do justice to all in the present.

—Theodore Roosevelt, 1912

Introduction

Broadly defined, education is a process of "imparting or acquiring general knowledge, developing the powers of reasoning and judgment, and generally of preparing oneself and others intellectually for a mature life."¹ Educating the whole people, both in and out of formal institutional settings, ultimately benefits the whole people, as John Adams implies. If this were happening today in America, there would be no need for discussion. But it is not. Tens of millions of America's young adults—*millennials*—are not adequately equipped to thrive in today's world in terms of their level of human capital. This has implications not only for these 16- to 34-year-olds, but for our society as a whole.

Many millennials are entering the labor market, continuing their education, becoming parents, and setting up individual households of their own—often for the first time. Yet when we look more closely at those along the path to adulthood, a more complex picture emerges. As researchers have documented, a concerning number of the youngest in this group are "disconnected," a term used to describe those who are 16-24 who are neither employed nor engaged in formal education.² Today in the United States, according to some estimates, nearly 6 million in that age bracket fall into the disconnected category.³ In this paper, we argue that disconnection defined entirely in relation to whether one is employed or enrolled in education underestimates the obstacles ahead. When we expand the definition of disconnection to one that includes the skill (or human capital) levels of our millennial generation, the problem becomes simply too big to ignore. Nearly half of America's estimated 77 million millennials—or around 36 million—are attempting the transition to adult roles with low literacy skills.⁴ More than half—46 million—are doing so with low numeracy skills.

The problem of low skills—particularly among a generation who will be the parents, workers, and citizens for many decades to come—will affect all of us. Human capital—and the varying opportunities to acquire and augment it—is a critical component of the larger condition of inequality we are observing in the United States today.⁵ This is in part because the quality of education, as well as the opportunity to learn throughout one's lifetime, is ever more closely tied to the accumulation of critical social capital (e.g., where one lives, one's social networks, and level of engagement in society) than either John Adams or Theodore Roosevelt would have envisioned it to be in the 21st century.⁶ When Roosevelt reminded Americans at the beginning of the last century—when inequality was at a similarly high level⁷—that the progress of our country rests in securing the well-being of all of us, he may well have been speaking to Americans today. We do well to contemplate that, as he warned, "[n]one of us can really prosper permanently if masses of our fellows are debased and degraded."⁸

Setting the context

How we got to this place is a complicated question. Policy decisions at all levels of government, not to mention globalization and technological advancements in the past three to four decades, have fostered an increasingly unequal distribution of skills. This has occurred at a time when higher skill levels are needed to enter the middle class and stay there and to fully participate in our increasingly complex society. As many have documented, the post-World War II American economy, built on an enlarging base of domestic manufacturing and consumption and bolstered by federal policies to open up education and housing opportunities for many, enabled the expansion of a broad middle class. American educational attainment surged past that of most other countries, and public investment in postsecondary education made college more accessible and affordable for increasing numbers of Americans.⁹ Through this period, the labor market, by and large, provided employment opportunities for a wide swath of the American population at levels generally sufficient to sustain a strong middle class, including the ability to acquire a home, invest in educational opportunities for children, and assure some security into old age. The provision of these benefits to some at the expense of others is an important element of this story, and much solid research has emerged to shape our understanding of how this prosperity was unevenly distributed by race and gender, further entrenching other forms of inequality.¹⁰ Nonetheless, it is fair to characterize the post-World War II period as one where skills attained in a U.S. high school and postsecondary education were largely matched by employment opportunities, with wages and benefits that made entry into the middle class possible for increasing numbers of American families.

Around 1970, the contours of this economic and social landscape began to shift. When the "blue collar" economy of the postwar period began to give way to the knowledge-based economy we have today, human capital took on increasing importance. This new economic reality emerged alongside advances in technology, globalization, and an array of corporate and governmental policies that weakened the power of organized labor and redirected funds away from public investments in families and communities.¹¹ The cumulative effect of these changes has increased inequality of opportunity, resulting in a concentration of wealth at top income levels and placing significant strain on America's lower and middle classes.¹² At the same time, other industrialized nations—both in Europe and Asia—increased not only their economic standing, but the development of human capital of their younger populations.

Take, for example, the Republic of Korea and Finland. In the past four decades, both countries focused political attention and economic resources on providing accessible, quality secondary and postsecondary educational options for their younger population. In one sense, they were playing catch-up to countries like the United States that had led in the post-World War II period in compulsory secondary education.¹³ Skills data from the Organisation for Economic Co-operation and Development's (OECD) Programme for International Assessment of Adult Competencies (PIAAC), 2012/2014,¹⁴ which compares the scores of millennials (ages 16-34) to older adults (35-65), demonstrate this. Millennials in Finland scored 25 points higher (on a 500-point scale) in literacy than adults over 35, and in the Republic of Korea, millennials scored 29 points higher. In the United States, on the other hand, the difference between these two age groups was just 9 points. But the PIAAC data highlight much more than this. Studies of the data show that while older U.S. adults outperformed their international counterparts in many OECD participating countries, the scores of U.S. millennials lagged behind those of many of their international peers.¹⁵ In other words, many industrialized nations have not only caught up to the United States in educational attainment, the skills of their young adults are surpassing those of U.S. millennials.¹⁶

The broad changes outlined above have had a profound impact on the role human capital plays in earnings levels that sustain a viable middle-class life. Labor economists have studied the dimensions of the new economy that have emerged over roughly the past four decades and demonstrated that the increasing "return to skills" (monetary gains expected from attaining higher levels of skills/education and training), coupled with a sharp and precipitous decline in the wage-earning potential of those with a high school education, has contributed to growing inequality on the one hand and increased the important role of human capital on the other. As economist David Autor perceptively suggests, this phenomenon is a double-edged sword. Investment in skills—particularly very high levels of skills—carries a payoff in the marketplace. But, Autor notes, "this trend also masks a discouraging truth: The rising *relative* earnings of college graduates are due not just to rising *real* earnings for college workers but also to falling real earnings for noncollege workers."¹⁷ Having limited opportunity to acquire and develop human capital, in other words, is more costly than it used to be.

In this report we first shift the emphasis of "disconnection" from a concern with attachments to employment and education to one that includes human capital, or skill level. Next, we use PIAAC skills data to provide a brief international context for the performance of U.S. millennials, followed by an in-depth analysis of the size and demographic dimensions of the problem of low skills in this cohort. Finally, we explore the relationship between skills and measures of social cohesion/social capital. In so doing, we argue that low skills are correlated to a larger sense of disconnection and disengagement from political and social life.

Expanding the Notion of Disconnection

Researchers have been focusing a great deal of attention on the growing population of disconnected youth in both Europe and the United States, especially since the 2008 Great Recession. *Measure of America* recently referred to the problem of youth disconnection from the labor market and education sphere as an "epidemic" and estimated that in the United States today, 5.8 million young adults are neither working nor in school.¹⁸ In 2015, the Congressional Research Service released a report claiming the figure to be roughly 6 percent of the total population of 16- to 24-year-olds.¹⁹ That same year, the OECD published a report examining rates of disconnected youth across member nations. It concluded that the size of this population made "improving the employment and social integration among youth a prime policy concern."²⁰

The underlying assumption of the current research on youth disconnection is clear: Those who are attached to formal education and/or the labor market have the skills and knowledge necessary for self-sufficiency, while those without such attachments are at risk of being left behind.²¹ The collective findings from this body of research are important and alarming, but perhaps they don't go far enough.

Our approach here purposefully casts a somewhat different net over the notion of "disconnection" by focusing on the role of cognitive skills in addition to formal links to the labor market or education. While the latter are undoubtedly important issues—employment and higher levels of educational attainment are clearly correlated to higher wages and better life outcomes²²—attending *solely* to these types of connections may not tell us the whole story. Research shows that having low skills limits individuals' ability to fully capitalize on opportunities in our knowledge-centered society.²³ Thus, if we define disconnection by the level of one's cognitive skills, we gain a more accurate picture of the challenges many young adults are facing as they transition to the next phase of their lives. Using the PIAAC data, we demonstrate that connection to education and employment are indeed necessary, but not sufficient: Our research indicates that approximately 31 million millennials who have ties to formal education (either in high school or some form of postsecondary education) or employment nonetheless have low literacy skills; 39 million have low numeracy skills. In addition to reconceptualizing how we understand and measure disconnection, we extend the population under consideration by adding 25- to 34-year-olds, as the millennial generation experiences a more prolonged transition into adulthood than previous generations of young adults and remains an important focus of research, policy, and media attention.²⁴

Looking at disconnection in terms of skill level also helps us more fully appreciate the social and economic costs of having low skills. These costs are far reaching, both for individuals—a fact we generally acknowledge—and for society more broadly. At the individual level, the role that human capital plays in one's well-being is generally understood to be clear-cut: High skills are correlated with better jobs, higher wages, and more favorable life outcomes.²⁵ Skills, though, are developed, formally and informally, through myriad *connections* across a lifetime—one's "social capital." The National Academy of Sciences defines social capital broadly as one's level of "political participation; engagement in community organizations; connectedness with friends and family and neighbors; and attitudes toward and relationships with neighbors, government, and groups unlike one's own." These connections matter because they are aligned with "positive outcomes in many areas of life, including health, altruism, education, employment, and child welfare, and compliance with the law."²⁶ Recent research suggests that individuals with greater levels of social capital are better positioned to both initially acquire and then maintain higher levels of human capital (skills) over a lifetime.²⁷

Individuals with higher levels of human and social capital also transmit advantages to their children in more or less tangible ways. For example, research in early education and child psychology documents that advantage is conferred even before the birth of a child in the form of better prenatal care.²⁸ Parents with greater resources and time are also more likely to read to their children, providing opportunity for the development of richer vocabularies that manifest in higher K-12 achievement scores. In addition, greater resources allow them to provide more access to enriching afterschool and other extracurricular opportunities for their children.²⁹ The human and social capital that amass during childhood then set the stage for a favorable transition to adulthood (e.g., better colleges and employment opportunities). Simply put, advantages tend to accumulate and compound over time. Conversely, a steep—and steepening—slope confronts those living in situations that do not foster the development of human and social capital. Those living in challenging environments or in communities with high rates of crime, poverty, unemployment, or poor health tend to start at a deficit, as do their offspring. Writ large, the dynamics of what can be termed "accumulated advantage and disadvantage," and the inequality that results, is polarizing America—such that increasingly, we simply don't see each other.³⁰ As Robert Putnam, author of *Our Kids: The American Dream in Crisis*, argues, inequality—and the social segregation it has created and perpetuated—has fostered an environment of polarization where, "[w]e just don't know how the other half lives." This growing divide, according to Putnam, "constrains our sense of reciprocity. It constrains our sense of what we owe to one another. We are less and less a community."³¹

The Millennial Generation

Often referred to as *millennials*, but also known as *Gen Y* or *echo boomers*, this group of 16- to 34- year-olds is generally understood as those born between 1980 and 2000. These individuals are, by and large, the offspring of the postwar baby-boom generation (1946-1964) and older Gen Xers (1965-1980); others are young immigrants to the United States. In total, millennials number around 77 million, or nearly a quarter of the U.S. population, and their significance can hardly be overstated: They are the largest living generation of Americans and represent a sizable portion of the current and future labor force.³² It is probably not an exaggeration to say that, as millennials go, so goes America.

Our previous report, *America's Skills Challenge: Millennials and the Future* (2015), had a decidedly international focus and explored the skills of U.S. millennials in comparison to 21 other OECD countries that participated in PIAAC.³³ PIAAC was designed to assess and compare the key cognitive and workplace skills of adults (age 16-65) needed for successful participation in twenty-first century society and a globalized economy. As of its latest reported administration (Round 2, 2012-2016), the survey measured the skills of adults across 33 countries in three domains: literacy, numeracy, and problem solving in technology rich environments.³⁴ In addition to the cognitive data captured, the OECD collected a wealth of background information that can be linked to skills performance.³⁵

America's Skill Challenge reported that despite having the highest levels of educational attainment in American history, U.S. millennials were, by and large, outperformed by their peers in other OECD countries across the three domains. This finding was especially true for numeracy. When we looked at various subpopulations of millennials—native born, those with different levels of educational attainment, those at the highest and lowest levels of performance, and those with different socioeconomic backgrounds—U.S. millennials were generally outperformed by their peers in many of the PIAAC participating countries. This current report again relies on data from PIAAC and provides a focused examination of the size and dimensions of the U.S. young adult population in terms of skill levels in literacy and numeracy, and characteristics associated with these levels.³⁶

Understanding PIAAC

As stated, the purpose of PIAAC is to measure the key cognitive and workplace skills needed for individuals to participate in society and for economies to prosper. Real-world tasks in literacy and numeracy probed respondents' ability to distinguish between relevant and irrelevant information; correctly fill out online insurance forms; integrate, synthesize, and interpret arguments offered in various forms of media; understand employment requirements; and calculate the costs and benefits of retirement plans, to name a few.³⁷ In other words, PIAAC, as a household assessment of adults and young adults—unlike other international and national assessments of in-school populations (e.g., the Progress in International Reading Literacy Study [PIRLS], the Programme for International Student Assessment [PISA], Trends in International Mathematics and Science Study [TIMSS], and the National Assessment of Educational Progress [NAEP])—is designed to gauge functional skills required for living a mature and independent adult life. These more broadly defined skills often clearly intersect with those that are foundational and useful for gainful employment, yet we also need to recognize that they are essential for individuals to traverse the complex systems present in our everyday lives.³⁸

Moreover, in a period when there is increased attention paid to our ability to critically evaluate the unprecedented amounts of information encountered daily, these skills have never been more crucial to having an informed and engaged citizenry.³⁹

Throughout this report we will be discussing both the average score of millennials and the percentage of millennials who perform at select proficiency levels on the PIAAC literacy and numeracy assessments.⁴⁰ Proficiency levels on PIAAC range from a low of below Level 1 to a high of Level 5. This report will look primarily at the percentage of millennials performing at the lowest levels (at or below Level 1 and those at Level 2) compared to those performing at or above Level 3. According to the OECD, Level 3 represents a "minimum" standard in both the literacy and numeracy domains.⁴¹ Exhibit 1 provides additional information on PIAAC proficiency levels by domain; for a full description of all proficiency levels and sample questions, see Appendix B.

The results presented here were obtained using the International Association for the Evaluation of Educational Achievement's IDB Analyzer, which creates SPSS or SAS syntax that takes into account the sample and assessment design in the computation of results.⁴² Differences (either between countries or specific groups of adults within the United States) in this report are noted in the text only if they are determined to be statistically significant ($p < .05$). No statistical adjustments to account for multiple comparisons were used.⁴³

Exhibit 1

LITERACY SKILLS

At or below Level 1	<ul style="list-style-type: none">• Likely can read very brief texts on familiar topics to locate a single piece of information, using basic vocabulary• Have difficulty cycling through or integrating two or more pieces of information contained in a text• Have difficulty navigating within digital texts to access and identify information from various parts of a document
At Level 2	<ul style="list-style-type: none">• Likely are capable of identifying simple paraphrasing or making low-level inferences• Struggle to understand lengthy texts (multiple pages), navigate more complex online digital documents, or evaluate one or more pieces of information• Struggle to compare, contrast, or reason about information provided
At or above Level 3	<ul style="list-style-type: none">• Likely can navigate and understand texts that are multiple pages or are in a complex digital format• Likely can identify, interpret, or evaluate one or more pieces of information that may require varying levels of inference• Likely can perform tasks that require respondent to construct meaning across large chunks of texts or perform multi-step operations• Likely are able to read and disregard information that is irrelevant to answer questions correctly

NUMERACY SKILLS

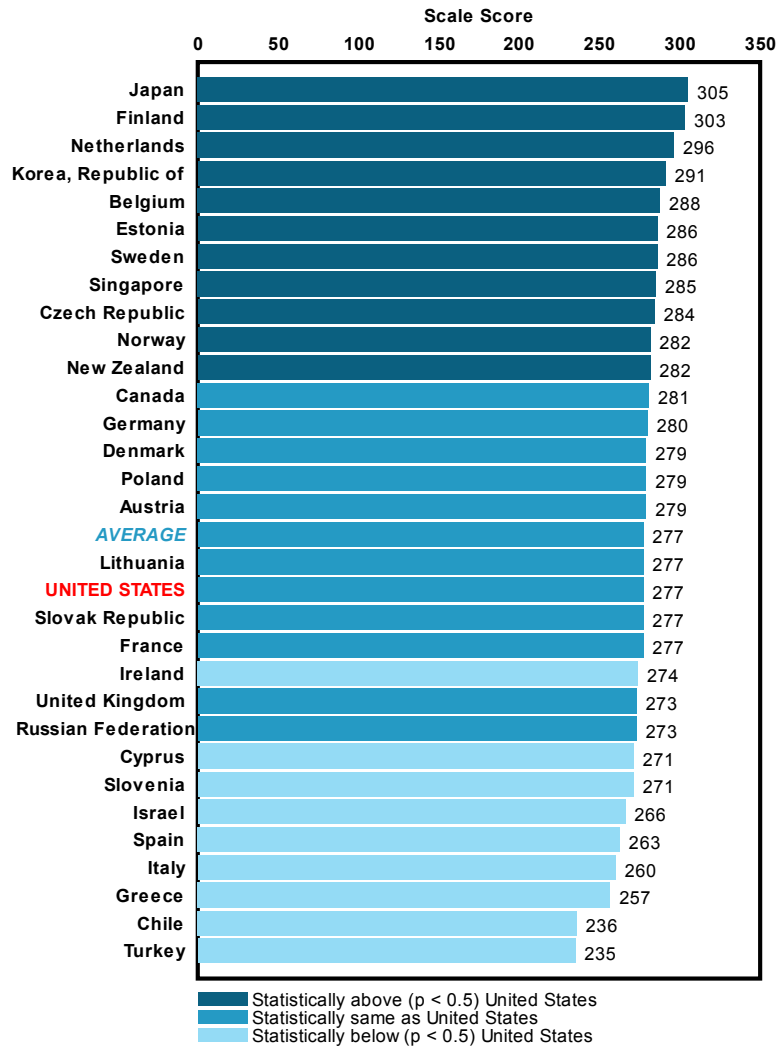
At or below Level 1	<ul style="list-style-type: none">• Likely can carry out simple operations: counting, sorting, performing basic arithmetic with whole numbers or money• Likely can recognize common spatial representation in concrete, familiar contexts where mathematic context is explicit with little or accompanying text or distractors• Likely struggle to perform tasks that require two or more steps involving calculation with whole numbers and common decimals, percents, fractions, simple measurement and spatial representation
At Level 2	<ul style="list-style-type: none">• Likely can interpret simple data and statistics in texts, tables or graphs.• Likely struggle to recognize and work with mathematic relationships, patterns, and proportions expressed in text or numerical form• Likely struggle to interpret and perform basic analysis of data and statistics in texts, tables and graphs
At or above Level 3	<ul style="list-style-type: none">• Likely can identify and act on mathematical information and ideas embedded in a range of common contexts• Likely can perform tasks that require several steps and the choice to use problem-solving strategies and related processes• Likely can recognize and work with mathematic relationships, patterns, and proportions expressed in text or numerical form• Likely can interpret and perform basic analysis of data and statistics in texts, tables and graphs

Low-Skilled U.S. Millennials

Using data from the latest round of PIAAC, the relative performance of U.S. millennials compared to their international peers in 30 countries was at best mediocre. In literacy, U.S. millennials scored higher than their peers in 9 countries, lower than those in 11 countries, and on par with the PIAAC average. In numeracy, the results were more troubling. On average, U.S. millennials outperformed only 4 countries (Spain, Greece, Turkey, and Chile) and were below the PIAAC average (Figure 1).

Figure 1: Average scores on PIAAC literacy and numeracy scales for millennials by participating country/region: 2012/2014

LITERACY

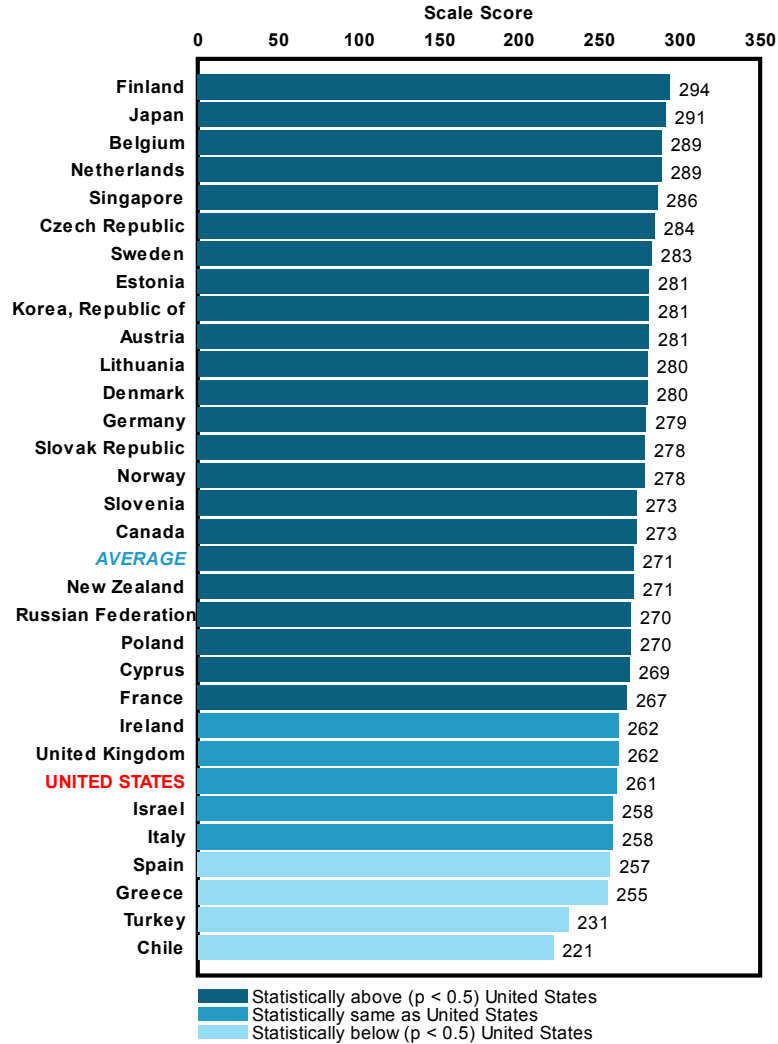


Note: See Appendix Table A-1 for standard errors.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Figure 1: Average scores on PIAAC literacy and numeracy scales for millennials by participating country/region: 2012/2014, (continued)

NUMERACY



Note: See Appendix Table A-1 for standard errors.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Mean scores are one way to understand the performance of a nation's millennial cohort, but they hide important details about the distribution of performance within countries. Of course, all countries have some percentage of their population at the lowest skill levels, but the range and distribution of performance across the PIAAC participating countries was noteworthy. Consider that in literacy, the percentage range of low-skilled millennials spanned from 2 percent at or below Level 1 in Japan to a high of 41 percent in Chile, with the United States falling toward the middle at 14 percent (Table 1). In numeracy, the range of performance at or below Level 1 spanned from a low of 7 percent (again, Japan) to a high of 53 percent in Chile, with the United States at 25 percent. Twelve nations had a smaller percentage of millennials at or below Level 1 in literacy; in numeracy, 23 countries showed smaller percentages. In numeracy, only Turkey and Chile had larger percentages of their millennial population at or below Level 1. A similar pattern was evident across Level 2: U.S. millennials fell in the middle of

the distribution in literacy, and in numeracy, only Ireland, Greece, and Spain had greater percentages of their population at this level.⁴⁴

Also of note was the ranking in the percentage of higher-skilled U.S. millennials (those performing at or above Level 3) compared to their similarly skilled international peers. Percentages ranged from a high of 81 percent (Japan) to a low of 15 percent (Turkey) in literacy, and a high of 68 percent (Finland) to a low of 16 percent (Chile) in numeracy. Here again, the U.S. ranking was solidly in the middle in literacy (with 53 percent) and relatively poor in numeracy (40 percent), with just 4 nations having *lower* percentages of their millennial population performing at or above Level 3: Spain, Greece, Turkey, and Chile.

Table 1: Percentage of millennials performing at select proficiency levels on PIAAC literacy and numeracy scales, by participating country/region: 2012/2014

LITERACY

At or Below Level 1 (sorted - ascending on %)		At Level 2 (sorted - ascending on %)		At or Above Level 3 (sorted - descending on %)	
Japan	2*	Japan	17*	Japan	81*
Korea, Republic of	4*	Finland	18*	Finland	77*
Finland	5*	Netherlands	22*	Netherlands	72*
Netherlands	7*	Sweden	25*	Korea, Republic of	70*
Czech Republic	8*	Belgium	25*	Belgium	66*
Estonia	9*	Korea, Republic of	26*	Sweden	65*
Belgium	9*	Norway	27*	Estonia	63*
Lithuania	9*	Singapore	28*	Singapore	62*
Singapore	10*	Estonia	29*	Czech Republic	61*
Sweden	10*	Germany	29*	Norway	61*
Slovak Republic	11*	Denmark	31	New Zealand	58*
New Zealand	11*	Czech Republic	31	Denmark	58*
Austria	11	Canada	31	Germany	58*
Denmark	12	New Zealand	31	Austria	57*
Poland	12	Austria	32	Canada	57*
Norway	12	<i>Average</i>	32	Slovak Republic	56
Canada	12	France	33	Poland	55
Ireland	13	Poland	33	France	54
Cyprus	13	United Kingdom	33	<i>Average</i>	54
France	13	Slovak Republic	33	Lithuania	53
Germany	13	United States	34	United States	53
United States	14	Israel	34	United Kingdom	51
<i>Average</i>	14	Slovenia	35	Russian Federation	50
Russian Federation	14	Russian Federation	36	Ireland	50
Slovenia	15	Lithuania	37	Slovenia	50
United Kingdom	16	Ireland	38*	Cyprus	48*
Spain	19*	Chile	38*	Israel	45*
Israel	21*	Italy	39*	Spain	41*
Italy	21*	Cyprus	39*	Italy	40*
Greece	24*	Spain	40*	Greece	34*
Turkey	38*	Greece	41*	Chile	21*
Chile	41*	Turkey	46*	Turkey	15*

*Statistically different ($p < .05$) from United States

See Appendix Table A-2 for standard errors.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Table 1: Percentage of millennials performing at select proficiency levels on PIAAC literacy and numeracy scales, by participating country/region: 2012/2014 (continued)

NUMERACY

At or Below Level 1 (sorted - ascending on %)		At Level 2 (sorted - ascending on %)		At or Above Level 3 (sorted - descending on %)	
Japan	7*	Finland	24*	Finland	68*
Korea, Republic of	8*	Singapore	25*	Japan	67*
Finland	8*	Belgium	26*	Belgium	65*
Belgium	9*	Netherlands	27*	Netherlands	64*
Netherlands	9*	Japan	27*	Singapore	63*
Czech Republic	10*	Sweden	27*	Sweden	60*
Estonia	11*	Norway	28*	Czech Republic	60*
Lithuania	11*	Germany	29*	Austria	58*
Singapore	12*	Austria	30*	Korea, Republic of	58*
Austria	12*	Slovak Republic	30*	Norway	57*
Sweden	12*	Denmark	30*	Estonia	57*
Slovak Republic	13*	Czech Republic	30*	Slovak Republic	57*
Denmark	13*	Canada	31*	Denmark	57*
Russian Federation	15*	Chile	32	Germany	56*
Norway	15*	New Zealand	32	Lithuania	56*
Germany	15*	Estonia	32	Slovenia	51*
Slovenia	16*	Israel	32	Canada	50*
Cyprus	16*	<i>Average</i>	32	<i>Average</i>	50*
Poland	17*	Slovenia	32	New Zealand	49*
<i>Average</i>	18*	Lithuania	33	Russian Federation	47*
Canada	18*	United Kingdom	34	Poland	47*
New Zealand	19*	France	34	Cyprus	46*
France	20*	United States	35	France	46*
Ireland	21*	Korea, Republic of	35	United Kingdom	42
Spain	22	Poland	36	Israel	41
United Kingdom	24	Italy	37	Ireland	41
Italy	25	Russian Federation	37	United States	40
United States	25	Cyprus	38	Italy	37
Greece	27	Turkey	39	Spain	35*
Israel	27	Ireland	39*	Greece	33*
Turkey	43*	Greece	40*	Turkey	18*
Chile	53*	Spain	43*	Chile	16*

*Statistically different ($p < .05$) from United States

See Appendix Table A-2 for standard errors.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Table 2 shows in more detail the performance of U.S. millennials across select proficiency levels (at or below Level 1, Level 2, and at or above Level 3). Fourteen percent of the millennial population, or approximately 10.4 million, performed at or below Level 1 in literacy. In numeracy, a quarter of all millennials—approximately 19.4 million—performed at this skill level. When we add the millennial population that scored at Level 2, the totals increased dramatically. An estimated 36.2 million millennials (47 percent) performed at or below Level 2 in literacy and an estimated 46.1 million (60 percent) performed at or below Level 2 in numeracy.

Table 2: Estimated number and percentage of millennials performing at select proficiency levels on PIAAC literacy and numeracy scales: 2012/2014

	Total Millennial Population	Proficiency Level					
		At or Below Level 1		Level 2		At or Above Level 3*	
		Estimate (millions)	%	Estimate (millions)	%	Estimate (millions)	%
LITERACY	76.7	10.4	14	25.8	34	40.5	53
NUMERACY	76.7	19.4	25	26.7	35	30.7	40

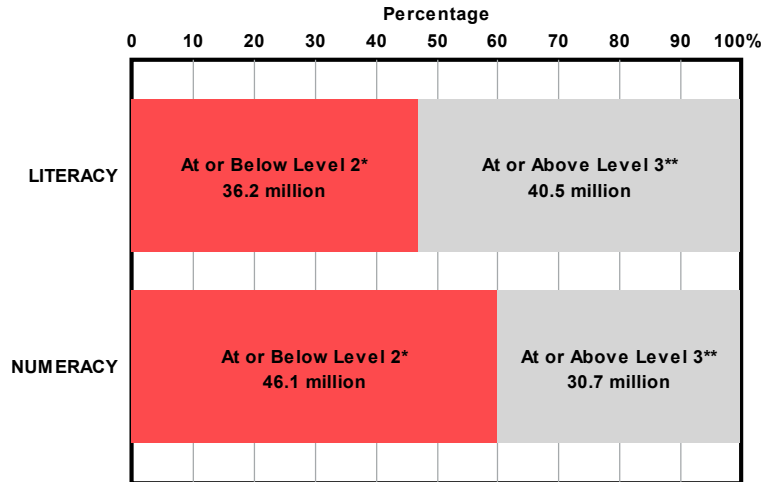
*At or Above Level 3 = Levels 3, 4, & 5

Note: Totals are based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Of course, of the roughly 76.7 million U.S. millennials, some are faring well in today's economy and society. Given what is known about the association of skills and life outcomes, those with higher skills (at or above Level 3) are more likely to transition smoothly into adulthood.⁴⁵ For this group, there is likely a marked forward progression toward achieving a sustainable life for themselves and their children. Yet, for many others with lower skills, the future may be less secure. In fact, in literacy, there were nearly as many millennials who performed at or below Level 2 as there were at or above Level 3 (Figure 2). In numeracy, there were actually *more* millennials (approximately 15 million more) who performed at or below Level 2 than at or above Level 3.

Figure 2: Estimated percentage and number of millennials performing at select proficiency levels on PIAAC literacy and numeracy scales: 2012/2014



*At or Below Level 2 = At or Below Level 1, and Level 2

**At or Above Level 3 = Levels 3, 4, & 5

Note: Totals based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Having a large number of young adults performing at or below Level 2, combined with the relatively poor performance of U.S. millennials compared to their international peers, is concerning. Within the boundaries of the United States, low skill levels impact individuals' lives across a range of issues, from the obvious ones of employment and education, to the perhaps less obvious but no less important concerns of levels of trust and engagement with society. How will these human and social capital outcomes, when amplified by millions, affect the larger society? From a global perspective, the mediocre skill level of U.S. adults in literacy and the poor performance overall in numeracy invites the question of how the United States can compete internationally when so many are saddled with low skills. Moreover, taking the long view, we need to consider what opportunities are lost when so many young Americans are relegated to the margins of society.

Who Are Our Low-Skilled Millennials?

U.S. millennials have been labeled "the most ethnically diverse adult cohort in American history" and are projected to be the parents of an even more heterogeneous population over the coming decades.⁴⁶ In *Diversity Explosion: How New Racial Demographics Are Remaking America* (2014), demographer William Frey chronicles how vital it is for us to take full notice of demographic trends affecting the millennial cohort. "It is critical to ask how well poised this increasingly younger, diverse population is—and will be—to sustain themselves and their communities," Frey warns. "They've got to be well trained. They've got to be ready to move into those high-tech jobs, the middle class jobs, or at least be able to support themselves and to support their communities."⁴⁷ Despite the fears that the changing demographics at times spark in the short run, Frey argues, "investments in younger minorities—whom [some] may not yet see as their children and grandchildren—are crucial not only to the success of the nation's economy but also to future contributions to government programs like Social Security and Medicare."⁴⁸ In essence, then, the more we realize that the gaps in skills reflected both between and among groups are part of a larger problem of the *whole* people, the better off we will be.

Below we provide descriptive statistics from PIAAC for millennials by gender, race/ethnicity, and nativity/language status across the levels of proficiency discussed above. These data raise two related and important concerns. They reflect achievement gaps (particularly racial/ethnic gaps) that we—and many others—believe may ultimately stem from inequality in access to opportunity throughout the country.⁴⁹ At the same time, in terms of absolute numbers, the problem of low skills among our millennial population is pervasive, with implications for all of us.

Gender

Overall, there is a slightly larger percentage of males than females in the millennial population (Table 3). The small difference in the average PIAAC literacy scores of millennial men (276) and women (278) was not statistically different. The relative parity of literacy scores for young adult men and women is in contrast to national and international assessments of school-age children that show a gender achievement gap in favor of girls.⁵⁰ In PIAAC numeracy, however, male millennials scored higher than their female counterparts; also, a larger percentage of young adult women compared to men performed at or below Level 1 and at Level 2, and a smaller percentage performed at or above Level 3. This difference in performance between men and women in numeracy is mirrored in the performance of U.S. 15-year-olds internationally and 12th graders nationwide.⁵¹

The gender gap we observe in numeracy is likely correlated to structural and curricular issues in education, choice of major, occupational choices, and even work-related skill use, all of which warrant additional research.⁵²

Table 3: Percentage distribution, average scores, and estimated number and percentage performing at select proficiency levels on PIAAC literacy and numeracy scales for millennials, by gender: 2012/2014

	Total Millennial Population		Avg. Scale Score	Proficiency Level					
				At or Below Level 1		At Level 2		At or Above Level 3	
	Estimate (millions)	%		Estimate (millions)	%	Estimate (millions)	%	Estimate (millions)	%
LITERACY									
Female	37.6	49	278	4.4	12*	13.1	35	20.1	53
Male	39.1	51	276	6	15	12.7	32	20.4	52
NUMERACY									
Female	37.6	49	255*	10.4	28*	14	37*	13.2	35*
Male	39.1	51	267	9	23	12.6	32	17.5	45

*Statistically different ($p < .05$) from "male"

Note: Totals are based on the sum of the unrounded numbers

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Race/ethnicity

PIAAC data show that 59 percent of millennial respondents identified as White, 19 percent as Hispanic, 14 percent as Black, and 8 percent as Other race.⁵³ Table 4 shows that Black millennials were approximately three times as likely as White millennials to perform at or below Level 1 in literacy, and Hispanic millennials were nearly four times as likely to do so. The 3-percentage-point difference between Blacks and Hispanics who performed at or below Level 1 in literacy was not statistically significant. At Level 2 in literacy, there was again no statistically significant difference in the performance of Blacks and Hispanics (46 and 40 percent, respectively), while White and Other race millennials had smaller percentages than both Blacks and Hispanics at this level. In numeracy, the pattern of performance between racial/ethnic groups differed somewhat. Although larger percentages of Whites and Other race millennials performed at or above Level 3 (52 and 47 percent, respectively) compared to Black and Hispanic millennials (and a smaller percentage at or below Level 1), there was no difference in the percentage between any of the racial/ethnic groups that performed at Level 2.

Table 4: Percentage distribution, average scores, and estimated number and percentage performing at select proficiency levels on PIAAC literacy and numeracy scales for millennials, by race and ethnicity: 2012/2014

	Total Millennial Population		Avg. Scale Score	Proficiency Level					
				At or Below Level 1		At Level 2		At or Above Level 3	
	Estimate (millions)	%		Estimate (millions)	%	Estimate (millions)	%	Estimate (millions)	%
LITERACY									
White	45	59	290	3	7	13	29	29	64
Black	10.6	14	254	2.6	24	4.9	46	3.1	29
Hispanic	14.5	19	253	3.9	27	5.8	40	4.8	33
Other race	6.3	8	281	0.8	13	1.9	31	3.6	56
NUMERACY									
White	45	59	277	6.5	14	15.3	34	23.2	52
Black	10.6	14	224	5.5	52	3.7	35	1.3	13
Hispanic	14.5	19	235	6.1	42	5.3	37	3.1	21
Other race	6.3	8	268	1.2	19	2.1	34	3	47

Note: Totals are based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

The magnitude of the racial/ethnic gaps that we observe in the PIAAC data is deeply troubling. Studies indicate that the United States is increasingly segregated by income and has long been segregated by race/ethnicity, and that these overlapping structural realities likely play a critical role in both producing and perpetuating the achievement gaps observed across racial/ethnic groups and income groups at the K-12 level.⁵⁴ These same inequalities may account for much of the skills gap seen in the PIAAC data. That these gaps are evident in the skills data of the young adult population should not in and of itself be surprising. What this communicates about inequality now and in the future, however, is of great concern.

Putting aside for a moment the underlying factors that perpetuate large racial/ethnic disparities in achievement in national and international assessments, the PIAAC data on young adult skills reveals that, in numerical terms, the problem of inadequate skills cuts across particular racial/ethnic groups.⁵⁵ Over 16 million White millennials scored at or below Level 1 or at Level 2 in literacy, and almost 22 million did so in numeracy.

Nativity status and language

In order to account for the intersection of nativity status and language, our measure here uses a combined variable of native-born *or* native-language vs. foreign-born *and* foreign-language. This allows us to distinguish between those millennials for whom English is a first language and those for whom it is not. For the remainder of the report we will refer to the native-born or native-language as *native-language* and the foreign born and foreign language as *foreign-language*.

The growing heterogeneity of the U.S. young adult population is part of a global phenomenon that is touching a number of other countries, particularly many OECD countries. Though the United States has the largest *absolute* number of immigrants, foreign-language millennials make up only 9 percent of its overall millennial population. This is less than the percentage of foreign-language millennials in a number of other OECD countries, including, for example, Austria (13 percent), Canada (15 percent), Germany (11 percent), Norway (14 percent), and Sweden (15 percent) (Appendix Table A-4). Comparing the skills of native-language millennials

to their counterparts in a subset of other countries with similar percentages of foreign-language millennials reveals several key points.⁵⁶ First, in literacy, U.S. millennials who are native-language speakers scored higher on average than their native-language counterparts in only three countries (Ireland, Spain, and Italy). Second, in numeracy, U.S. native-language speakers scored higher on average than their counterparts in only one country—Spain. Third, foreign-language millennials in the United States scored higher on average than their foreign-language millennials in three countries (Sweden, Spain, and Italy) in literacy and in two countries (Spain and France) in numeracy (Appendix Table A-5).

Across our subset of countries, native-language millennials scored higher on average than their foreign-language peers in both literacy and numeracy, and a smaller percentage of native language millennials performed at the lowest proficiency levels (Appendix Table A-6). This is largely an expected outcome given that PIAAC is administered across OECD countries in the native language of the host country. Comparative analyses have found that the gap between foreign- and native-language adults observed across all countries is related to country of origin, levels of educational attainment, age at immigration, and access to/experience with schooling in host countries.⁵⁷ Over and above the issue of gaps in the performance of native language vs. foreign language, the number of U.S. native-language millennials in the low-skilled group is noticeably high. In literacy, nearly 8 million performed at or below Level 1, with an additional 23 million performing at Level 2. In numeracy, once again, these numbers are even larger. Nearly 16.4 million native-language millennials performed at or below Level 1, with an additional 24.4 million performing at Level 2 (Table 5).

Table 5: Percentage distribution, average scores, and estimated number and percentage performing at select proficiency levels on PIAAC literacy and numeracy scales for millennials, by nativity and language status: 2012/2014

	Total Millennial Population		Avg. Scale Score	Proficiency Level					
				At or Below Level 1		At Level 2		At or Above Level 3	
	Estimate (millions)	%		Estimate (millions)	%	Estimate (millions)	%	Estimate (millions)	%
LITERACY									
Either native-born or native-language	69.6	91	281	7.8	11	23.4	34	38.3	55
Foreign-born and foreign-language	6.9	9	245*	2.5	37*	2.2	32	2.1	31*
NUMERACY									
Either native-born or native-language	69.6	91	263	16.4	24	24.4	35	28.7	41
Foreign-born and foreign-language	6.9	9	236*	3	43*	2	30	1.9	28*

*Statistically different ($p < .05$) from "native born or native language"

Note: Totals are based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

We now turn from an examination of the demographic dimension of U.S. millennials and its relationship to skills to an investigation of how employment and participation in educational activities relate to skill levels.

Millennials in Transition

Broadly speaking, millennials are in a stage of transition in terms of their roles as they move toward and through adulthood; many are proceeding with their educational goals, entering the labor market, establishing their first homes, and creating families of their own. Demographic research has examined that the transition to adulthood for this cohort often lasts well beyond age 25.⁵⁸ In fact, there is growing consensus among demographers that since the 1980s, America has witnessed a "lingering" pattern of transition to adulthood in contrast to a more rapid transitional phase in the middle of the twentieth century. In the postwar period (roughly 1945 to late 1970s), economic, political, and social forces converged to allow more U.S. adults, though certainly not all, to attain gainful employment upon exiting educational institutions (often high school), marry at younger ages, and set up independent households. For a time, demographers saw this as a new norm, differentiated from a late nineteenth-to-early-twentieth-century pattern where young adults transitioned to independence more slowly (e.g., marrying and setting up individual households later). When viewed through a wider lens, however, this shorter transitional phase for mid-century young adults now appears more aberrant than norm. Millennials are, as a group, delaying the end of school and the establishment of households with a partner.⁵⁹

Clearly, then, it is useful to consider whether and how employment and student status (enrolled in formal education or not) affect skill levels of this cohort. Across both literacy and numeracy, millennials who were simultaneously employed full time *and* engaged in formal educational activities had the highest percentage that performed at or above Level 3 and the lowest percentage at or below Level 1 or at Level 2 (Table 6). These are, in essence, the doubly engaged millennials. At the other end of the spectrum, millennials who were unemployed and not enrolled in education had nearly twice the percentage (26 percent in literacy and 47 percent in numeracy) at or below Level 1 compared to millennials overall (14 percent in literacy and 25 percent in numeracy). These data largely corroborate the findings in the "disconnected" literature alluded to previously. By and large, those without ties to the labor market and education represent some of our most vulnerable young adults and are at greater risk of experiencing negative life outcomes.⁶⁰

Table 6: Percentage of millennials at select proficiency levels on PIAAC literacy and numeracy scales, by employment and educational status

LITERACY

	At or Below Level 1	At Level 2	At or Above Level 3	Total
Total	14	34	53	100
Employment Status				
Employed full-time (35+ hours/week)	12	30	58	100
Employed 1-35 hours	12	35	53	100
Out of the labor force	15	37	48	100
Unemployed	22	41	37	100
Employment and Education Status				
<i>In Education</i>				
Employed full-time (35+ hours/week)	7	27	66	100
Employed 1-35 hours	9	34	57	100
Out of the labor force	13	36	52	100
Unemployed	17	39	44	100
<i>Not In Education</i>				
Employed full-time (35+ hours/week)	13	31	56	100
Employed 1-35 hours	16	37	47	100
Out of the labor force	20	38	42	100
Unemployed	26	43	31	100

NUMERACY

	At or Below Level 1	At Level 2	At or Above Level 3	Total
Total	25	35	40	100
Employment Status				
Employed full-time (35+ hours/week)	20	33	47	100
Employed 1-35 hours	24	37	38	100
Out of the labor force	32	34	34	100
Unemployed	41	37	22	100
Employment and Education Status				
<i>In Education</i>				
Employed full-time (35+ hours/week)	15	32	53	100
Employed 1-35 hours	19	37	44	100
Out of the labor force	29	33	38	100
Unemployed	35	40	25	100
<i>Not In Education</i>				
Employed full-time (35+ hours/week)	21	33	45	100
Employed 1-35 hours	31	38	31	100
Out of the labor force	36	36	28	100
Unemployed	47	35	18	100

Note: See Appendix Table A-3 for detailed data and standard errors.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Nonetheless, the PIAAC data highlight that employment in no way guarantees skills. Nor, seemingly, do some avenues of formal secondary and postsecondary education. Tables 7 and 8 allow us to take a slightly different view of the data and bring the issue of connection—to both education and employment—and its relationship to skills into sharper focus. In these tables, the percentages are computed on the total number *at each skill level*, rather than across a category of employment/education, as in Table 6. When we do this, we observe that of the estimated 10.4 million millennials who performed at or below Level 1 in literacy, 30 percent—or approximately 3.1 million—were enrolled in formal education/certificate programs. In numeracy, an estimated 19.4 million millennials performed at or below Level 1; an estimated 35 percent of them, or 6.9 million, were enrolled in education at the time of the PIAAC survey.

Table 7: Estimated number and percentage of millennials by performance at select proficiency levels on PIAAC literacy and numeracy scales, by current education status: 2012/2014

	Total Millennial Population	Enrolled in Education		Not Enrolled in Education	
	Estimate (millions)	Estimate (millions)	%	Estimate (millions)	%
LITERACY					
At or Below Level 1	10.4	3.1	30*	7.2	70*
At Level 2	25.7	10.0	39	15.7	61
At or Above Level 3	40.5	16.5	41	24.0	59
NUMERACY					
At or Below Level 1	19.4	6.9	35*	12.5	65*
At Level 2	26.6	10.4	39	16.2	61
At or Above Level 3	30.7	12.4	41	18.2	59

*Statistically different ($p < .05$) from "At or Above Level 3"

Note: Totals are based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

To gain a deeper understanding of the relationship of skills—and low skills in particular—to education, we examined millennials currently enrolled in education by their highest level of educational attainment (Table 8). Of the approximately 3 million low-scoring U.S. millennials in literacy who were enrolled in education, nearly two-thirds (62 percent) had less than a high school degree. In numeracy, of the approximately 7 million low-scoring millennials in numeracy who were enrolled in formal education, 56 percent had less than a high school degree. Even though more than half of these millennials were high school students or currently obtaining a high school equivalency at the time of the PIAAC, performing at or below Level 1 at this stage should be a cause for real concern.⁶¹ With skills at such low levels, these individuals will likely face substantial obstacles to successfully completing a two- or four-year postsecondary degree or advancing in the labor market.⁶²

Equally striking, however, is that 34 percent of those who performed at or below Level 1 in literacy, and 37 percent of this group in numeracy, were in fact enrolled in formal education *and* had obtained a high school degree/some college education (nondegreeed). In addition, of the millennials who scored at Level 2, 42 percent in literacy and 46 percent in numeracy were enrolled in formal education and had obtained a high school degree/some college (nondegreeed).

Table 8: Estimated number and percentage of millennials by current education status and performance at select proficiency levels on PIAAC literacy and numeracy scales, by educational attainment: 2012/2014

	Less than High School Diploma		High School Diploma/Some College but No Degree		College Degree or Higher (Associate, Bachelor, Doctorate)		Total	
	Estimate	%	Estimate	%	Estimate	%	Estimate	%
Enrolled in Education								
LITERACY								
At or Below Level 1	1,900,000	62*	1,100,000	34*	100,000	5*	3,100,000	100
At Level 2	4,300,000	43*	4,200,000	42	1,400,000	14*	10,000,000	100
At or Above Level 3	3,300,000	20	8,000,000	48	5,200,000	31	16,500,000	100
NUMERACY								
At or Below Level 1	3,800,000	56*	2,500,000	37*	500,000	7*	6,900,000	100
At Level 2	3,700,000	36*	4,700,000	46*	2,000,000	19*	10,400,000	100
At or Above Level 3	2,100,000	17	6,000,000	49	4,300,000	35	12,400,000	100
Not Enrolled in Education								
LITERACY								
At or Below Level 1	2,600,000	36*	4,200,000	58*	500,000	6*	7,200,000	100
At Level 2	2,100,000	13*	10,500,000	67*	3,100,000	20*	15,700,000	100
At or Above Level 3	900,000	4	9,800,000	41	13,300,000	55	24,000,000	100
NUMERACY								
At or Below Level 1	3,500,000	28*	7,800,000	63*	1,100,000	9*	12,500,000	100
At Level 2	1,500,000	9*	10,300,000	64*	4,300,000	27*	16,200,000	100
At or Above Level 3	500,000	3	6,400,000	35	11,400,000	62	18,200,000	100

*Statistically different ($p < .05$) from "At or above Level 3"

Note: Totals are based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

The PIAAC data here dovetail with a surge of scholarly work on important differences in the types and quality of formal education/certificate programs offered to millennials and underscore that in a country as large and diverse as the United States, postsecondary education is "far from a standardized product."⁶³ Further, these findings support a robust literature that examines equity concerns regarding higher education. Recent scholarship has documented that many who begin college and do not finish, as well as many who attend unregulated for-profit institutions, often start and end at a distinct disadvantage. In a number of key ways, the complex interaction of racial/ethnic and income disparities are likely at play here.⁶⁴ For example, on average Black and low-income students borrow more—and more often—than White and higher-income students to pay for their bachelor's degree, even at public institutions. In addition, Black and lower income students borrowing for associate level and for-profit degrees have spiked in the past decade even though some of these degrees often confer little in the way of increased skills and employment prospects.⁶⁵ The student debt incurred to pay for these degrees is often differentiated along income and racial/ethnic lines as well, putting far too many millennials and their families at risk for other economic hardships down the road.⁶⁶

The numbers of U.S. low-performing millennials with attachments to the labor market is the other aspect of connection that bears greater scrutiny. Here again, especially in a U.S. labor market that has a large proportion of jobs at the lower end of the skill spectrum, employment in no way protects individuals from exposure to the difficulties associated with low skills.⁶⁷ In

fact, as one study has shown, while many low-skilled individuals are more likely to be employed in the United States, this employment often does not provide much protection. Low-skilled employed individuals are more at risk of being expelled from the labor market in a downturn in the economy and to earn low wages, and are often not in a position to advance their skills.⁶⁸ Of the estimated 10.4 million millennials who performed at or below Level 1 in literacy, nearly two-thirds (65 percent) were employed full time (43 percent) or part time (22 percent) (Table 9). That implies that approximately 6.7 million millennials who have some connection to the labor market may struggle with basic literacy skills such as comparing, contrasting, or reasoning about information provided. When we look at performance on the numeracy domain, the figures are even more striking: An estimated 12 million millennials who are employed full or part time may struggle with basic numeracy skills such as identifying and acting on numerical information and ideas—even when they are embedded in common contexts where the content is fairly explicit or visual and the information is conveyed with few distractors.

Table 9: Estimated number and percentage of millennials at select proficiency levels on PIAAC literacy and numeracy scales, by current employment status: 2012/2014

	Total Millennial Population	Employed Full-Time		Employed Part-Time		Out of the Labor Force		Unemployed		
	Estimate (millions)	Estimate (millions)	%	Estimate (millions)	%	Estimate (millions)	%	Estimate (millions)	%	
LITERACY										
At or Below Level 1	10.4	4.4	43*	2.3	22	2.2	21	1.5	14*	
At Level 2	25.7	10.9	43*	6.6	26	5.3	21	2.8	11*	
At or Above Level 3	40.5	21.0	52	9.9	25	6.9	17	2.6	6	
NUMERACY										
At or Below Level 1	19.4	7.4	38*	4.6	24	4.6	24*	2.9	15*	
At Level 2	26.6	12.0	45*	7.0	26	4.9	19	2.6	10*	
At or Above Level 3	30.7	17.0	56	7.2	24	4.9	16	1.5	5	

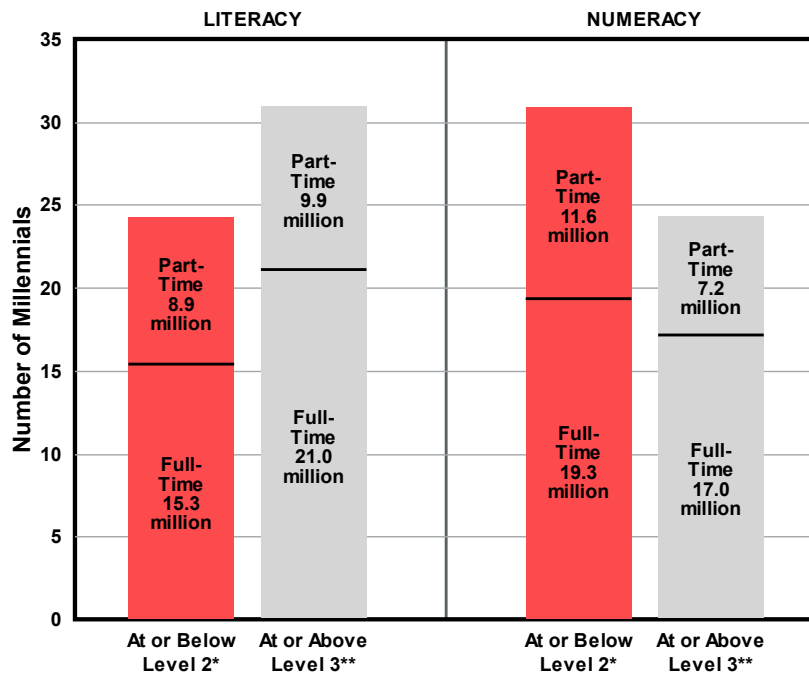
*Statistically different ($p < .05$) from "At or Above Level 3"

Note: Totals are based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Adding to this are the number of employed millennials who perform at Level 2. In terms of employment, we observe that in literacy, an estimated 26 million (34 percent of all millennials) performed at Level 2; of those, an estimated 17.5 million (69 percent) were employed either full or part time. In numeracy, nearly 27 million millennials (35 percent of all millennials) performed at Level 2; of those, roughly 19 million (71 percent) worked full or part time (see Appendix Table A-3 for greater detail). In total, there were more millennials working full and part time below Level 3—meaning they were low skilled—than at or above (Figure 3). While this pattern was reversed in literacy, there were an estimated 24 million millennials with low skills.

Figure 3: Estimated numbers of employed millennials performing at select proficiency levels on PIAAC literacy and numeracy scales: 2012/2014



*At or Below Level 2 = At or below Level 1, and Level 2

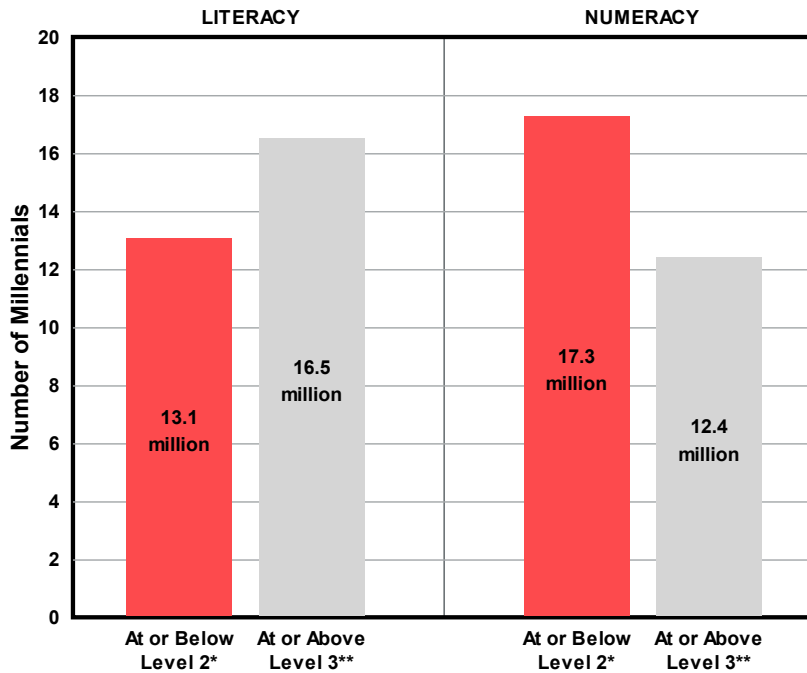
**At or Above Level 3 = Levels 3, 4 and 5

Note: Totals are based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

When we examined Level 2 skills and educational status, we found that over 10 million millennials in each domain were enrolled in some form of education/certificate program. In fact, in numeracy, reflecting a pattern we found for employment, there were more millennials currently enrolled in education/certificate programs with skills at or below Level 2 than there were at or above Level 3 (Figure 4).

Figure 4: Estimated numbers of millennials performing at select proficiency levels on PIAAC literacy and numeracy scales who are enrolled in education: 2012/2014



*At or Below Level 2 = At or below Level 1, and Level 2

**At or Above Level 3 = Levels 3, 4, and 5

Note: Totals are based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

The PIAAC data give us some indication of the kinds of occupations and remuneration of these low-skilled millennials. In numeracy, while a little more than half (51 percent) of millennials who performed at or above Level 3 worked in skilled occupations (e.g., legislators, senior officials and managers, professionals, technicians, and associate professionals), 43 percent of those who performed at or below Level 1, and 43 percent of those who performed at Level 2, worked in semi-skilled white-collar occupations (e.g., clerks, service workers, and shop and market sales workers). In literacy, the patterns are similar. However, those millennials who performed at or below Level 1 in literacy were about three times more likely to work in elementary occupations (e.g., food preparation assistants, routine machine laborers, and cleaning persons) than those performing at or above Level 3 (Appendix Table A-7).

The link between skills and wages has been well documented in labor market surveys and research, and the PIAAC data are in line with the general findings. As a forthcoming report will demonstrate, there is a strong association between the greater productive abilities of workers, higher levels of educational attainment, and stronger literacy and numeracy proficiencies. These generally translate into "improved employment and earnings outcomes in U.S. labor markets," where the earnings advantages for adults 25-65 associated with high skills levels in both literacy and numeracy are quite large.⁶⁹ This is also reflected in the PIAAC data for young adults: Those with lower skill levels earn less. Around three-quarters, or 76 percent, of those who scored at or below Level 1 on the PIAAC literacy scale earned in the lowest two quintiles of income; that is, less than \$2,300 monthly and less than \$28,000 annually (Appendix Table A-8). What's more, many of these millennials are all but locked into low-skilled/low-wage jobs.

Current research on occupations utilizing the PIAAC data demonstrates that while some employment-related upskilling occurs, businesses tend to prioritize opportunities for additional education to key management and staff rather than to their lowest skilled employees.⁷⁰ A National Skills Coalition report also revealed that many adults employed in low-skills jobs in the service sector industry in the United States lack the necessary literacy and numeracy skills to fully exploit opportunities to advance within service-sector companies, which creates "an invisible drag on productivity and worker mobility."⁷¹ In addition to the obvious benefit of increased wages and educational prospects, a host of other advantages accrue to employees who have access to better employment opportunities (e.g., retirement savings plans, affordable health care, paid sick time, and so on). Though the latest PIAAC survey did not measure all of these indicators of employment benefits, the data do support that lower-performing millennials are less likely than their higher-skilled peers to have health insurance (Appendix Table A-9).

By highlighting ties to formal education and the labor market, the research on disconnection focuses attention on a clearly vulnerable segment of the youngest adult population. But the expanded notion of disconnection offered here—one of marginalization due to low skills—reveals a more nuanced picture of the challenges a generation of low-skilled young adults faces today. While there is clearly a positive relationship between skill proficiency and education, research has shown that there is a wide variation of skill levels within each category of educational attainment. Moreover, even though the U.S. labor market accommodates a great many of those with low skills, employment for these individuals may provide only limited advantages.⁷² Millions of millennials traversing the path to adulthood lack the necessary skills that could allow them to fully take advantage of the opportunities that may be available to them—even though many have finished high school, maintain connections to formal postsecondary education, or participate in the labor market. Equally important, research shows that skills correlate to individuals' feelings of connectedness to the larger society and their overall well-being, including their levels of trust and engagement with others and social institutions. In the next section, we explore these important non-labor-market factors associated with skills.

Social Capital

At the end of the nineteenth century—the beginning of the modern age—Emile Durkheim, the French philosopher, worried a lot about the fraying connections between individuals and their society. So tightly bound did he believe the individual and society to be that he specifically studied how rates of suicide—what he termed "anomic suicide"—could be tied to the level of social disarray. It's curious—and frightening—that researchers and the media have begun to document a new phenomenon in America: the rise of suicides (particularly among those with low levels of educational attainment—the only measure of skills used in these studies) in what have come to be known as "deaths of despair."⁷³ Angus Deaton and Anne Case, authors of a study on the rise of the death rate among white middle-age Americans with less than a high school education, acknowledge that the concern indeed extends to the millennial population. "America is not a great place for people with only a high school degree," Case notes, "and I don't think that's going to get better any time soon."⁷⁴ The large number of millennials with low skill levels, along with the complex and important relationship between skills and what researchers call "social capital," clearly has far reaching and profound consequences.

How skills exactly interact with social capital is a complex and critical question. The OECD launched an initiative to examine patterns of trust, an important component of social capital, across its member nations in the aftermath of the 2008 global financial crisis. In a 2015 report, they found evidence that nations with higher overall cognitive skills exhibited higher levels of trust.⁷⁵ In 2014, Patricia Dinis da Costa et al., of the European Commission's Joint Research Centre, explored the relationship between education, skills, and social well-being across select PIAAC participating European Union countries. Her data indicate that "individuals' competences and abilities are key for an effective and fruitful participation in the social and economic life of current globalized economies."⁷⁶

PIAAC data allows us to explore how skill levels align with notions of social capital through a number of questions in the background questionnaire.⁷⁷ Here, as in the section above, we examine these issues by looking at the percentages computed on the total number *at each skill level*. Aspects of an individual's level of trust are examined using two questions: "There are only a few people you can trust completely" and "If you are not careful, other people will take advantage of you." Our analysis shows that for all millennials, high levels of trust in others is not evident. However, those with lower skill levels appear to have lower levels of trust than their higher-skilled peers. Just over three quarters of the millennials who performed at or below Level 1 (76 percent in literacy and 77 percent in numeracy) reported that they either agreed or strongly agreed with the statement that "There are only a few people who you can trust completely" (Table 10). These percentages were higher than those who performed at or above Level 3 (65 percent in literacy and 62 percent in numeracy). In addition, 82 percent of those who performed at or below Level 1 in literacy and 84 percent in numeracy agreed or strongly agreed that "If you are not careful, other people will take advantage of you"—likewise higher than for those who performed at or above Level 3 in both domains (74 and 72 percent in literacy and numeracy, respectively). According to the Pew Research Center, "people who feel vulnerable or disadvantaged for whatever reason find it riskier to trust because they're less well-fortified to deal with the consequences of misplaced trust."⁷⁸ These data on trust should be seen as especially alarming, particularly in regard to a population that is entering adulthood.

Research also shows that levels of trust correlate to donations of time and money.⁷⁹ Rates of volunteerism were ascertained in PIAAC with a question that asked participants, "In the last 12 months, how often, if at all, did you do voluntary work, including unpaid work for a charity, political party, trade union or other non-profit organization?" Mirroring findings on trust, 63

percent of those who performed at or below Level 1 in literacy and 57 percent in numeracy reported that they never volunteer, while 35 percent of those who performed at or above Level 3 in literacy and 33 percent in numeracy reported never volunteering.

Adults taking PIAAC were also asked about their level of political efficacy ("People like me don't have any say about what the government does"). Again, as we observed with measures of trust, lower-skilled millennials were more likely to report unfavorable attitudes vis-à-vis this aspect of social capital. In fact, millennials who performed at or below Level 1 were 20 percentage points more likely in literacy and 17 points in numeracy to believe they "don't have any say about what the government does" than those who performed at or above Level 3. Given the strong correlation between skills and income, Robert Putnam's succinct statement on the divide between the haves and have-nots in terms of impact on government likely applies here: "Rich kids are more confident that they can influence government, and they are largely right about that. Not surprisingly, poor kids are less likely to try."⁸⁰

PIAAC data related to social capital—social trust, political efficacy, and civic engagement—provide nuance to a general pattern reported in other surveys and research. Pew's data confirm that, as a group, millennials are less likely than older cohorts to possess social and political affiliations and have trust in public institutions.⁸¹ Pew attributed some of the divide between cohorts to the higher percentage of minorities and those of lower socioeconomic status among the younger cohorts; while plausible, another reason for low levels of trust among the millennial population (or portions thereof) may also lie in the complex relationship between skill levels, opportunity, and life outcomes.

Table 10: Percentage of millennials performing at select proficiency levels on PIAAC literacy and numeracy scales, by social cohesion indicators: 2012/2014

	At or Below Level 1	Level 2	At or Above Level 3
There are only a few people you can trust completely			
LITERACY			
Agree or Strongly Agree	76*	75*	65
Neither Agree or Disagree	9	9	10
Disagree or Strongly Disagree	15*	16*	24
Total	100	100	100
NUMERACY			
Agree or Strongly Agree	77*	74*	62
Neither Agree or Disagree	10	9	11
Disagree or Strongly Disagree	13*	17*	27
Total	100	100	100
If you are not careful, other people will take advantage of you			
LITERACY			
Agree or Strongly Agree	82*	83*	74
Neither Agree or Disagree	8*	9*	15
Disagree or Strongly Disagree	10	8	10
Total	100	100	100
NUMERACY			
Agree or Strongly Agree	84*	82*	72
Neither Agree or Disagree	7*	10*	17
Disagree or Strongly Disagree	8	8	11
Total	100	100	100
In the last 12 months, how often, if at all, did you do voluntary work, including unpaid work for a charity, political party, trade union or other non-profit organization?			
LITERACY			
Never	63*	48*	35
At least once a month but less than once a week	25*	41*	53
Once a week to every day	12	11	12
Total	100	100	100
NUMERACY			
Never	57*	43*	33
At least once a month but less than once a week	31*	45*	55
Once a week to every day	12	11	12
Total	100	100	100
People like me don't have any say about what the government does			
LITERACY			
Agree or Strongly Agree	50*	41*	30
Neither Agree or Disagree	24	25	25
Disagree or Strongly Disagree	26*	35*	45
Total	100	100	100
NUMERACY			
Agree or Strongly Agree	47*	36*	30
Neither Agree or Disagree	23	27	24
Disagree or Strongly Disagree	30*	38*	45
Total	100	100	100

*Statistically significant from "At or Above Level 3"

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

How to read this chart: This chart shows the share of millennials at three proficiency levels (at or below Level 1, Level 2 and at or above Level 3) for literacy and numeracy across a series of questions that appeared on the PIAAC background questionnaire. Looking at the first question for which data are reported here—"There are only a few people you can trust completely"—the PIAAC data show that 76 percent of millennials performing at or below Level 1 in literacy agreed or strongly agreed that there are only a few people they can trust completely. This compares to 65 percent of millennials who performed at above Level 3 in literacy; this percentage difference is statistically significant. Three quarters (75 percent) of the millennials who scored at Level 2 agree or strongly agree that there are only a few people whom they can trust completely, which again is significantly different from the percentage that reported agreeing or strongly agreeing with this statement who had skills at or above Level 3.

Implications

Nearly half of America's millennials—around 36 million—are attempting the transition to adult roles with low literacy skills, and more than half—about 46 million—are doing so with low numeracy skills. Millennials with low skills are more likely to be unemployed, out of the labor force, working in low-skill occupations, and earning low incomes and are less likely to have health-care coverage than those with higher skills. In addition, they are less likely to have trust in others, be civically engaged, and feel as though they can influence government. These are not numbers and correlations that can or should be easily brushed aside. They are especially troubling when we consider the increasingly inequitable opportunities to acquire and develop human capital among our millennial population, and how this relates to compounding advantage and disadvantage in the United States today.

By relying exclusively on disconnection from the labor market and education as a measure of the problem, perhaps we have been applying twentieth-century criteria to understanding a twenty-first century challenge. For much of the last century, the United States was seen as a leader in years of schooling it provided its citizens. A four-year college degree was financially attainable for increasing numbers of Americans. In the three decades of the immediate post-World War II period, a high school degree provided many with sufficient skills to obtain employment that could support a middle class life: sustainable wages, access to health care, and other employee benefits, such as pensions and retirements and affordable higher educational opportunities for one's children. During this period, if you were disconnected from employment or education and you were between 16 and 24 years old, you were likely at risk for an insecure future.

The end of the twentieth century saw the convergence of a number of key changes that altered this equation. We had moved, for better or worse, toward an economy reliant on a global supply chain facilitated by an array of technological advances and policy decisions. As Thomas Friedman argued in 2005, the world had flattened.⁸² This seismic shift had significant consequences around the globe; in the United States, the shift impacted many facets of life as well, but perhaps especially the nature of work and the need for skills. This new economy differed in important ways from the fast-paced growth of the U.S. economy in the postwar period, when opportunities were abundant for a broad cross-section of the population. Today, though, fewer sustainable opportunities are available to those lacking higher-level skills. And the work that is available for the low-skilled population often carries its own set of risks. Many hourly jobs in the burgeoning services sector—where so many with low skills find employment—do not provide health insurance, retirement benefits, sustainable wages, or even reliable hours. Making matters worse, while educational attainment rates—for both high school and many forms of postsecondary education—have increased,⁸³ many young adults who have either obtained or are pursuing such degrees nonetheless lack critical skills to advance economically and may be additionally burdened by debt for the postsecondary education they have received. In other words, a sizable number of low-skilled millennials *are* employed *or* enrolled in education. Defining connection as simply having associations to employment and education therefore obscures a more uncomfortable reality. Disadvantages are mounting for far too many of America's millennials—including some of those who are "connected" in the more traditional sense.

Having so many of our young adults with low levels of human capital jeopardizes more than the ability of some to achieve success in the marketplace. It also threatens our core democratic traditions and institutions. One Constitutional scholar, Ganesh Sitaraman, insists that "the American Constitution is based on the prerequisite that the nation has relative economic

equality—a strong middle class, no extreme wealth or poverty, and economic opportunity."⁸⁴ He contends that "in contrast to two millennia of constitutions premised on class inequality, our Constitution was forged, in part, on trying to rebuild the economic fortunes of ordinary people."⁸⁵ Barry C. Lynn, who writes about the dangers of the consolidation of corporate power, recently spoke to this point when he asserted that at heart, the framers of the Constitution strove to build a society where citizens would have the "ability to engage in an open, deliberative conversation with one another so that they could actually make ... day-to-day decisions about how to maintain the society."⁸⁶ True, in the framers' vision, the notion of equality of condition applied to the white population of European descent, but equally true is that this was a stunning and radical departure from the societies of Europe at the end of the eighteenth century, one that allowed for the expansion of the political community. What we observe in the skills data can be read as part of this broader narrative, one that reaches deep into our political tradition. Literacy, and the knowledge acquired through literacy, can be viewed as essential to the acquisition and maintenance of economic equality *and* an informed and engaged citizenship. The two go hand-in-hand. If left unchecked, the disparities in the skills of our young adults will only deepen inequality and the social anomie that Durkheim so feared.

In reports such as this, it is common to expect policy recommendations that will begin to move us toward solving the problems identified. For all the insights that the PIAAC data can provide, its real power lies in the ability to better illuminate where we are and, thus, where we are headed if we do not change course. The authors of a recent ETS report, *Choosing Our Future: A Story of Opportunity in America*, took an expansive look at the issue of inequality of opportunity and argued that we are at a decisive moment that requires us to "develop sufficiently strong countervailing forces" to interrupt this current trend. To do so will require a framework for action that, at its core, speaks to a "coherent and sustained effort on the part of *all*—individuals, community organizations and associations, nongovernmental organizations, religious institutions, business, and government at all levels."⁸⁷ Indeed, there appears to be a growing recognition that to truly expand opportunity requires comprehensive action across the multitude of interconnected economic and social systems that shape our lives, in particular, education, housing, government, community and family.⁸⁸ Yet all too often, solutions intended to address inequities in human capital are framed solely in the context of educational systems. Real improvements are possible only when the full breadth of the problem is understood and a coordinated effort cognizant of how we acquire and nurture human capital over a lifetime is pursued and then sustained for future generations. Here, we are reminded of James Baldwin's statement in confronting race relations in the 1960s: "Not everything that is faced can be changed, but nothing can be changed until it is faced."

Above and beyond this, it is becoming increasingly clear that those whom we allow to fail or fall behind are really not so much "them" as they are "us." In ways that may not be wholly apparent, particularly in times of social upheaval, Americans are inextricably bound to one another even as they are being drawn apart. We depend on those in the labor market to earn salaries that allow them to purchase goods and support other industries; we have systems of a welfare state that depend on the income of working-age adults (Social Security, welfare, Medicaid), and we rely on the taxes of working adults to fund public programs at the national, state, and local levels. The phrase "a rising tide lifts all boats" was popularized during the Age of Affluence in post-World War II America to signify that positive changes in the economy should and would have a ripple effect and lift those in need, in essence tying together those with more and less opportunity in a joint, albeit idealized, venture.⁸⁹ But the Age of Affluence, which had at its core a broad middle class supported by skills that were well remunerated in the labor market, is in the past. Our task now is to reaffirm a shared contract that holds even when tides are at low ebb. Then, especially, we need to see our fate as coupled to the fate of others.

Appendices

Appendix A: Detailed tables

Table A-1: Average scores and standard errors on the PIAAC literacy and numeracy scales for millennials, by participating country: 2012/2014

Country	LITERACY		NUMERACY	
	Mean	SE	Mean	SE
Austria	279	1.0	281*	1.3
Belgium	288*	1.3	289*	1.4
Canada	281	0.9	273*	1.1
Chile	236*	2.7	221*	3.3
Cyprus	271*	1.3	269*	1.4
Czech Republic	284*	1.5	284*	1.3
Denmark	279	1.1	280*	1.3
Estonia	286*	1.1	281*	1.1
Finland	303*	1.3	294*	1.3
France	277	1.0	267*	1.0
Germany	280	1.3	279*	1.3
Greece	257*	1.7	255*	1.6
Ireland	274*	1.2	262	1.5
Israel	266*	1.2	258	1.3
Italy	260*	1.8	258	1.8
Japan	305*	1.2	291*	1.2
Korea, Republic of	291*	1.1	281*	1.3
Lithuania	277	1.6	280*	1.7
Netherlands	296*	1.2	289*	1.2
New Zealand	282*	1.3	271*	1.6
Norway	282*	1.1	278*	1.4
Poland	279	1.0	270*	0.9
Russian Federation	273	3.3	270*	3.4
Singapore	285*	1.1	286*	1.2
Slovak Republic	277	1.0	278*	1.2
Slovenia	271*	1.4	273*	1.5
Spain	263*	1.1	257*	1.0
Sweden	286*	1.3	283*	1.2
Turkey	235*	2.1	231*	2.5
United Kingdom	273	1.7	262	1.9
United States	277	1.5	261	1.5
<i>Average</i>	277	0.3	271*	0.3

*Significantly different from United States at .05 level.

SE = Standard error

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Table A-2: Percentage and standard errors for millennials by participating country/region, by performance at select proficiency levels on PIAAC literacy and numeracy scales: 2012/2014

LITERACY

Country	At or Below Level 1		At Level 2		At or Above Level 3	
	%	SE	%	SE	%	SE
Austria	11	1.0	32	1.3	57	1.2
Belgium	9	0.8	25	1.3	66	1.4
Canada	12	0.7	31	1.3	57	1.3
Chile	41	2.6	38	2.1	21	2.4
Cyprus	13	1.1	39	1.6	48	1.5
Czech Republic	8	1.0	31	2.1	61	1.9
Denmark	12	0.8	31	1.6	58	1.6
Estonia	9	0.8	29	1.3	63	1.3
Finland	5	0.7	18	1.4	77	1.4
France	13	0.8	33	1.1	54	1.2
Germany	13	1.0	29	1.3	58	1.4
Greece	24	1.6	41	1.8	34	1.7
Ireland	13	1.0	38	1.3	50	1.3
Israel	21	1.2	34	1.2	45	1.2
Italy	21	1.7	39	1.8	40	1.9
Japan	2	0.5	17	1.2	81	1.2
Korea, Republic of	4	0.5	26	1.4	70	1.4
Lithuania	9	1.1	37	1.8	53	2.1
Netherlands	7	0.8	22	1.0	72	1.2
New Zealand	11	0.9	31	1.3	58	1.5
Norway	12	0.9	27	1.3	61	1.3
Poland	12	0.8	33	1.2	55	1.1
Russian Federation	14	2.1	36	2.4	50	3.3
Singapore	10	0.7	28	1.2	62	1.2
Slovak Republic	11	0.8	33	1.2	56	1.3
Slovenia	15	1.1	35	1.4	50	1.4
Spain	19	1.1	40	1.2	41	1.2
Sweden	10	0.8	25	1.4	65	1.5
Turkey	38	2.4	46	2.3	15	1.4
United Kingdom	16	1.4	33	1.9	51	1.8
United States	14	0.9	34	1.2	53	1.5
<i>Average</i>	14	0.2	32	0.3	54	0.3

SE = Standard error

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Table A-2: Percentage and standard errors for millennials by participating country/region, by performance at select proficiency levels on PIAAC literacy and numeracy scales: 2012/2014 (continued)

NUMERACY

Country	At or Below Level 1		At Level 2		At or Above Level 3	
	%	SE	%	SE	%	SE
Austria	12	1.0	30	1.3	58	1.5
Belgium	9	0.8	26	1.2	65	1.2
Canada	18	0.8	31	1.0	50	1.1
Chile	53	2.8	32	1.9	16	1.9
Cyprus	16	1.3	38	1.7	46	1.6
Czech Republic	10	0.9	30	1.7	60	1.7
Denmark	13	1.0	30	1.4	57	1.4
Estonia	11	0.7	32	1.1	57	1.3
Finland	8	0.8	24	1.1	68	1.2
France	20	1.0	34	1.1	46	1.0
Germany	15	1.1	29	1.3	56	1.4
Greece	27	1.7	40	1.8	33	1.5
Ireland	21	1.1	39	1.4	41	1.5
Israel	27	1.2	32	1.3	41	1.1
Italy	25	1.9	37	1.9	37	1.8
Japan	7	0.9	27	1.4	67	1.4
Korea, Republic of	8	0.8	35	1.9	58	1.8
Lithuania	11	1.0	33	1.7	56	1.9
Netherlands	9	1.0	27	1.5	64	1.2
New Zealand	19	1.0	32	1.3	49	1.3
Norway	15	1.1	28	1.4	57	1.4
Poland	17	0.8	36	1.1	47	1.1
Russian Federation	15	2.3	37	2.2	47	3.3
Singapore	12	0.7	25	1.1	63	1.2
Slovak Republic	13	0.9	30	1.3	57	1.3
Slovenia	16	1.1	32	1.3	51	1.4
Spain	22	1.0	43	1.5	35	1.3
Sweden	12	0.9	27	1.8	60	1.7
Turkey	43	2.6	39	2.3	18	1.3
United Kingdom	24	1.5	34	1.7	42	1.7
United States	25	1.1	35	1.4	40	1.5
<i>Average</i>	18	0.2	32	0.3	50	0.3

SE = Standard error

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Table A-3: Estimated number, percentage, and standard error by employment and current education status for millennials, by performance at select proficiency levels on PIAAC literacy and numeracy: 2012/2014

	At or Below Level 1				At Level 2				At or Above Level 3*				Total	
	Estimate	SE	%	SE	Estimate	SE	%	SE	Estimate	SE	%	SE	Estimate	SE
LITERACY														
Employment Status														
Employed full-time (35+ hours/week)	4,400,000	500,000	12	1.3	10,900,000	700,000	30	1.7	21,000,000	700,000	58	1.9	36,400,000	800,000
Employed 1-35 hours	2,300,000	300,000	12	1.8	6,600,000	600,000	35	3.1	9,900,000	700,000	53	2.9	18,800,000	700,000
Out of the labor force	2,200,000	300,000	15	1.6	5,300,000	500,000	37	2.6	6,900,000	500,000	48	2.7	14,400,000	600,000
Unemployed	1,500,000	200,000	22	2.5	2,800,000	300,000	41	3.4	2,600,000	200,000	37	3.1	6,900,000	200,000
Employment and Education Status														
In Education														
Employed full-time (35+ hours/week)	500,000	100,000	7	1.9	1,800,000	300,000	27	4.1	4,200,000	300,000	66	4.2	6,400,000	800,000
Employed 1-35 hours	1,000,000	200,000	9	1.7	3,700,000	500,000	34	4.1	6,200,000	600,000	57	3.9	10,900,000	1,200,000
Out of the labor force	1,100,000	200,000	13	2.0	3,200,000	300,000	36	3.3	4,600,000	400,000	52	3.6	9,000,000	1,000,000
Unemployed	600,000	100,000	17	4.1	1,300,000	200,000	39	5.4	1,500,000	200,000	44	5.0	3,300,000	500,000
Not In Education														
Employed full-time (35+ hours/week)	4,000,000	400,000	13	1.4	9,200,000	700,000	31	1.9	16,800,000	600,000	56	2.0	30,000,000	1,700,000
Employed 1-35 hours	1,300,000	200,000	16	3.0	2,900,000	300,000	37	4.0	3,700,000	400,000	47	3.9	7,900,000	1,000,000
Out of the labor force	1,100,000	200,000	20	3.3	2,100,000	300,000	38	4.1	2,300,000	300,000	42	3.9	5,400,000	800,000
Unemployed	900,000	100,000	26	3.4	1,500,000	200,000	43	4.5	1,100,000	200,000	31	4.0	3,600,000	500,000

*At or Above Level 3 = Levels 3, 4 and 5

Note: Totals are based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Table A-3: Estimated number, percentage, and standard error by employment and current education status for millennials, by performance at select proficiency levels on PIAAC literacy and numeracy: 2012/2014

	At or Below Level 1				At Level 2				At or Above Level 3*				Total	
	Estimate	SE	%	SE	Estimate	SE	%	SE	Estimate	SE	%	SE	Estimate	SE
NUMERACY														
Employment Status														
Employed full-time (35+ hours/week)	7,400,000	600,000	20	1.5	12,000,000	700,000	33	1.8	17,000,000	700,000	47	2.1	36,400,000	800,000
Employed 1-35 hours	4,600,000	500,000	24	2.4	7,000,000	500,000	37	2.5	7,200,000	600,000	38	2.6	18,800,000	700,000
Out of the labor force	4,600,000	400,000	32	2.1	4,900,000	400,000	34	2.5	4,900,000	500,000	34	2.8	14,400,000	600,000
Unemployed	2,900,000	200,000	41	2.9	2,600,000	200,000	37	3.4	1,500,000	200,000	22	2.9	6,900,000	200,000
Employment and Education Status														
In Education														
Employed full-time (35+ hours/week)	1,000,000	200,000	15	2.7	2,000,000	300,000	32	5.1	3,400,000	400,000	53	5.2	6,400,000	900,000
Employed 1-35 hours	2,100,000	300,000	19	2.6	4,100,000	400,000	37	3.0	4,800,000	400,000	44	3.2	10,900,000	1,100,000
Out of the labor force	2,600,000	300,000	29	2.7	3,000,000	300,000	33	3.6	3,400,000	400,000	38	3.9	9,000,000	1,100,000
Unemployed	1,200,000	200,000	35	4.5	1,300,000	200,000	40	5.8	900,000	200,000	25	4.4	3,300,000	500,000
Not In Education														
Employed full-time (35+ hours/week)	6,400,000	500,000	21	1.6	9,900,000	700,000	33	1.9	13,600,000	600,000	45	2.1	30,000,000	1,800,000
Employed 1-35 hours	2,500,000	300,000	31	4.0	3,000,000	400,000	38	4.0	2,500,000	300,000	31	3.8	7,900,000	1,000,000
Out of the labor force	2,000,000	200,000	36	3.5	2,000,000	300,000	36	4.3	1,500,000	300,000	28	4.1	5,400,000	800,000
Unemployed	1,700,000	200,000	47	4.0	1,300,000	100,000	35	3.3	600,000	100,000	18	3.5	3,600,000	500,000

*At or Above Level 3 = Levels 3, 4 and 5

Note: Totals are based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Table A-4: Percentage of millennials by select country/region, by native born or native language, or foreign born and foreign language status: 2012/2014

Either Native Born or Native Language (percent in descending order)		Foreign Born and Foreign Language (percent in descending order)	
Nation	%	Nation	%
France	94*	Canada	15*
Spain	93*	Sweden	15*
Netherlands	92	Norway	14*
Italy	91	Austria	13*
United States	91	Denmark	13*
Germany	89*	Ireland	13*
England and Northern Ireland (UK)	89*	Germany	11*
Austria	87*	England and Northern Ireland (UK)	11*
Denmark	87*	Italy	9
Ireland	87*	United States	9
Norway	86*	Netherlands	8
Canada	85*	Spain	7*
Sweden	85*	France	6*

* Significantly different ($p < .05$) from United States.

Table A-5: Average scores for millennials on PIAAC literacy and numeracy scales by native born or native language, and foreign born and foreign language status, by select country/region: 2012/2014

LITERACY				NUMERACY			
Either Native Born or Native Language		Foreign Born and Foreign Language		Either Native Born or Native Language		Foreign Born and Foreign Language	
Netherlands	300*	Canada	262*	Sweden	293*	Canada	256
Sweden	296*	Ireland	253	Netherlands	293*	Ireland	249
Norway	289*	Netherlands	252	Austria	287*	Netherlands	245
Denmark	285*	England and N. Ireland (UK)	247	Norway	286*	Germany	242
Germany	284	Germany	246	Denmark	286*	Denmark	240
Austria	284*	United States	245	Germany	283*	Austria	238
Canada	284	Austria	243	Canada	275*	United States	236
United States	281	Norway	239	France	270*	England and N. Ireland (UK)	232
France	279	Denmark	237	England and N. Ireland (UK)	266	Norway	228
England and N. Ireland (UK)	277	France	234	Ireland	264	Italy	227
Ireland	277*	Sweden	230*	United States	263	Sweden	226
Spain	266*	Spain	227*	Italy	261	Spain	223
Italy	264*	Italy	222*	Spain	259*	France	218

* Significantly different ($p < .05$) from United States.
Table is sorted in descending order on average score.

Table A-6: Percentage of millennials by select country/region performing at or below Level 1 on PIAAC literacy and numeracy scales, by native born or native language and foreign born and foreign language status: 2012/2014

	LITERACY			NUMERACY	
	Either Native Born or Native Language	Foreign Born and Foreign Language		Either Native Born or Native Language	Foreign Born and Foreign Language
Austria	8	34*	Austria	8	37*
Canada	10	22*	Canada	17	28*
Denmark	8	38*	Denmark	10	38*
France	11	42*	France	18	54*
Germany	10	37*	Germany	12	41*
Ireland	11	25*	Ireland	20	27
Italy	18	48*	Italy	23	43*
Netherlands	5	31*	Netherlands	7	34*
Norway	7	40*	Norway	10	44*
Spain	17	43*	Spain	21	48*
Sweden	4	44*	Sweden	7	44*
United Kingdom	14	33*	United Kingdom	21	43*
United States	11	37*	United States	24	43*

* Significantly different (p < .05) from "Native born or native language"

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Table A-7: Estimated number and percentage of millennials performing at select proficiency levels on PIAAC literacy and numeracy scales, by occupation status: 2012/2014

	Total Millennials	Elementary Occupations		Semi-Skilled Blue-Collar Occupations		Semi-Skilled White-Collar Occupations		Skilled Occupations	
	Estimate (millions)	Estimate (millions)	%	Estimate (millions)	%	Estimate (millions)	%	Estimate (millions)	%
LITERACY									
At or Below Level 1	8.4	2.2	26*	1.7	21*	3.2	38	1.3	15*
At Level 2	22.3	3.4	15*	3.6	16*	9.7	43*	5.6	25*
At or Above Level 3	37.7	3	8	3.9	10	13.1	35	17.7	47
NUMERACY									
At or Below Level 1	15.4	3.3	21*	2.5	16*	6.7	43*	2.9	19*
At Level 2	23.9	3.2	13*	3.3	14*	10.3	43*	7	30*
At or Above Level 3	29.1	2.1	7	3.4	12	9	31	14.7	51

* Significantly different (p < .05) from "At or Above Level 3"

Note: Totals are based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Table A-8: Monthly and yearly earnings for U.S. adults by quintile: 2012/2014

Earnings by quintile	Monthly	Yearly
Bottom quintile	Less than \$1300	Less than \$16000
Lower-middle quintile	\$1300 to \$2300	\$16000 to \$28000
Middle quintile	\$2300 to \$3500	\$28000 to \$42000
Upper-middle quintile	\$3500 to \$5600	\$42000 to \$67000
Top quintile	\$5600 to more	\$67000 or more

Note: Yearly earnings quintiles are arrived at by multiplying unrounded monthly earnings by 12 (months in a year). Estimates are rounded to the nearest hundred for the monthly earnings, and rounded to the nearest thousand for the yearly earnings.
Source: U.S. Department of Education, National Center for Education Statistics, Programme for the International Assessment of Adult Competencies (PIAAC), U.S. PIAAC 2012/2014; Organization for Economic Cooperation and Development, PIAAC 2012.

Table A-9: Estimated number and percentage of millennials performing at select proficiency levels on PIAAC literacy and numeracy scales, by health insurance status: 2012/2014

	Total Millennial		Have Health Insurance		Do Not Have Health Insurance	
	Estimate (millions)	Estimate (millions)	%	Estimate (millions)	%	
LITERACY						
At or Below Level 1	10.3	5.8	56*	4.5	44*	
At Level 2	25.5	18.3	72*	7.2	28*	
At or Above Level 3	40.3	34.3	85	6	15	
NUMERACY						
At or Below Level 1	19.2	12.4	65*	6.8	35*	
At Level 2	26.4	19.2	73*	7.1	27*	
At or Above Level 3	30.6	26.8	88	3.8	12	

* Significantly different ($p < .05$) from "At or Above Level 3"

Note: Totals are based on the sum of the unrounded numbers.

Source: Organisation for Economic Co-operation and Development (OECD), Programme for the International Assessment of Adult Competencies (PIAAC), 2012/2014

Appendix B: PIAAC proficiency levels

See below for the detailed descriptions of the PIAAC proficiency levels for literacy and numeracy.⁹⁰

PIAAC Proficiency Levels for Literacy

Achievement level and score range	Task descriptions
Below Level 1 0 - 175	The tasks at this level require the respondent to read brief texts on familiar topics to locate a single piece of specific information. There is seldom any competing information in the text and the requested information is identical in form to information in the question or directive. The respondent may be required to locate information in short continuous texts. However, in this case, the information can be located as if the text were non-continuous in format. Only basic vocabulary knowledge is required, and the reader is not required to understand the structure of sentences or paragraphs or make use of other text features. Tasks below Level 1 do not make use of any features specific to digital texts.
Level 1 176 - 225	Most of the tasks at this level require the respondent to read relatively short digital or print continuous, non-continuous, or mixed texts to locate a single piece of information that is identical to or synonymous with the information given in the question or directive. Some tasks, such as those involving non-continuous texts, may require the respondent to enter personal information onto a document. Little, if any, competing information is present. Some tasks may require simple cycling through more than one piece of information. Knowledge and skill in recognizing basic vocabulary determining the meaning of sentences, and reading paragraphs of text is expected.
Level 2 226 - 275	At this level, the medium of texts may be digital or printed, and texts may comprise continuous, non-continuous, or mixed types. Tasks at this level require respondents to make matches between the text and information, and may require paraphrasing or low-level inferences. Some competing pieces of information may be present. Some tasks require the respondent to <ul style="list-style-type: none"> ▪ cycle through or integrate two or more pieces of information based on criteria; ▪ compare and contrast or reason about information requested in the question; or ▪ navigate within digital texts to access and identify information from various parts of a document.
Level 3 276 - 325	Texts at this level are often dense or lengthy, and include continuous, non-continuous, mixed, or multiple pages of text. Understanding text and rhetorical structures become more central to successfully completing tasks, especially navigating complex digital texts. Tasks require the respondent to identify, interpret, or evaluate one or more pieces of information, and often require varying levels of inference. Many tasks require the respondent to construct meaning across larger chunks of text or perform multi-step operations in order to identify and formulate responses. Often tasks also demand that the respondent disregard irrelevant or inappropriate content to answer accurately. Competing information is often present, but it is not more prominent than the correct information.
Level 4 326 - 375	Tasks at this level often require respondents to perform multiple-step operations to integrate, interpret, or synthesize information from complex or lengthy continuous, non-continuous, mixed, or multiple type texts. Complex inferences and application of background knowledge may be needed to perform the task successfully. Many tasks require identifying and understanding one or more specific, non-central idea(s) in the text in order to interpret or evaluate subtle evidence-claim or persuasive discourse relationships. Conditional information is frequently present in tasks at this level and must be taken into consideration by the respondent. Competing information is present and sometimes seemingly as prominent as correct information.
Level 5 376 - 500	At this level, tasks may require the respondent to search for and integrate information across multiple, dense texts; construct syntheses of similar and contrasting ideas or points of view; or evaluate evidence based arguments. Application and evaluation of logical and conceptual models of ideas may be required to accomplish tasks. Evaluating reliability of evidentiary sources and selecting key information is frequently a requirement. Tasks often require respondents to be aware of subtle, rhetorical cues and to make high-level inferences or use specialized background knowledge.

Items that exemplify the pertinent features of the proficiency levels in the domain of literacy are described below. In order to be consistent with the OECD international report, Levels 4 and 5 are combined in the figures in this report (Level 4/5).

Below Level 1: Election results (Item ID: C302BC02) Difficulty score: 162

The stimulus consists of a short report of the results of a union election containing several brief paragraphs and a simple table identifying the three candidates in the election and the number of votes they received. The test-taker is asked to identify which candidate received the fewest votes. He or she needs to compare the number of votes that the three candidates received and identify the name of the candidate who received the fewest votes. The word "votes" appears in both the question and in the table and nowhere else in the text.

Level 1: Generic medicine (Item ID: C309A321) Difficulty score: 219

The stimulus is a short newspaper article entitled "Generic medicines: Not for the Swiss". It has two paragraphs and a table in the middle displaying the market share of generic medicines in 14 European countries and the United States. The test-taker is asked to determine the number of countries in which the generic drug market accounts for 10 percent or more of total drug sales. The test-taker has to count the number of countries with a market share greater than 10 percent. The percentages are sorted in descending order to facilitate the search. The phrase "drug sales", however, does not appear in the text; therefore, the test-taker needs to understand that "market share" is a synonym for "drug sales" in order to answer the question.

Level 2: Lakeside fun run (Item ID: C322P002) Difficulty score: 240

The stimulus is a simulated website containing information about the annual fun run/walk organized by the Lakeside community club. The test-taker is first directed to a page with several links, including "Contact Us" and "FAQs". He or she is then asked to identify the link providing the phone number of organizers of the event. In order to answer this item correctly, the test-taker needs to click on the link "Contact Us". This requires navigating through a digital text and some understanding of web conventions. While this task might be fairly simple for test-takers familiar with web-based texts, some respondents less familiar with web-based texts would need to make some inferences to identify the correct link.

Level 3: Library search (Item ID: C323P003) Difficulty score: 289

This task uses the same stimulus as the previous example. The test-taker is asked to identify the name of the author of a book called Ecomyth. To complete the task, the test-taker has to scroll through a list of bibliographic entries and find the name of the author specified under the book title. In addition to scrolling, the test-taker must be able to access the second page where Ecomyth is located by either clicking the page number (2) or the word "next". There is considerable irrelevant information in each entry to this particular task, which adds to the complexity of the task.

Level 4: Library search (Item ID: C323P002) Difficulty score: 348

The stimulus displays results from a bibliographic search from a simulated library website. The test-taker is asked to identify a book suggesting that the claims made both for and against genetically modified foods are unreliable. He or she needs to read the title and the description of each book in each of the entries reporting the results of the bibliographic search in order to identify the correct book. Many pieces of distracting information are present. The information that the relevant book suggests that the claims for and against genetically modified foods are unreliable must be inferred from the truncated Internet search result stating that the author

"describes how both sides in this hotly contested debate have manufactured propaganda, tried to dupe the public and...[text ends with ellipsis as shown]".

PIAAC Proficiency Levels for Numeracy

Achievement level and score range	Task descriptions
Below Level 1 0 - 175	Tasks at this level require the respondents to carry out simple processes such as counting, sorting, performing basic arithmetic operations with whole numbers or money, or recognizing common spatial representations in concrete, familiar contexts where the mathematical content is explicit with little or no text or distractors.
Level 1 176 - 225	Tasks at this level require the respondent to carry out basic mathematical processes in common, concrete contexts where the mathematical content is explicit with little text and minimal distractors. Tasks usually require one-step or simple processes involving counting, sorting, performing basic arithmetic operations, understanding simple percents such as 50%, and locating and identifying elements of simple or common graphical or spatial representations.
Level 2 226 - 275	Tasks at this level require the respondent to identify and act on mathematical information and ideas embedded in a range of common contexts where the mathematical content is fairly explicit or visual with relatively few distractors. Tasks tend to require the application of two or more steps or processes involving calculation with whole numbers and common decimals, percents and fractions; simple measurement and spatial representation; estimation; and interpretation of relatively simple data and statistics in texts, tables and graphs.
Level 3 276 - 325	Tasks at this level require the respondent to understand mathematical information that may be less explicit, embedded in contexts that are not always familiar and represented in more complex ways. Tasks require several steps and may involve the choice of problem-solving strategies and relevant processes. Tasks tend to require the application of number sense and spatial sense; recognizing and working with mathematical relationships, patterns, and proportions expressed in verbal or numerical form; and interpretation and basic analysis of data and statistics in texts, tables and graphs.
Level 4 326 - 375	Tasks at this level require the respondent to understand a broad range of mathematical information that may be complex, abstract or embedded in unfamiliar contexts. These tasks involve undertaking multiple steps and choosing relevant problem-solving strategies and processes. Tasks tend to require analysis and more complex reasoning about quantities and data; statistics and chance; spatial relationships; and change, proportions and formulas. Tasks at this level may also require understanding arguments or communicating well-reasoned explanations for answers or choices.
Level 5 376 - 500	Tasks at this level require the respondent to understand complex representations and abstract and formal mathematical and statistical ideas, possibly embedded in complex texts. Respondents may have to integrate multiple types of mathematical information where considerable translation or interpretation is required; draw inferences; develop or work with mathematical arguments or models; and justify, evaluate and critically reflect upon solutions or choices.

Items that exemplify the pertinent features of the proficiency levels in the domain of numeracy are described below. In order to be consistent with the OECD international report, Levels 4 and 5 are combined in the figures in this report (Level 4/5). No items mapped at Level 5 in numeracy.

Below Level 1: Price tag (Item ID: C602A501) Difficulty score: 168

The stimulus for this item consists of four supermarket price tags. These identify the product, the price per pound, the net weight, the date packed and the total price. The test-taker is asked to indicate the item that was packed first by simply comparing the dates on the price tags.

Level 1: Candles (Item ID: C615A602) Difficulty score: 221

The stimulus for this item consists of a photo of a box containing tea light candles. The packaging identifies the product (tea light candles), the number of candles in the box (105 candles) and its weight. While the packaging partially covers the top layer of candles, it can be seen that the candles are packed in five rows of seven candles each. The instructions inform the test-taker that there are 105 candles in a box and asks him or her to calculate how many layers of tea light candles are packed in the box.

Level 2: Logbook (Item ID: C613A520) Difficulty score: 250

The stimulus for this item consists of a page from a motor vehicle logbook with columns for the date of the trip (start and finish), the purpose of the trip, the odometer reading (start and finish), the distance travelled, the date of entry and the driver's name and signature. For the first date of travel (June 5), the column for the distance travelled is completed. The instructions inform the test-taker that "a salesman drives his own car and must keep a record of the miles he travels in a Motor Vehicle Log. When he travels, his employer pays him \$0.35 per mile plus \$40.00 per day for various costs such as meals." The test-taker is asked to calculate how much he will be paid for the trip on June 5.

Level 3: Package (Item ID: C657P001) Difficulty score: 315

The stimulus for this item consists of an illustration of a box constructed from folded cardboard. The dimensions of the cardboard base are identified. The test-taker is asked to identify which plan best represents the assembled box out of four plans presented in the stimulus.

Level 4: Education level (Item ID: C632P001) Difficulty score: 354

The stimulus for this item consists of two stacked-column bar graphs presenting the distribution of the Mexican population by years of schooling for men and women separately. The y-axis of each of the graphs is labeled "percentage" with 6 grid lines labeled "0%", "20%", "40%", "60%", "80%", and "100%". The x-axis is labeled "year" and data are presented for 1960, 1970, 1990, 2000, and 2005. A legend identifies three categories of schooling: "more than 6 years of schooling", "up to 6 years of schooling", and "no schooling". The test-taker is asked to approximate what percentage of men in Mexico had more than 6 years of schooling in 1970, choosing from a pull-down menu that has 10 response categories: "0-10%", "10-20%", and so on.

Endnotes

- ¹ See *Dictionary.com*, s.v. "education," <http://www.dictionary.com/browse/education?s=t>, and *Study Lectures Notes*, <http://www.studylecturenotes.com/foundation-of-education/etymological-meaning-of-education>; see also *Annual Report of the Board of Education*, Vol. 38, 1873-1874, <https://books.google.com/books?id=E5AXAAAYAAJ&pg=PA202&lpg=PA202&dq=education+etymology+mature+life&source=bl&ots=OKAJKBySgv&sig=75Q0ceJPNq-SSwN1IDPf9JNbWEw&hl=en&sa=X&ved=0ahUKEWiYmviEoLbTAhXD6iYKHfvXAVYQ6AEIqJAF#v=onepage&q=education%20etymology%20mature%20life&f=false>.
- ² "Disconnected youth" are sometimes referred to as the NEET population: "Not in Education, Employment, or Training."
- ³ Kristen Lewis and Sarah Burd-Sharps, *Halve the Gap by 2030: Youth Disconnection in America's Cities*, Measure of America (2013), <http://ssrc-static.s3.amazonaws.com/moa/MOA-Halve-the-Gap-ALL-10.25.13.pdf>.
- ⁴ For purposes of this report, "low skills" includes those who perform at the lowest proficiency levels on the Programme for the International Assessment of Adult Competencies (PIAAC), defined as at Level 2 or at or below Level 1. For more details, see the "Understanding PIAAC" section of this report. When making comparisons, we report on these two subgroups of low skilled adults and compare them to those scoring at or above Level 3. For more details, see the "Understanding PIAAC" section of this report.
- ⁵ See, for example, the September 2016 Memorandum of Decision: Honorable Thomas G. Moukawsher: Connecticut Coalition for Justice in Education Funding Inc., et al. v. Docket, Superior Court, Judicial District of Hartford, <https://assets.documentcloud.org/documents/3100630/School-Funding-Decision.pdf>; Jacqueline Rabe Thomas, "What Does a High School Diploma Prove?," *CT Mirror*, December 13, 2016, <https://ctmirror.org/2016/12/13/troubled-schools-on-trial-what-does-a-high-school-diploma-prove/>; U.S. Accountability Office, *Better Use of Information Could Help Agencies Identify Disparities and Address Racial Discrimination* (GAO-16-345), Washington, DC: US Government Printing Office, 2016; Greg J. Duncan and Richard J. Murnane, "Rising Inequality in Family Incomes and Children's Educational Outcomes," *RSF: The Russell Sage Foundation Journal of the Social Sciences* 2, no. 2 (2016): 142-158, <http://www.rsffournal.org/doi/full/10.7758/RSF.2016.2.2.06>; Organisation for Economic Co-operation and Development (OECD), *In It Together: Why Less Inequality Benefits All* (Paris: OECD Publishing, 2015), <http://dx.doi.org/10.1787/9789264235120-en>.
- ⁶ Irwin Kirsch, Henry Braun, Mary Louise Lennon, and Anita Sands, *Choosing our Future: A Story of Opportunity in America* (Princeton, NJ: Educational Testing Service, 2016); Irwin Kirsch, Henry Braun, Kentaro Yamamoto, and Andrew Sum, *America's Perfect Storm: Three Forces Changing Our Nation's Future* (Princeton, NJ: Educational Testing Service, 2007).
- ⁷ Thomas Piketty and Emmanuel Saez, "Income Inequality in the United States: 1913-1998," *Quarterly Journal of Economics* 118, no. 1 (2003), or, for a less technical summary, see Saez's latest update: *Striking it Richer: The Evolution of Top Incomes in the United States* (2015), <https://eml.berkeley.edu/~saez/saez-UStopincomes-2015.pdf>.
- ⁸ Theodore Roosevelt speech, Chicago, IL, June 17, 1912.
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³⁴ In addition to 24 nations in Round 1, an additional 9 nations were added for PIAAC Round 2 in 2014: Chile, Greece, Indonesia, Israel, Lithuania, New Zealand, Singapore, Slovenia, and Turkey. For more details on participating countries, see <https://nces.ed.gov/surveys/piaac/countries.asp>.

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³⁶ A supplemental round of data collection in the United States was conducted in 2014. The data used herein are based primarily on the combined samples of the U.S. PIAAC household data from 2012 and 2014.

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³⁸ *OECD Skills Outlook 2013*.

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⁴² See the IEA Data Repository, <http://www.iea.nl/our-data>.

⁴³ Results, sample items, access to online tools, and other information regarding the U.S. administration of the PIAAC

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