DOCUMENT RESUME

ED 472 136 UD 035 428

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TITLE The Twin Challenges of Mediocrity and Inequality: Literacy in the U.S. from an International Perspective.

INSTITUTION Educational Testing Service, Washington, DC.
PUB DATE 2002-02-00
NOTE 45p.
AVAILABLE FROM Policy Information Center, Mail Stop 04-R, Educational Testing Service, Rosedale Road, Princeton, NJ 08541-0001 ($15). Tel: 609-734-5694; e-mail: pic@ets.org; Web site: http://www.ets.org/ research/pic.
PUB TYPE Numerical/Quantitative Data (110) -- Reports - Descriptive (141)
EDRS PRICE EDRS Price MF01/PC02 Plus Postage.
DESCRIPTORS *Adult Literacy; *Basic Skills; Educational Attainment; *English (Second Language); Foreign Countries; *Language Proficiency; Minority Groups; *Racial Differences; Reading Skills

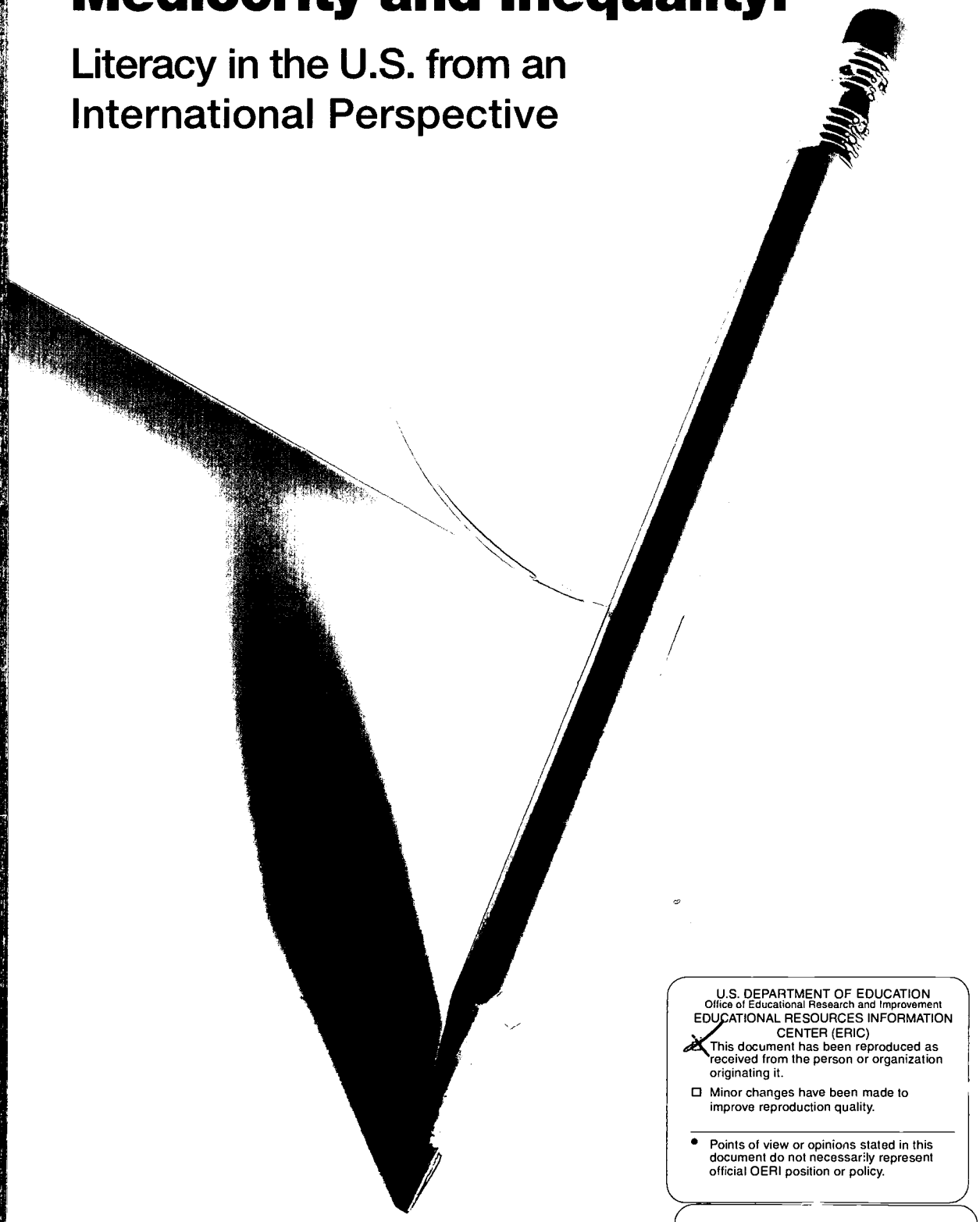
ABSTRACT

This monograph focuses on the literacy performance of U.S. adults in comparison to adults in other high-income countries, underscoring the fact that the overall U.S. performance is mediocre at best and that the U.S. is a world leader in the degree of inequality between the best and poorest performers. The monograph describes the National and the International Adult Literacy Surveys, explaining three literacy measures (prose, document, and quantitative) that are used to characterize adults' literacy proficiencies. The monograph's six sections examine "The National and International Adult Literacy Surveys"; "Comparing U.S. Literacy Proficiency with That of All High-Income Countries"; "The Literacy Proficiency of Key Demographic Subgroups in the U.S." (by gender, age, educational attainment, race/ethnicity, and native born versus foreign born status); "Inequality of Literacy Skills among U.S. Adults"; "The Future Outlook for Inequality among U.S. Adults"; and "Summary of Findings and Policy Recommendations. Four tables are appended. (SM)

POLICY INFORMATION REPORT

The Twin Challenges of Mediocrity and Inequality:

Literacy in the U.S. from an International Perspective



ETS
Educational Testing Service

Statistics and Research Division
Center For Global Assessment

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Published by:
Policy Information Center
Educational Testing Service

The views expressed in this report are those of the authors and do not necessarily reflect the views of the officers and trustees of Educational Testing Service.

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February 2002

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Irwin S. Kirsch is a Senior Research Director and Director of the Center for Global Assessment at Educational Testing Service. Since joining ETS in 1984, he has directed a number of large-scale assessments including the first International Adult Literacy Survey. Other large-scale assessments include the National Adult Literacy Survey, the DOL Workplace Literacy Assessment, and the NAEP Young Adult Literacy Survey. In 1987, he received the ETS Research Scientist Award for his work in this area and was recently named as an ETS Distinguished Presidential Appointee. Selected publications in the area of literacy include: The Framework Used in Developing and Interpreting the International Adult Literacy Survey, *European Journal of Psychology in Education* (in press); Literacy in America: A Brief Overview of the NALS, in *Literacy for the 21st Century: Research, Policy, Practices and the National Adult Literacy Survey,* M. Cecil Smith (Ed.) (Praeger, 1998); A New Measure for Assessing Document Complexity: The PMOSE/IKIRSCH Document Readability Formula, with P. Mosenthal, *Journal of Adolescent & Adult Literacy,* 41:8 (May 1998); *Adult Basic Skills: Innovations in Measurement and Policy Analysis*, with A. Tuijnmanand and D. Wagner (Eds.) (Hampton Press, 1997); Toward an Explanatory Model of Document Literacy, with P. B. Mosenthal, *Discourse Processes,* 14, pp. 147-180 (1991); Exploring Document Literacy: Variables Underlying the Performance of Young Adults, with P. B. Mosenthal, *Reading Research Quarterly,* 25(1), pp. 5-30 (1990); and Measuring Adult Literacy, in *Toward Defining Literacy*, R. L. Venezky, D. A. Wagner and B. S. Ciliberti (Eds.) (International Reading Association, 1990).

Robert Taggart is president of the nonprofit Remediation and Training Institute. A believer in a *"nuts and bolts"* approach, Dr. Taggart developed the nationally-recognized extralearning system with Ford Foundation support. This is a low-cost, public-use system for delivering individualized self-paced, competency-based instruction covering K-12 academics and all functional skills. Using a franchising model, hundreds of extralearning centers have been established in regular and alternative schools, colleges, job training programs, housing projects, corrections and welfare agencies, community-based organizations, and private sector workplaces thoughout the U.S. and internationally. Dr. Taggart has authored 20 books and monographs on diverse topics including the status of minorities, job training strategies, the importance of basic skills, the effectiveness of Great Society programs, labor market statistics, housing and corrections programs, private sector pensions, jobs for the disabled, economic development, and electronic benefits transfer. He headed the Carter Administration's multi-billion dollar youth employment and education initiatives, for which he authored policy statements, monographs, and legislative recommendations that promoted the interests of disadvantaged and minority groups, particularly youth. Through his leadership, over 100 multisite demonstration projects were initiated during the Carter years including tests of national service, apprenticeship in school, school-to-work transition, and youth enterprises.

Preface

It is generally believed that the primary reason for developing and conducting large-scale assessments is to provide empirically grounded interpretations that can be used to inform policy decisions. This places surveys such as the National Adult Literacy Survey (NALS) and the International Adult Literacy Survey (IALS) in the context of policy research. In their classic volume on this topic, Lerner and Lasswell argued that the appropriate role for policy research is not to define policy; rather, it is to establish a body of evidence from which informed judgments can be made.[1] Most large-scale assessments, however, focus on producing lengthy statistical reports that either present the data or describe what was done operationally or psychometrically but offer little in the way of interpretations of what the findings may mean.

Up until the end of the 1990s, comparable information on the literacy proficiencies of the U.S. adult population and their counterparts in other high-income countries around the world was quite limited. Most of the national and international findings were based on surveys of students in primary or secondary schools. This changed with the conduct of the NALS and IALS during the 1990s. Interestingly, the NALS and IALS data are becoming available at a time when the role of human capital in influencing the fate of individuals and nations is receiving increased attention. According to a recent report released by the OECD, research shows that the development of human capital is correlated with better health, lower crime, political and community participation, and social cohesion.[2] Some studies, they report, even suggest that the social impacts of acquiring these knowledge and skills could be as large as their impacts on economic productivity.

This monograph and others planned for this series are an attempt to take the rich background and test information that has been collected through NALS and IALS and produce a set of papers that deal with topics of interest and importance to a range of constituencies. This first report focuses on the performance of U.S. adults in comparison to adults in other high-income countries, underscoring the fact that our overall performance is mediocre at best and that as a nation we are among the world's leaders in the degree of inequality between our best and poorest performers. This report also offers a perspective on why these results should concern us as a nation.

ETS's goal in publishing this series is to call attention to important findings from these national and international literacy surveys and their implications in terms of our educational and workforce development policies. While we do not pretend to have answers to all the challenges we expect will be raised in these reports, our hope is that this series will contribute to a lively debate and help to inform the policymakers who must confront these issues.

As Thomas Jefferson noted more than 200 years ago, literacy and education are fundamental to our democracy. His observation is perhaps more true today than it was earlier in our history. While our society will not collapse today or even tomorrow from the uneven distribution of skills we currently see in America, our nation risks falling behind in international competitiveness and becoming more divided along social and economic lines. Those with below-average skills cannot hope to earn above-average wages in an increasingly global economy. Moreover, as information and technology continue to grow in importance, and as our economic competitors continue to invest in human capital, even adults in this country with average skills may find it increasingly difficult to get good jobs and understand the many complex issues facing our society. We must find ways of raising our overall levels of literacy and of reducing the high degree of inequality in skills we see in both our adult and student populations. The need to understand the importance of these findings is critical, and the time to act is now.

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Acknowledgments

The authors would like to thank the following people for their help in reviewing this manuscript and for their thoughtful suggestions and corrections: Paul Barton, Henry Braun, John Comings, Julie Eastland, Drew Gitomer, Scott Murray, and Kentaro Yamamoto. We also wish to thank Stan Jones for sharing his thoughts and interpretations of the Canadian findings from IALS.

Kentaro Yamamoto and Minhwei Wang conducted all the analyses presented in this monograph. We thank them for their prompt responses to our many requests and for their thoughtful suggestions to our initial ideas.

Lynn Jenkins provided editing support for the manuscript. Sheila Palma and Lilli Gonzelez assisted us with word processing, and Carla Cooper had responsibility for composition.

Funding for this report was provided by the Research Division of Educational Testing Service. While we are appreciative of the many individuals that contributed to this manuscript, the views expressed here are those of the authors and do not necessarily reflect the thoughts or opinions of the officers and trustees of Educational Testing Service.

Introduction

Over the past decade, the role of core academic proficiencies in influencing the economic fate of individuals and nations around the world has received increased attention from educators, economists, workforce development specialists, and public policymakers.[3] Until the 1990s, however, little information was available on the literacy proficiencies of the entire U.S. adult population and their counterparts in other countries around the world. Most national and international findings were based on assessments of students in elementary and secondary schools. The 1990s, however, witnessed the implementation of two large-scale studies of adult literacy. The National Adult Literacy Survey, conducted in 1992, was the largest household-based literacy assessment ever conducted in the U.S. and involved a representative sample of U.S. adults (16 and older). The International Adult Literacy Survey, conducted from 1994 to 1998, examined the proficiencies of the adult population in 23 different countries, including the United States.[4]

The joint availability of the NALS and IALS assessment data at the end of the decade provides a unique opportunity to compare both the distributions and average literacy proficiencies of adults in the U.S. with those of adults in other high-income countries around the world and to test the validity of earlier hypotheses about U.S. comparative performance. This research monograph will present the findings of our analyses of the comparative performance of U.S. adults on these literacy assessments.

The title of this monograph captures our two main findings: First, the average literacy scores of U.S. adults on the NALS and IALS assessments are quite modest; the mean scores of U.S. adults on each literacy scale are at best average with respect to their international peers and, for a number of key subgroups, the U.S. ranks in the bottom half of the distribution for high-income countries. Second, the general mediocrity of U.S. adults' literacy skills overall is accompanied by a high degree of inequality in the distribution of literacy skills, both in an absolute sense and in comparison to most of the other high-income countries that participated in the IALS assessment. These twin findings of mediocrity and inequality foreshadow a number of important challenges to the U.S. educational and workforce development systems in the years ahead.

The patterns that we observe in the NALS and IALS databases would not be so alarming if literacy proficiencies were not so strongly associated with social, educational, and economic outcomes in our society. Although education increases one's literacy skill, these skills play a critical role in determining educational success. Specifically, young adults' basic academic skills influence the types of courses they take in high school, the amount of homework they do, whether they graduate from high school or obtain a GED certificate, whether they attend college upon graduation, their choice of major field of study, their persistence in college, and the types of academic degrees they obtain.[5]

The labor markets in which adults in the U.S. participate today have been markedly changed from those of earlier decades by the forces of globalization, technological change, deregulation, industrial and corporate restructuring, and increased domestic competition. Changes in the structure of jobs by occupation and industry and in accompanying job duties have increased the demands for better-educated and more literate workers with stronger communication and critical thinking skills.[6] The cumulative impacts of these changes in the job market have increased the economic premiums associated with formal schooling, literacy proficiencies, and technical skills.[7] Adults with stronger proficiencies are more likely to participate in the labor market, avoid unemployment when they do seek work, gain access to more highly skilled and higher wage occupations, obtain training and education from their employers, and receive higher weekly and annual earnings from their jobs.

Conversely, the lack of formal schooling and a solid base of literacy skills places adults at a considerably higher risk of poverty and economic dependency today in the U.S. and other high-income countries around the world.[8] The poverty conditions of such families have a number of adverse consequences for the cognitive, health, nutrition, and social development of their children, which will place them at a severe disadvantage in school and in the labor markets of the future. The literacy proficiencies of the nation's adults also influence their civic, community, and political behavior.[9] Adults with limited literacy proficiencies are less likely to take the steps needed to improve their awareness and knowledge of civic and political issues, are less likely to take part in civic and community activities including volunteering, and are less likely to vote in local, state, and national elections. The economic, civic, political, and social fabric of our nation would be strengthened by a sustained rise in literacy achievement coupled with a reduction in the size of the gaps that exist between our best and our worst performers.[10]

This monograph provides information that supports our views about the mediocrity and inequality of literacy skills in the U.S. The first section provides a brief overview of the 1992 National Adult Literacy Survey (NALS) in the U.S. and of the International Adult Literacy Survey (IALS), which was administered in 23 countries over the 1994-98 period. Included in this overview is a short description of the three literacy measures (prose, document, and quantitative) used to characterize the literacy proficiencies of adults in both assessments as well as a composite measure that combines performance across the three scales.

The second section compares the mean proficiencies of U.S. adults on each of these four scales with those of adults in all high-income countries participating in the IALS assessment. Further, it identifies the U.S. rankings among all high-income countries on these alternative literacy measures. It is rare, however, to glean meaningful policy information by looking only at aggregate data.

The third section, therefore, begins to disaggregate the overall literacy performance by examining the literacy proficiencies of selected demographic groups of adults in the U.S. (gender, age, nativity, schooling, and race/ethnicity) and comparing their performance to that of their demographic counterparts in other high-income countries. These findings are an attempt to understand better the sources of variability that exist in our adult population and to alert policy makers to issues that may need to be addressed.

The fourth section compares the degree of inequality in the U.S. literacy distribution with that of other high-income countries, using alternative measures of dispersion including standard deviations and the size of the gaps between the proficiencies of adults at various percentiles along the distribution, including the 90th and 10th percentiles. The fifth section examines the future outlook for inequality in U.S. adult literacy by analyzing school-age assessment results in reading, math, and science.

The final section of the paper summarizes our findings and places them in a broader context by considering what they may mean for various constituencies. It also provides some recommendations for the types of incentives and programs that may help to improve future adult literacy in this country.

The National and International Adult Literacy Surveys

In 1992, the National Adult Literacy Survey (NALS) was undertaken in the U.S. by the Educational Testing Service (ETS) for the U.S. Department of Education.[11] The NALS survey was the largest and most comprehensive assessment of the literacy proficiencies of the nation's entire adult population (16 and older). Many of the literacy concepts and measures underlying the NALS were originally developed by ETS in two earlier national assessments of the nation's young adult population (21-25 years old) and of unemployed and economically disadvantaged adults served by unemployment insurance and employment and training programs funded by the U.S. Department of Labor.[12] The NALS assessment provided information on the literacy proficiencies of a sample of 26,091 adults 16 and older, including a sample of 1,147 adults in federal and state prisons as well as supplemental samples from 12 states yielding state representative samples.[13] In addition to assessing participants' literacy skills, the NALS gathered extensive background information on their demographic and socioeconomic characteristics (e.g., their nativity status, schooling, labor force status, income) as well as on their literacy practices.

Following upon the NALS, a pioneering effort was undertaken to develop and conduct the first-ever comparative, international assessment of adult literacy. This assessment effort became known as the International Adult Literacy Survey (IALS) and involved the joint efforts of participating national governments, their statistical agencies and research bureaus, and the Organisation for Economic Co-operation and Development (OECD), and the technical support of Statistics Canada, Educational Testing Service, and the National Center for Education Statistics in the U.S. Department of Education.[14] As with the NALS, a comprehensive background questionnaire in the IALS assessment captured information on respondents' demographic and socioeconomic characteristics.

The international assessments took place in three stages, beginning in 1994 and continuing through 1998. A total of 23 nations took part in the IALS project; most were in North America and Western Europe, but others included Australia, several Eastern European countries (the Czech Republic, Hungary, Slovenia, Poland), New Zealand, and Chile (Table 1). In Canada, Switzerland, and Norway, multiple language versions of the assessment were administered. In most countries, the universe consisted of adults in the 16-65 age group who were not living in institutions (jails, prisons, nursing homes) or homeless.[15] The number of 16-65 year old sample respondents in these 23 countries ranged from a low of 1,239 in Portugal to a high of 8,204 in Australia.[16] After reviewing several approaches to measuring literacy, the original participating countries decided to adopt the definition and framework for measuring literacy that was used in NALS. Literacy was defined as:

> *Using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential.*

In operationalizing this definition, the IALS assessment measured respondents' proficiencies along three literacy scales: prose, document, and quantitative. Each scale was constructed to range from 0 to 500. A brief description of the tasks and skills underlying each of the three literacy scales is presented below.

Prose literacy - the knowledge and skills needed to understand and use information from texts that include editorials, news stories, poems, and fiction; for example, finding a piece of information in a newspaper article, interpreting instructions from a warranty, inferring a theme from a poem, or contrasting views expressed in an editorial.

Document literacy - the knowledge and skills required to locate and use information contained in materials that include job applications, payroll forms, transportation schedules, maps, tables, and graphs; for example, locating a particular intersection on a street map, using a schedule to choose the appropriate bus, or entering information on an application form.

Table 1:

Alphabetical Listing of the 23 Countries Participating in the International Adult Literacy Study (IALS)

Australia	Italy
Belgium (Flanders)	Netherlands
Canada	New Zealand
Chile	Northern Ireland
Czech Republic	Norway
Denmark	Poland
Finland	Portugal
France	Slovenia
Germany	Sweden
Great Britain	Switzerland
Hungary	United States
Ireland	

Language Groups for Which Separate Assessments Were Undertaken in Selected Countries

Canada
- (English)
- (French)

Norway
- (Bokmal)
- (Nynorsk)

Switzerland
- (French)
- (German)
- (Italian)

Quantitative literacy - the knowledge and skills required to apply arithmetic operations, either alone or sequentially, using numbers embedded in printed materials; for example, balancing a checkbook, figuring out a tip, completing an order form, or determining the amount of interest from a loan advertisement.

The estimated proficiencies of respondents on the three literacy scales were also combined to produce a composite proficiency score. A simple average of the estimated prose, document, and quantitative scores was used to represent the composite proficiency.[17]

Comparing U.S. Literacy Proficiency with That of All High-Income Countries

In using the IALS data to compare the literacy proficiencies of U.S. adults with those of adults in other countries, we confined our analyses in this report to higher income countries—that is, countries in which the per capita gross domestic product (GDP) is similar to that in the U.S.[18] The six countries excluded from the analysis were Chile, the Czech Republic, Hungary, Poland, Portugal, and Slovenia. The mean scores of the respondents in each high-income country, including separate language breakouts for Canada and Switzerland, were weighted by their share of the combined nonelderly adult population (16-65 years old) in these "20 country groups" to generate weighted mean scores for the prose, document, quantitative, and composite scales. An alphabetical listing of the 20 high-income countries/language groups included in the analysis can be found in Appendix A.

The mean literacy scores of U.S. adults on each of the four scales were then compared to that of all adults in the 20 high-income countries.[19] These findings, together with t-tests of the statistical significance of the differences between the mean proficiencies and the U.S. ranking among the 20 countries on each scale, are displayed in Table 2.[20]

The mean prose score of U.S. adults was 273, which is 6 points above the weighted mean prose score for all adults in the high-income countries; this difference is statistically significant at the .01 level. The U.S., however, only ranked 9th highest among the 20 countries on the prose scale. On the document scale, the mean score of U.S. adults (267) was statistically identical to the mean for all adults in the high-income countries. On this scale, the U.S. ranked 14th among the 20 countries. On the quantitative scale, the mean score of U.S. adults (274) was not statistically different from the mean for adults in all of the countries combined. The U.S. ranking on the quantitative scale was 13th highest.

On the composite scale, the mean score of the U.S. (272) was 2.4 points above the weighted mean for all adults in high-income countries, but this difference was not large enough to be classified as statistically significant at the .05 level. The U.S only ranked 12th among the 20 countries on this composite literacy scale.

In a separate analysis, we combined the composite proficiency scales for the separate language groups in Canada and Switzerland to form separate national estimates for these two countries. In this analysis, which included only 17 countries (see Appendix B for a list), nine countries had higher mean composite scores than the U.S, as shown in Table 3. The absolute sizes of the differences between the mean composite scores of the U.S. and each of these nine countries are presented, together with findings of their statistical significance. The sizes of the differences in mean composite scores ranged from 2 points to 32 points, and seven of the differences were large enough to be classified as statistically significant. Six of these differences were equivalent to approximately one-fifth to one-half of a standard deviation above the mean composite score of the U.S.[21]

At best, the performance of all U.S. adults on the IALS assessment can be described as "average" for the participating high-income countries. Only on the prose scale was the U.S. score significantly higher than the mean for all high-income countries, but even here the U.S. ranked 9th highest among the 20 high-income countries. On none of the four literacy measures was the U.S. a world leader, and on each of the scales the average proficiency of the U.S. was approximately one-third to one-half of a standard deviation below the two international front runners (Sweden and Norway). In this report, we refer to the average to below average performance of U.S. adults when compared with other high-income countries participating in IALS as mediocre.

Table 2:

Comparisons of the Weighted Mean Scores of Adults in the U.S. and All High-Income Countries on the Prose, Document, Quantitative, and Composite Scales, and the U.S. Rank Among the 20 IALS Country Groups

Scale	(A) U.S.	(B) All High Income Countries	(C) Differences (A-B)	(D) Sig. of Differences	(E) U.S. Rank
Prose	273	267	+6	.01	9th
Document	267	267	0	Not Sig.	14th
Quantitative	274	272	+2	Not Sig.	13th
Composite	272	270	+2	Not Sig.	12th

Note: The age range represented in this and other tables throughout the report is 16-65, unless indicated otherwise.

Table 3:

Nine IALS High-Income Countries with Mean Composite Scores Higher Than Those for the U.S. and the Size and Statistical Significance of the Differences in Mean Scores

Country	(A) Differences in Mean Scores (Country - U.S.)	(B) Ratio of Mean Score Difference to U.S. Standard Deviation	(C) Statistical Significance of Differences
Sweden	+32	.47	Sig. .01
Norway	+22	.32	Sig. .01
Denmark	+17	.25	Sig. .01
Finland	+16	.23	Sig. .01
Netherlands	+14	.20	Sig. .01
Germany	+13	.18	Sig. .01
Canada	+8	.11	Sig. .05
Belgium	+5	.08	Not Sig. .05
Australia	+2	.03	Not Sig. .05

Concerns over the comparatively mediocre literacy performance of U.S. adults are heightened by the amount of dispersion seen in the distribution of literacy skills. This is evident in analyses that compare the percentages of U.S. adults and adults in all high-income countries who performed at various levels of literacy proficiency.

Scores on each of the three literacy scales were characterized in terms of five levels (Table 4), with Level 1 representing the lowest level of proficiency and Level 5 the highest.[22] Respondents scoring in Level 1 or 2 can best be characterized as possessing very limited to limited literacy proficiencies. While few of the adults in Levels 1 or 2 would be considered "illiterate" in the historical meaning of that term (an inability to write one's own name or to read a very simple passage), few have the skills believed to be needed to succeed in today's more technologically sophisticated economy, to gain access to high wage jobs, or to actively participate in civic and political life. For example, adults who scored in the Level 1 to Level 2 range are performing below the average proficiencies of adults who graduated from high school; in fact, those in Level 1 are performing below the average score of adults who dropped out of high school and never earned a diploma or its equivalency.

Table 4:

Range of Scale Scores Corresponding to Each Literacy Level

Level	Score Range
1	0-225
2	226-275
3	276-325
4	326-375
5	376-500

As a result, a number of national and state organizations in the U.S., including the National Governor's Association, have identified Level 3 proficiency as a minimum standard for success in today's labor markets.[23] How well do U.S. adults fare in achieving the Level 3 benchmark? Findings from the IALS assessment (Table 5) indicate that only about half of the U.S. adult population 16-65 years of age reached Level 3. Fifty percent scored below this level (that is, at Level 1 or 2) on the document scale, and 46 to 47

Table 5:

Percent of U.S. Adults With Prose, Document, Quantitative, and Composite Scores in Levels 1 and 2 in the IALS Assessment

	(A)	(B)	(C)
Literacy Scale	Level 1	Level 2	Level 1 + 2
Prose	21	26	47
Document	24	26	50
Quantitative	21	25	46
Composite	20	25	45

Note: The age range represented in this table is 16-65.

percent did so on the prose and quantitative scales. Inclusion of the elderly (those over 65 years of age) in these findings would have reduced the estimated share of the adult population with a Level 3 or better performance. The NALS assessment revealed that 71 to 85 percent of the nation's adults 65 and older had only a Level 1 or 2 proficiency on each of the three literacy scales.[24]

From a comparative point of view, the U.S. ranked near the top of the international list in terms of both the percentages of adults in Level 1 and the percentages in Levels 4 and 5. On the prose scale, for example, the 21 percent of U.S. adults with only a Level 1 proficiency was 6th highest among the 20 high-income countries, and the 24 percent of U.S. adults with a Level 1 proficiency in document skills was 5th highest. At the upper end of the score distributions, the U.S. and Finland tied for 3rd place with respect to the share of adults with a Level 4 or 5 proficiency in prose skills and tied for 6th place with respect to the share of adults with a Level 4 or 5 proficiency in quantitative skills. Thus, as will be discussed at length in a later section of this monograph, the U.S. proficiency distributions on each scale were characterized by a high degree of dispersion, both in an absolute sense and relative to the degree of dispersion found in most of the other high-income countries assessed. The extent of the variability which exists in the U.S. population has implications for the degree of disparity in opportunity or inequality we see in social, educational and labor-market outcomes and, therefore, in the challenges that lie before us.

The Literacy Proficiency of Key Demographic Subgroups in the U.S.

The mediocre overall performance of U.S. adults on the international literacy assessment could stem from a comparatively weak set of literacy skills among selected demographic subgroups. If this is the case, then the attainment of improved literacy proficiencies in the future will require targeted policies aimed at bolstering the literacy skills of those groups identified as lagging behind their counterparts in the U.S. or in other high-income countries. In this section, we examine the comparative literacy performance of selected subgroups of U.S. adults defined in terms of their gender, age, educational attainment, nativity, and race/ethnicity. (Supplemental tables are included in Appendix D.)

Gender. In past workforce development studies, adult women in the U.S. have at times been referred to as an "educationally disadvantaged" group.[25] Do the literacy proficiencies of adult women in the U.S. fall considerably below those of men and, thus, contribute to the low overall average literacy scores of the nation's adults? Findings of the NALS assessment provided little evidence of any substantive net differences in literacy performance between men and women. On the prose scale, the mean score of adult women was statistically identical to that of men, while the mean score of adult men was modestly though significantly higher for the document scale (+4 points) and 11 points higher on the quantitative scale.[26] Among adults who were active participants in the labor market at the time of the NALS, the mean prose score of full-time employed adult women was significantly higher than that of men, the document scores of these two full-time employed groups were identical, and men held a modest 4-point advantage on the quantitative scale.[27] Among part-time workers, women had significantly higher mean prose, document, and quantitative scores than men.

The IALS findings for nonelderly adult men and women are quite similar to those of the NALS for all persons 16 and older (Table 6). In the IALS assessment, women obtained a significantly higher mean prose score (7 points) than men and matched the document skills of adult men, while men had a statistically significant 9-point advantage over women on the quantitative scale. On the composite literacy scale, the mean scores of adult men and women in the U.S. were statistically identical. Accordingly, there is *no gender gap* in the mean overall literacy proficiencies of adult men and women in the U.S. If the nation is to improve its literacy performance in the future, it will have to substantively raise the proficiencies of both men and women.

Table 6:

Mean Prose, Document, Quantitative, and Composite Scores of U.S. Men and Women in the IALS Assessment

Scale	(A) Men	(B) Women	(C) Differences (A-B)	(D) Sig. of Differences
Prose	270	277	-7	Sig. .01
Document	266	268	-2	Not Sig.
Quantitative	279	270	+9	Sig. .01
Composite	272	273	-1	Not Sig.

Table 7:

Mean Composite Scores of Men and Women in the U.S. Compared to All 17 High-Income Countries in the IALS Assessment

Group	(A) U.S.	(B) 17 High-Income Countries	(C) Differences (A-B)	(D) Sig. of Difference	(E) U.S. Rank
Men	272	272	0	Not Sig.	12th
Women	273	268	+5	Sig. .02	9th

How well do men and women in the U.S. perform when compared to those in high-income countries? Table 7 shows that the mean composite literacy score of men in the U.S. was the same as that for men in all of the high-income countries, and the mean score of U.S. men ranked 12th among these 17 countries. American women outperformed their counterparts in the high-income countries by 5 points, a difference that was statistically significant at the .02 level. The U.S. rank for women was 9th highest, exactly in the middle of the distribution of the mean composite test scores for these 17 countries.

These findings can also be looked at in the context of school-aged children in the U.S. For example, the National Assessment of Educational Progress (NAEP) reading assessments revealed considerable gaps between the mean composite reading scores of boys and girls at each grade level in the late 1990s. On the 2000 reading assessment of fourth graders, girls obtained a 10-point higher mean score than boys, while the 1998 reading assessments indicated that girls outperformed boys in the 8th and 12th grade levels by 13 and 15 points, respectively. The 15-point gap between the mean reading scores of female and male 12th graders was equivalent to .4 standard deviations and may be an important underlying cause of the widening gender gaps in college attendance and bachelor degree attainment rates. Women now enroll in college at higher rates than men, remain enrolled at higher rates, and in the late 1990s obtained bachelor degrees at a rate 20 percent above that of men. It would be more accurate today to describe men as the "educationally disadvantaged" group in U.S. society, and the absence of any growth in college attendance rates among 18-24 year old men in the 1990s should be viewed as a major policy concern.

Age. Data presented earlier in this monograph show that average literacy scores for adults in the U.S. are only equal to the averages for adults in all high-income countries who participated in the IALS assessment. Will the nation's standing improve as the older age cohorts in the U.S. are replaced by younger cohorts? Our average literacy scores will rise only if the younger members of the population (those under 35) have better scores than the older age groups, especially those in their preretirement years (56-65). Our comparative international position, however, will improve only if our younger cohorts enjoy substantive literacy advantages over their same-age counterparts in other countries. To analyze the potential impacts of the aging of the U.S. adult population on our country's absolute and comparative literacy position over the next decade, we compared the prose, document, and quantitative proficiencies of selected age subgroups of adults in the

U.S. and other high-income countries.[28] The findings of the 1992 NALS assessment revealed that the average literacy scores of adults in the U.S. grouped by age tended to rise from young adults (16-25), through those in their 40s (26-35 and 36-45), and then decline for older age groups (46-55 and 56-65), partly reflecting the fewer years of formal schooling completed by older adults.[29]

The IALS findings for the U.S. are similar, but not identical, to those from the NALS (Table 8). Mean scores on the prose and quantitative scales peak for the 36-45 age group and then decline with age, being lowest for the nation's oldest adults; i.e., those 56-65 years of age. As these adults age and the oldest cohort retires from the labor market, the average literacy proficiencies of the U.S. labor force should improve modestly.[30] These gains can be expected to continue through 2005. However, the substantial influx of new immigrants into the nation—which historically has been underestimated by the U.S. Census Bureau and the Immigration and Naturalization Service (INS)—will reduce, if not eliminate, any advantages associated with the current aging of the native-born adult population.

From a comparative perspective, the findings in Table 8 are far more pessimistic. Young adults in the U.S. (25 and under, and 26-35) ranked below their international counterparts on each of the three IALS scales. Among the 19 countries for which age data are available, young adults (25 and under) in the U.S. rank 14th on each of the three literacy scales, while U.S. adults in the 26-35 age group rank between 11th and 16th on the three scales. U.S. adults age 35 and under did not rank in the upper half of the score distributions on any of the scales.

All of the proficiency advantages of the U.S. adult population relative to those of other high-income countries are attributable to the performance of those 36 and older, and especially those 46-65, who tended to score in the upper third of the international distribution for their age group. This was due in large part to their higher number of years of formal schooling. Because other high-income countries have invested more in schooling their young adults, they have succeeded in fully closing the gaps in literacy between their younger adults and those of the U.S. In fact, among those adults under 35, the U.S. lags behind the average literacy proficiencies of their peers in these other 18 countries. The U.S. is *no longer* an international leader in average literacy performance among young adults, despite relatively high levels of educational spending.

Young Adults. A separate analysis of the literacy proficiencies of the nation's 20-25 year olds was conducted because they are the most recent products of our schools. This analysis compared the literacy proficiencies of the following three educational subgroups:

- Young adults who did not complete a secondary level of schooling, i.e., lacking a high school diploma;
- youth who completed secondary schooling but no years of college; and
- youth who obtained a four-year college diploma.

The mean prose, document, and quantitative proficiencies of 20-25 year old adults in the U.S. in each of these three educational attainment groups and the percentile ranks of these mean scores along the international score distribution are displayed in Table 9. The U.S. rank among the 14 countries for each educational attainment group and literacy scale is also displayed.[31](See Appendix C for a list of the 14 countries.)

Table 8:

Mean Prose, Document, and Quantitative Scores of U.S. Adults in Selected Age Groups and Their Rank Among 19 Countries in the IALS Assessment

Prose

Age Group	(A) Mean Score	(B) Percentile Rank of Mean Score on IALS Scale	(C) U.S. Rank
16-25*	278	52nd	14th (tie)
26-35	275	50th	11th (tie)
36-45	284	56th	5th
46-55	277	52nd	3rd
56-65	266	44th	2nd

Document

Age Group	(A) Mean Score	(B) Percentile Rank of Mean Score on IALS Scale	(C) U.S. Rank
16-25*	279	52nd	14th (tie)
26-35	272	48th	16th
36-45	276	50th	10th
46-55	268	45th	8th
56-65	254	36th	6th (tie)

Quantitative

Age Group	(A) Mean Score	(B) Percentile Rank of Mean Score on IALS Scale	(C) U.S. Rank
16-25*	275	46th	14th (tie)
26-35	278	48th	13th
36-45	285	53rd	8th
46-55	279	49th	6th (tie)
56-65	268	42nd	5th (tie)

*Findings for this age group are based on NALS data.

Table 9:

Mean Prose, Document, and Quantitative Scores of 20-25 Year Olds in the U.S. Compared to 14-High Income IALS Countries by Level of Schooling Completed

Prose

Years of Schooling	(A) Mean Score	(B) Percentile Rank of Mean Score on IALS Scale	(C) U.S. Rank
Less than 12 years	228	23	14th
12 years	270	47	14th
16 or more years*	313	76	8th

Document

Years of Schooling	(A) Mean Score	(B) Percentile Rank of Mean Score on IALS Scale	(C) U.S. Rank
Less than 12 years	228	23	13th
12 years	272	47	14th
16 or more years*	312	75	11th

Quantitative

Years of Schooling	(A) Mean Score	(B) Percentile Rank of Mean Score on IALS Scale	(C) U.S. Rank
Less than 12 years	222	18	14th
12 years	270	43	14th
16 or more years*	310	71	9th

*Scores for the U.S. are based on the NALS because the IALS did not include interviews of students in college dormitories.

Source: *Literacy in the Information Age*, Table 3-1.

Table 10:

Percentages and Rank of U.S. Adults Compared to 19 IALS Countries by Selected Educational Attainment Group

Years of Schooling	(A) U.S.	(B) All 19 Countries Combined	(C) Difference (A-B)	(D) U.S. Rank
Less than 12 years	18.4	35.9	-17.5	17th
12 years plus	37.1	25.7	+11.4	1st
16 or more years	22.3	15.4	+6.9	1st

Not surprisingly, the mean literacy scores of young adults in the U.S. vary quite substantially by educational attainment, with gaps of 84 to 88 points between the mean scores of four-year college graduates (16+ years) and high-school dropouts (<12 years), equivalent to 1.5 standard deviations.[32]

Further, the comparative findings are quite disappointing. On each of the three scales, young adults in the U.S. who failed to graduate from high school or only obtained a high-school diploma ranked last or second-to-last among the 14 countries included in the analysis. While four-year college graduates in the U.S. obtained mean proficiencies that placed them at the 71st to 76th percentiles on the international scale, their mean scores were in the lower half of the rankings for young college graduates in these 14 countries. All groups of young adults in the U.S. had average proficiencies below those of their counterparts in high-income countries with comparable amounts of schooling.

Educational Attainment. Perhaps the mediocre performance of U.S. adults on the IALS assessment is attributable to weaknesses in the formal educational attainment of U.S. adults relative to their counterparts in the other IALS countries. To address this issue, we examined the background questionnaire data on the educational attainment of adults in 19 IALS countries,[33] classifying them into three categories: those who did not complete a full secondary education, those who completed some post-secondary education, and those who completed four or more years of college. Key findings of the analysis are displayed in Table 10.

The educational attainment of U.S. adults clearly outstripped that of nearly all other countries in each of the three educational attainment categories. Only 18 percent of U.S. adults reported that they failed to complete a secondary education, versus nearly 36 percent of their adult counterparts in the 19 IALS countries. The U.S. rank in this category was 17th—the third lowest. Only Germany and Norway had lower shares of adults with no high school diploma. Further, 37 percent of U.S. adults reported that they had completed some postsecondary schooling, while only 26 percent of adults in the 19 high-income countries did so. The U.S. rank in this category was first. Finally, 22 percent of U.S. adults claimed that they held a bachelor's or higher degree, while only 15 percent of their counterparts in the 19 IALS countries did so. Again, the U.S. ranked first in this category. Our two closest competitors were English-speaking Canada and the Netherlands, where 17 percent of the adults were college graduates.

The findings can be misleading, however, if not understood in the context of the skills that are acquired. The U.S. has been the world leader in postsecondary education, in that many adults pursue some education beyond secondary school and relatively high percentages of adults obtain a four-year or higher degree. Yet, the U.S. does not come close to being a world leader in the literacy skills of its adult population. This implies that U.S. schools are at a competitive disadvantage in imparting proficiencies per year of formal schooling or per dollar invested in students.

Herbert J. Walberg of the University of Illinois at Chicago has discussed similar findings for past and current U.S. students in a review of 33 international studies of U.S. students' test performance and time use.[34] Walberg asks the following question: "How can the most productive country on the planet have the least productive schools?" He attributes the relatively poor performance of U.S. students to substantially less average study time, including time spent studying in regular schools, tutoring schools, and away from school.[35]

To improve our understanding of the comparative performance of U.S. adults in various educational groups on the three literacy scales, we analyzed their mean proficiencies, the percentile rankings of their mean proficiencies, and their rank among these 19 countries. Means and percentile rankings for each educational attainment subgroup and for each scale are displayed in Appendix D.

The international rankings of U.S. adults by educational attainment group on each of the three literacy scales are extremely low for nearly every educational group and every scale. Among those U.S. adults who completed 9-11 years of schooling and those who obtained a high-school diploma but failed to complete any postsecondary schooling, the U.S ranked last or second-to-last on each of the three scales (Table 11). For those adults who completed one to three years of postsecondary schooling, the U.S. ranked near the bottom (15th to 17th place) on each of the three scales. While four-year college graduates in the U.S. obtained considerably higher mean scores than their less educated U.S. counterparts on each of the three scales, they only ranked in the upper half of the

Table 11:

Rank of U.S. Adults' Mean Prose, Document, and Quantitative Scores Among 19 High-Income Countries, by Educational Attainment

	U.S. Rank		
Educational Attainment	Prose Scale	Document Scale	Quantitative Scale
None to primary school only*	14th	16th	15th
Some high school, no diploma or GED certificate	19th	19th	19th
High-school graduate/GED, no college	18th (tie)	19th	19th
1-3 years of college	15th	17th	17th
Bachelor's degree or higher	5th	15th (tie)	13th

*Only 18 countries' data were available for this educational group.

international distribution for all college graduates on one measure: prose literacy. On the document and quantitative scales, the mean scores of U.S. college graduates only ranked 15th and 13th highest, respectively, among the 19 IALS countries.

The comparatively weak literacy performance of U.S. adults in each educational attainment subgroup indicates that the productivity of U.S. schools is below average for each literacy measure. On average, U.S. adults have acquired more years of formal schooling than their IALS counterparts but have not matched their literacy performance for each level of schooling acquired. In only one of the 15 comparisons (the prose scores of four-year college graduates) did the U.S. rank in the upper half of the 19-country distribution, and on nine of these measures, the U.S. ranked last, second to last, or third lowest. Improving the future performance of U.S. adults will clearly require substantial improvements in the literacy-producing potential of U.S. schools at all levels of schooling: primary, secondary, and college.

Native- and Foreign-Born Adults in the U.S. Analyses of the IALS data indicate that the comparatively weak average performance of U.S. adults on the international literacy assessment can been attributed in part to the very weak literacy performance of foreign immigrants, whose numbers have been rising rapidly in the 1990s. At least 40 percent, and perhaps as much as 52 percent, of the net growth in the U.S. resident population during the decade of the 1990s was due to new foreign immigration. Over 40 percent of the growth in the nation's resident civilian labor force was accounted for by new foreign arrivals, i.e., immigrants coming into the United States from 1990 onward.[36] The U.S. in general, and many states in the Northeast region in particular, have become more dependent on foreign immigration for their labor force growth than at any time since the first decade of the 20th century.[37]

There are several reasons why foreign-born adults can be expected to have a greater impact on mean literacy proficiencies in this country than in other countries. First, they account for an above-average share of the adult population in the U.S. relative to the other IALS countries. At the time of the 1994 IALS assessment in the United States, the foreign born were estimated to account for 13 percent of the adult population in this country, the fifth highest proportion among the high-income IALS countries. Only Australia, Canada, New Zealand, and Switzerland had a relatively larger immigrant adult population. Second, many foreign immigrants in the U.S. have limited formal schooling in comparison to their native-born counterparts. In March 2000, one-third of all foreign-born adults 20 years of age and older in the United States had failed to obtain a high-school diploma or its equivalent, versus only 13 percent of native-born adults in the same age group.[38] Third, the vast majority of recent foreign immigrants into the U.S. have arrived from non-English speaking countries and are, thus, often challenged by a combination of limited formal schooling and limited English-language skills. As noted earlier, the IALS assessment in the U.S. was conducted only in English.

Native-born adults in the U.S. obtained a mean composite literacy score that was 8 points above the mean score of their peers in all high-income countries, a difference that was statistically significant at the .01 level, but the U.S. rank was only 10th highest, approximately in the middle of the distribution for these 17 countries (Table 12).[39] Immigrant adults in the U.S. scored very poorly on the composite literacy scale, achieving a mean score of only 210; this was 74 points or 1.4 standard deviations below the mean composite score of native-born adults. The mean composite literacy score of immigrant adults in the U.S. also was 16 points below the mean of all immigrant adults in the high-income countries, a difference that is statistically significant at the .01 level. The mean composite score of foreign-born adults in the U.S. was next to last among the 17 high-income countries.
To understand better the differences in average proficiency between native- and foreign-born adults in the U.S., we subdivided these two groups into two educational categories: those lacking a high-school diploma and those who had earned a high school diploma or more (Table 12). The findings are very disheartening.

Table 12:

Mean Composite Scores of Key Educational Subgroups of Native- and Foreign-Born Adults in the U.S. and All High-Income Countries in the IALS Assessment

Demographic Group	(A) U.S.	(B) 17-High Income Countries	(C) Differences (A-B)	(D) Sig. of Differences	(E) U.S. Rank Among 17 Countries
Native born	284	276	+8	Sig. .01	10th
Foreign born	210	226	-16	Sig. .01	16th
Native born					
High-school dropout	225	243	-18	Sig. .01	15th
High-school graduate or higher	295	294	+ 1	Not Sig.	13th
Foreign born					
High-school dropout	149	177	-28	Sig. .01	16th
High-school graduate or higher	243	258	-15	Sig. .05	17th

Native-born U.S. adults without a high-school diploma performed very poorly on the composite measure, obtaining a mean score of only 225, which is about 70 points below the mean score of native-born U.S. adults having earned at least a high-school diploma (295). This is equivalent to one standard deviation on the composite scale for the total population and approximately 1.5 standard deviations for native-born adults who have earned at least a high-school diploma or its equivalent.

Native-born high-school dropouts in this country also fared considerably less well than their counterparts in other high-income countries. The mean composite test score of U.S. dropouts was 18 points below the mean score of their counterparts in all high-income countries and ranked third lowest or 15th among the 17 high-income countries participating in the IALS. Native-born adults in the U.S. who had graduated from high school had a mean composite literacy score of 295, matching that of adult high-school graduates in the high-income IALS countries. The U.S. ranked only 13th among the 17 countries on this measure of literacy performance, however, falling in the bottom third of the distribution.

Foreign-born adults who failed to obtain a high school diploma in either the U.S. or their home country had a very low mean score (149) on the composite literacy scale, 135 points or some two standard deviations below the mean score of all native-born adults. These poorly educated foreign-born adults performed 28 points below the average for all such adults in the high-income countries, and their mean score ranked next to last among the 17 IALS countries.[40] Foreign-born U.S. adults who had obtained at least a high-school diploma had a mean composite score 95 points above that of their foreign born peers who failed to graduate from high school, but their score was 14 points below the mean composite score of all immigrants with a high-school diploma in the high-income countries, and they ranked last among the 17 countries on this measure of performance.

Table 13:

Mean Prose, Document, and Quantitative Scores of White, Black, and Hispanic Adults (16 and Older) on the NALS Assessment

Scale	(A) White	(B) Black	(C) Hispanic	(D) Difference: White-Black	(E) Difference: White-Hispanic
Prose	280	237	208	+43	+72
Document	280	230	213	+50	+67
Quantitative	287	224	212	+63	+75

Note: These data are from the NALS household survey only.

Given the continued growth in the immigrant population, including undocumented immigrants, the ability of the U.S. to improve the future literacy proficiencies of adults will be partly dependent on the gains achieved by past immigrants in their English-based literacy proficiencies. Improvements in the literacy skills of immigrants also should facilitate their assimilation into U.S. labor markets. Past national and regional labor market research has revealed the importance of a strong base of English speaking, English reading, and overall literacy proficiencies in improving the wages and earnings of immigrant workers in the U.S.[41]

Race/Ethnicity. Another potential source of the restricted literacy proficiencies of U.S. adults is the growing racial and ethnic diversity of the population, given the traditionally more limited literacy proficiencies of racial/ethnic minorities, especially Black and Hispanic adults of whom the latter group also contains a relatively large number of foreign-born individuals. The NALS survey results revealed large gaps between the mean prose, document, and quantitative scores of White, non-Hispanic adults and those of Blacks and Hispanics.[42] The mean scores of all Black adults on each of the three scales were 43 to 63 points below those of Whites, while the White-Hispanic gaps were even larger, ranging from 67 to 75 points (Table 13).

If we adjust the mean NALS scores for U.S. adults under age 65 to exclude all foreign-born adults as well as native-born Blacks and Hispanics, then the mean prose and quantitative scores of the remaining U.S. adults (Asian and White, native-born) would rise to 288, ranking the U.S. second highest—tied with Finland and Norway—on the prose scale and fifth highest on the quantitative scale. (See Appendix E for these data analyses.) The findings clearly suggest that future gains in the comparative, international literacy standing of U.S. adults will require substantial improvements in the literacy proficiencies of Blacks, Hispanics, and the foreign born from all racial/ethnic groups. The applauded multicultural diversity of the U.S. population needs to be accompanied by much greater multicultural uniformity in literacy proficiencies if the national goals of racial/ethnic economic and educational equality are to be achieved.

The need to make concerted new efforts to reduce Black-White and Hispanic-White differences in reading and math is clearly indicated by a review of the national NAEP assessments over the past decade. Since 1992, there have been no reductions in the large gaps

between the mean composite reading scores of White and Black youth and between those of Whites and Hispanics in the 4th and 12th grades. In fact, in most cases, these racial/ethnic gaps in reading proficiencies have increased. Very similar findings apply in the area of math proficiencies for the nation's 4th and 12th graders. The continuation of these large differences in average proficiency in the elementary and secondary schools should be viewed as a major educational policy problem in the U.S. that needs to be effectively addressed if future racial/ethnic inequality in adult literacy is to be reduced.

Inequality of Literacy Skills Among U.S. Adults

Most of the preceding analyses of the comparative literacy proficiencies of U.S. adults have been based on the average (mean) scores of various groups of adults in the U.S. and other high-income countries. This section of the report examines the degree of inequality that exists in the U.S. literacy distributions compared with those of other high-income countries by using alternative measures of dispersion.[43] This knowledge is an important part of our understanding and evaluation of the comparative strengths and limitations of U.S. adults. How well do adults in this country perform at various points along the distribution of literacy skills and how does the degree of inequality in the U.S. test score distribution compare to that of other high-income countries?

To answer the first part of the above question, we identified the composite literacy scores of U.S. adults at selected percentiles of the composite test score distribution for U.S. adults and compared the scores of U.S. adults to those of adults in all high-income countries at the same percentiles on the combined distribution for all high-income countries. Similar findings for the prose, document, and quantitative scales are displayed in a set of tables in Appendix F.

At the 5th and 10th percentiles of the U.S. composite literacy distribution, the scores of U.S. adults were only 133 and 176, respectively (Table 14). Both of these scores were significantly lower than the scores of all adults in high-income countries at the same percentiles of the international composite test score distribution (142 and 185, respectively). The scores of U.S. adults at the 5th and 10th percentiles were third lowest among the 17 high-income countries being compared.[44] The bottom 10 percent of adults in the U.S.

Table 14:

Comparisons of the Mean Composite Scores at Selected Percentiles of the Composite Score Distribution, U.S. and All 17 High-Income Countries in the IALS Assessment

Score Percentile	(A) U.S.	(B) All High-Income Countries	(C) Differences (A-B)	(D) Sig. of Differences	(E) U.S. Rank Among 17 Countries
Mean	272	270	+2	Not Sig.	10th
5th	133	142	-9	Sig. .02	15th
10th	176	185	-9	Sig. .05	15th
15th	208	209	-1	Not Sig.	12th
20th	222	224	-2	Not Sig.	11th
30th	247	247	0	Not Sig.	11th
50th	283	279	+4	Not Sig.	10th
60th	297	292	+5	Not Sig.	8th
80th	328	321	+7	Sig. .01	5th
85th	337	330	+7	Sig. .01	3rd*
90th	349	342	+7	Sig. .02	3rd*

* The U.S. is statistically tied with Canada for 2nd place.

rank 15th out of the 17 high-income countries participating in IALS.

From the 15th through the 60th percentiles, the composite scores of U.S. adults are statistically identical to those of all adults in high-income countries, although the U.S. typically ranks in the bottom half of the distribution for these 17 countries. From the 80th percentile onward, however, the composite scores of U.S. adults significantly exceed those of adults in the high-income IALS countries by 6 to 7 points. At the 85th and 90th percentiles, the composite scores of U.S. adults rank third highest in the world. In fact, we are statistically tied with Canada for second place on both of these measures. Only Sweden obtained significantly higher composite test scores than the U.S. at these percentiles. The findings in Table 14 indicate that the U.S. is among the best at the top of the literacy skills distribution, while also performing among the worst at the bottom of the composite literacy distribution.

The existence of such variable literacy performance among U.S. adults suggests that the distribution of literacy skills in the U.S. is characterized by a higher degree of inequality than many other individual high-income countries. To measure and compare the degree of inequality in the U.S. literacy score distributions, we also calculated the standard deviations of the prose, document, quantitative, and composite score distributions for each of 20 high-income IALS countries.[45] (Again, these countries/language groups are listed in Appendix A.) The standard deviation is a conventional indicator of the degree of dispersion of scores around the mean value for the distribution. In a normal distribution, one standard deviation accounts for about 68 percent of the distribution; two standard deviations account for roughly 96 percent of the population.

The standard deviations for each of the four literacy scales for the U.S. ranged in value from 68 to 70 points (Table 15). The U.S. ranked first on this indicator of inequality on the prose and composite score distributions and second highest on the document and quantitative scales. The U.S. was, thus, an

Table 15:

Standard Deviation of the Scores of U.S. Adults on Each Literacy Scale and Their Rank Among the 20 High-Income IALS Countries

Literacy Scale	(A) Standard Deviation	(B) U.S. Rank
Prose	68	1st
Document	70	2nd (tie)
Quantitative	69	2nd
Composite	68	1st

Note: These data are for adults age 16-65.

Table 16:

Standard Deviations of the Composite Test Scores of Selected Demographic Subgroups of U.S. Adults and Their Rank Among the 20 High-Income IALS Countries

Demographic Group	(A) Standard Deviation	(B) U.S. Rank
Men	67	2nd
Women	64	1st (tie)
Under 30	63	1st
Over 30	66	1st
25 - 54	66	1st
55 - 65	62	8th
Native born	55	6th (tie)
Foreign born	83	3rd (tie)

international leader in inequality as measured by this indicator. Six of the high-income IALS countries had 25 percent to 35 percent less inequality in their composite literacy skills distribution than did the U.S.[46]

The degree of inequality in the composite skills distribution for the U.S. was also very high for most gender, age, and nativity status groups (Table 16). The standard deviation for the male composite score distribution was 67, second highest among the 20 IALS countries, while the standard deviation for women was 64, tied for first.

For three of the four age groups, including adults under the age of 30, the standard deviations of U.S. adults were the highest among all of the 20 high-income IALS countries. While older Americans (55-65) also were characterized by a high degree of inequality in their literacy score distribution, their standard deviation was only the eighth highest among the 20 IALS nations.

A high degree of inequality in the literacy skills of all U.S. adults might be viewed as less of a problem if the distribution of skills among our youngest age cohorts was more equal. Yet, a comparison of the standard deviations for the prose, document, quantitative, and composite scores of adults under 30 and older than 30 revealed no significantly lower degree of inequality among younger adults in the U.S. at the time of the IALS assessment (Table 17). The standard deviations of the test scores among young adults in the U.S. ranged from 63 to 68 points on each of these four scales. On this measure of inequality, the U.S. ranked first among the 20 high-income countries. In other words, the U.S. is the world leader in literacy inequality among young adults, having anywhere from 60 to 90 percent more inequality in composite scores than such countries as Denmark, Finland, Germany, the Netherlands, Norway, and Sweden.

Native-born adults in the U.S. were characterized by a considerably lower degree of inequality than foreign-born adults, but their standard deviation (at 55 points) was still sixth highest among the high-income countries. Not only did foreign-born adults in the U.S. perform quite poorly on the IALS assessment, but their test score distributions were characterized by an extraordinarily high degree of inequality. The standard deviation for the composite test scores of foreign-born U.S. adults was 83, the third highest of the high-income countries. Immigrants' existing literacy skills both depress the U.S. average level of proficiency and increase the degree of inequality in the overall skills distribution.

Table 17:

Comparisons of the Standard Deviations of Scores for Adults Under 30 and 30 and Older in the U.S., by Literacy Scale

Scale	(A) Age <30	(B) Age 30 and Older	(C) Difference (A-B)	(D) Sig. of Difference
Composite	63.3	65.6	-2.3	Not Sig.
Prose	65.4	68.3	-2.9	Not Sig.
Document	68.5	71.1	-2.6	Not Sig.
Quantitative	67.1	69.1	-2.0	Not Sig.

Table 18:

A Comparison of the Test Score Gaps Between Adults in the U.S. and All High-Income Countries at Various Percentiles of the Composite Score Distribution

Gap	(A) U.S.	(B) All High-Income Countries	(C) Difference (A-B)	(D) U.S. Rank Among 20 Countries
90 - 10	163	142	+21	2nd
90 - 20	121	108	+13	2nd
90 - 50	62	57	+5	3rd
80 - 20	101	91	+10	2nd
80 - 30	77	71	+6	3rd
80 - 50	43	40	+3	5th

Table 19:

Comparisons of the Size of the 90th - 10th Percentile Gaps in Composite Scores for the U.S. and Other IALS Countries With Smaller Gaps

Country	(A) 90th Percentile	(B) 10th Percentile	(C) Difference: 90th - 10th
U.S.	345	182	163
Switzerland/French	329	209	120
Finland	344	225	119
Sweden	361	243	118
Netherlands	335	226	109
Germany	338	231	107
Norway	343	237	106
Denmark	335	236	99

In addition to looking at the degree of dispersion in terms of the standard deviation, one can also estimate the degree of inequality in a distribution by measuring the size of the gaps between the scores of adults at various high, middle, and low points along the distribution. In Table 18, the gaps in composite test scores between U.S. adults at the high end (90th, 80th), low end (10th, 20th), and middle of the composite score distribution are displayed and compared to those for all adults in high-income countries. For each of these six comparisons, the U.S. distribution was characterized by larger gaps than was true for all high-income countries combined, with the absolute size of the differences being largest for the 90-10, 90-20, and 80-20 comparisons. For each of these three inequality measures, the U.S. ranked second highest among the 20 high-income IALS countries being compared and ranked third highest on two of the remaining three inequality measures.

When we compared the score gaps between the 90th and 10th percentiles of the composite literacy distribution, we found that seven IALS countries had 90-10 differences that were 25 percent or more below those for the U.S. (Table 19). The major contributing factor to the substantially higher gap in U.S. scores was the very weak performance of U.S. adults at the 10th percentile. The estimated score of U.S. adults at this point along the distribution (182) was 27

to 61 points below that of their counterparts in the Western European nations. In the U.S., the gap in literacy scores is accompanied by a much higher economic return to strong literacy proficiencies, thereby widening economic inequality in the United States beyond that of the other IALS countries.[47]

The simultaneous presence in the NALS and IALS assessments of an above-average share of highly proficient adults along with relatively large shares of adults with very limited proficiencies calls into question the likelihood of meeting fundamental educational, economic, and scientific goals for our society. More than 130 years ago, Horace Mann commented that:

> *The scientific or literacy well-being of a community is to be estimated not so much by its possessing a few men of great knowledge as its having many of competent knowledge.*[48]

Horace Mann's remarks are quite similar to those provided by Rita Colwell, director of the National Science Foundation, when asked to comment on U.S. students' performance in the Third International Math and Science Study. She commented, "You would like to see the U.S. (be) a leader not just in research and Nobel prizes, but in how our little kids perform."[49]

The Future Outlook for Inequality Among U.S. Adults

One might argue that concerns over the existing degree of inequality in literacy skills in the U.S. adult population are legitimate but exaggerated since the nation's elementary and secondary schools may already be addressing the current problem. Yet, a careful and comprehensive look at the findings of the National Assessment of Educational Progress (NAEP) surveys in reading and math during the 1990s[50]—together with those from the 1999 TIMSS[51]—supports the opposite conclusion. Inequalities in key learning outcomes are either rising or at best stable, and the degree of inequality in skills among U.S. students is higher than in nearly all other high-income countries.

The NAEP reading assessment of the nation's fourth graders reveals that the standard deviation of reading test scores changed significantly between 1992 and 2000, from 36 to 40. Further, the assessment data for these fourth graders show a widening gap between the top and bottom performers. Although the standard deviation of reading test scores did not change for 8th graders between 1992 and 1998, the degree of dispersion in scores widened among 12th graders over this period of time; the standard deviation rose significantly, from 33 to 38 points, and the gap between the reading scores of those at the 10th and 90th percentiles also grew.

While mean NAEP math scores for 4th, 8th, and 12th graders rose significantly between 1990 and 2000, there were no declines in the standard deviations of the math scores for any of these three educational groups. Further, among 12th graders, there was no significant decline over the decade in the very large gap in performance between those at the 90th and 10th percentiles of the math score distribution.

Findings of the 1999 international TIMSS math assessment revealed that the standard deviation in math scores for U.S. eighth graders was 11th highest among the 38 countries participating in the assessment and third highest among the 16 high-income countries assessed. On the international science assessment, the 97-point standard deviation for U.S. eighth graders was tied for sixth highest among the 38 countries and was fifth highest for boys. No major industrial country had a standard deviation as high as that for boys in the eighth grade in the U.S.

Together, these data from major national and international surveys of reading, math, and science skills among U.S. elementary, junior-high, and high-school students show no evidence of a decline in inequality over the decade and no reduction in the degree of inequality here as compared with most other high-income countries. These are very troubling findings, given the high degree of inequality prevailing in the U.S. assessment scores at the beginning and middle of the 1990s.

The continued high levels of inequality in literacy, math, and science knowledge among elementary and secondary students, young adults, and the entire adult population of the U.S. do not bode well for the future outlook on inequality in the schools, the economy, the labor markets, and our social and civic life. If we fail to reduce the degree of inequality in literacy skills over the coming decade, then the cognitive demands for access to most high-skilled, high-wage jobs in U.S. labor markets and for active participation in civic and political life will create a bifurcated distribution of economic and political rewards in the future. These data should serve as a call to action by all who care about achieving a more egalitarian set of economic, political, and social outcomes for the nation in the first decade of the 21st century.

To be sure, the dual tasks of achieving a sustained rise in the average literacy proficiencies of U.S. adults along the entire age distribution and significantly reducing the dispersion of such skills in the adult population will present formidable challenges to the nation's formal and informal educational systems at all levels over the coming decade. Yet, to paraphrase the remarks of the late U.S. Senator Barry Goldwater, extremism in the defense of improved literacy skills for all Americans is no vice. The continued defense of an educational system that generates and perpetuates such mediocrity and inequality in our nation's literacy skills is no virtue.

Summary of Findings and Policy Recommendations

The United States needs "world class" literacy and numeracy skills if it is to remain a leader in real output per capita, economic growth, productivity, and competitiveness in the 21st century. In our view, world class means the ability to compete with the best, i.e., with other highly developed, high-income, highly educated countries. The U.S. deserves and should expect these world class skills, given its commitment to and expenditures for education. Thus, our national literacy benchmarks must be set with this goal in mind.[52]

Some analysts would debate the importance of being at the top of such a world class literacy scale. Being more productive matters more than being more literate, they argue. Others, including a Forbes' magazine editorialist, have questioned the implications of the observed skills distribution in the U.S.[53] However, our preceding analyses suggest several reasons why the degree of mediocrity and inequality we see in the large-scale assessment data does matter.

First, the U.S. spends more per capita on education than nearly all other high-income countries.[54] Despite our higher levels of spending and educational attainment, our average proficiency scores at best only match the world average. The average score of U.S. adults on the IALS composite scale is at the 53rd percentile, i.e., in the middle of the skills distribution for high-income countries participating in IALS. Further, when we rank the composite literacy scores of native-born high-school graduates in all high-income IALS countries, the U.S. is 13th on the list. Our educational system is clearly less productive in raising the literacy skills of students per dollar spent. With broadly defined educational expenditures—including the opportunity costs of attending school in terms of foregone earnings and lost leisure—being close to one-eighth of the nation's GNP, this inefficiency is a major drain on our economy. Further, our renewed national commitment to educational improvements over the past decade has thus far yielded only minor gains.

Second, the U.S. appears to be living off its past higher educational investments and will inevitably lose ground in the coming decade. Our oldest adults (56 and older) ranked second highest among the 19 high-income IALS countries on the prose scale, reflecting our early lead in general education. As we look to younger cohorts, our advantage begins to diminish and then disappear. Our adults aged 46-55 and 36-45 also ranked in the top five among these high-income countries. Our youngest cohorts, however, those 26-35 and 16-25 years old, ranked only 11th and 14th, respectively. This finding most likely reflects the comparative educational improvements around the world and the greater effectiveness in raising skills of schools in other high-income IALS countries. If we were to project out some 20 years—assuming no further relative decline for the upcoming generation—the average in the U.S. would decline from just above average to just below average on this international composite scale.

Third, the nation's changing demographics will likely exacerbate the literacy skill deficit in the coming years since most of the fastest-growing population groups are those with below-average skills. The average literacy scores of native-born Blacks and Hispanics in the U.S. were at the 28th percentile on the composite scale. Similarly, the average performance of all U.S. immigrants is at the 17th percentile on the composite scale of high-income countries, and immigration has accounted for a high and rising share of U.S. population growth over the past decade. Unless the skills of these population groups are substantially strengthened in the years ahead, their growing share of the adult population will subtract several points from the national average over the next 20 years.

Fourth, although skills influence labor market success everywhere in the world, this is especially true in the U.S. and other English-speaking countries. Our skills underclass is larger, and it is also relatively worse off, generating much higher wage and income inequality.

Hence, those concerned about the high degree of economic inequality in the U.S. must understand it in the context of the high degree of inequality in our underlying skill distributions. An enhancement in the literacy proficiencies of adults with below-average proficiencies would produce economic benefits for them and for the rest of society through increased tax revenues and lower public transfers, both cash and in-kind benefits.

Fifth, mediocre skills and inequality in the distribution of skills may have worked reasonably well in recent years but are not likely to do so in the future. The low-wage/low-skill economic model relied upon by many firms provides limited incentives and opportunities for increased skill acquisition by low literacy workers after leaving school. In good times, our workers with world class skills may provide the economic motor that obviates the effects of the export of jobs to the rest of the world for workers with more limited skills and the import of workers to fill jobs that place the least demand on these skills. In more normal economic times, the low-skilled workers are more likely to become a drag on the economy. In bad times such as the present, they are redundant and depress the real wages of existing workers with limited skills, thereby worsening an already distorted wage distribution.

If these arguments are accepted, then the current mediocrity and inequality in the distribution of literacy skills in the U.S. must be accepted as preeminent national problems and priorities. But can these problems be addressed? And, if so, how?

Some argue that the diversity of the U.S. population and our nation's openness to foreign immigration foreordain greater inequality. Many racial and ethnic minorities, as well as immigrants, tend to have below-average skills, and the U.S. has more of both groups in its population. In addition, our immigrants have lower and more unequal skills than those in most other high-income countries. If our immigrant share were reduced to the rest-of-the-high-income-world average, our international rank in literacy scores would increase by 2 to 3 points. But the rank of the U.S. would also be raised by 6 points if its current minority and immigrant populations had the same skills as their native-born Asian and White counterparts.

Others argue that income inequality is inevitable in a land of opportunity in which economic rewards vary according to work effort, human capital skills, and financial investments. Everyone gets an equal chance, the argument goes, and those with more ability and gumption will advance farther and faster. The U.S. ranks near the top on education spending and sends far more of its population on to higher education. Furthermore, the income and occupational rewards of higher skills are larger in the U.S. compared to most of the other high-income countries included in these analyses.

Unfortunately, inequality is deeply rooted in the education system and in the workplace in the United States. Those entering any level of the educational system with below-average skills are far less likely to advance to the next level, receive far fewer hours of applied learning time, and hence gain far fewer skills. The same holds true in the labor market. Workers in the U.S. with literacy skills in the highest levels (Levels 4/5) are 10 times as likely to receive training from their employer as workers with the most limited (Level 1) skills. U.S. spending on higher education is far above average, but spending on adult basic education and job training for the low skilled is below average. In the labor market, there are frequently huge rewards for workers with certified technical skills and college diplomas, but no formal system for differentiating and rewarding basic skills for workers without such degrees. With an unlimited supply of low-wage, low-skilled immigrants, employers do not need to reward or train at the low end of the skills distribution.

In other words, our nation concentrates on producing and rewarding first-class skills and, as a result, is world class at the top; however, it spends a great deal to

achieve this result. It accepts in fact, if not in rhetoric, a basic skills underclass. It spends meagerly to help adults with limited or restricted skills or on the next generation that will join their ranks.

To raise our nation's literacy performance beyond its present mediocre level and to reduce inequality in the distributions of these skills, more must be done for those at the bottom of the skill distributions. This does not automatically mean spending more, although more resources would help, and it does not mean taking resources away from those at the top. It means cutting waste, retargeting available resources, and revamping the rules and rewards of the education and labor market systems.

Among other things, we need to think of more creative ways to provide incentives for parents, students, workers, schools, and employers who want to change the status quo and continued opportunities and rewards for those who succeed. We could, for example, offer funding for students with more limited skills to seek learning opportunities outside of school. And, we could combine this funding with a program that provides increased monies for those who demonstrate significant improvement to purchase additional learning opportunities. The point is that if we want more than just our best to have world class skills then we don't want to offer diplomas or grant degrees to those without these skills any more than we want to close doors or limit opportunities. We should set higher standards for literacy and numeracy at every grade including our postsecondary institutions.

The focus, however, cannot be confined to our student population, whether it is prekindergarten, K-12, or postsecondary. Any unemployed or low-income working adult with limited skills should also be eligible for funding that covers a minimum number of hours of outside instruction plus some sort of financial incentive for demonstrating real skill gains. Those who are motivated and do succeed should be given additional monies or funding that would enable them to pursue subsequent opportunities. As things currently stand, individuals with higher level literacy skills are more likely to be employed and receive additional learning opportunities, which further improve their knowledge and skills as well as future earning opportunities. How unreasonable would it be if we began to think of education and training the same way we think about health care and retirement benefits? Tax laws currently require equal treatment of employees in these areas. If the same were required for skill remediation and learning, it is reasonable to assume that efforts aimed at low-skilled adults would increase.

These and other types of initiatives that would provide students, adult learners, schools, and universities as well as employers with incentives to improve overall literacy rates and reduce our current levels of inequality would require a redirection of existing policies, programs, and institutional arrangements. And they do not require that some individuals lose in order that others may gain. We can be a world leader in maximizing the number of adults with world class skills at the same time we minimize the number with limited skills. To paraphrase the remarks of Horace Mann, we can have both some people of great knowledge as well as many people of competent knowledge. We can improve our standing in the world for our least as well as our most proficient, if only we have the will and the commitment to accomplish this goal.

Appendix A:

List of the 20 High-Income IALS Countries/Language Groups Included in the Prose, Document, Quantitative, and Composite Score Analyses

Australia Belgium (Flanders) Canada, (English) Canada, (French) Denmark Finland France	Germany Great Britain Ireland Italy Netherlands New Zealand Northern Ireland	Norway Sweden Switzerland (French) Switzerland (German) Switzerland (Italian) United States

List of 6 Middle-Income IALS Countries Excluded from the Analyses in this Report

Chile Czech Republic Hungary	Slovenia Poland Portugal

Appendix B:

List of the 17 IALS Countries Included in the Comparative Analysis of Composite Scores

Australia Belgium (Flanders) Canada Denmark Finland France	Germany Great Britain Ireland Italy Netherlands New Zealand	Northern Ireland Norway Sweden Switzerland United States

Appendix C:

List of the 14 IALS Countries Included in the Analysis of Young Adults' (Age 20-25) Scores

Australia Belgium (Flanders) Canada Denmark Finland Germany Ireland	Netherlands New Zealand Norway Sweden Switzerland United Kingdom United States

Appendix D:

U.S. Adults' Mean Prose, Document, and Quantitative Scores, Their Percentile Rank on the IALS Scales, and the U.S. Rank Among 19 IALS Countries by Level of Schooling

Prose

Schooling Level	(A) Prose Scores	(B) Percentile Rank	(C) Rank Among 19 Countries
None to primary school*	186.0	10th	14th
Some high school, no diploma or GED	228.5	24th	19th
High school graduate	272.0	48th	18th (tie)
1-3 years of college	293.2	63rd	15th
Bachelor's degree or higher	319.9	80th	5th

Document

Schooling Level	(A) Document Scores	(B) Percentile Rank	(C) Rank Among 19 Countries
None to primary school*	170.6	9th	16th*
Some high school, no diploma or GED	228.0	24th	19th
High school graduate	267.8	45th	19th
1-3 years of college	288.2	59th	17th
Bachelor's degree or higher	312.3	75th	15th (tie)

Quantitative

Schooling Level	(A) Quantitative Scores	(B) Percentile Rank	(C) Rank Among 19 Countries
None to Primary School*	184.2	10th	15th
Some High School, No Diploma or GED	233.5	23rd	19th
High School Graduate	272.3	44th	19th
1-3 Years of College	295.7	60th	17th
Bachelor's Degree or Higher	323.0	79th	13th

* Data are only available for 18 countries for this educational group.

Appendix E:

Mean Prose, Document, and Quantitative Scores of U.S. Adults In Particular Nativity and Race/Ethnic Subgroups of Interest

Group	(A) Prose	(B) Document	(C) Quantitative
All adults	273.3	267.1	274.2
Native-born only	284.6	278.7	284.4
Native born:			
High-school graduates	295.4	289.9	295.3
White and Asian only	288.2	281.7	288.3
Black and Hispanic	241.9	235.7	231.0

Note: Race/ethnic data are from the 1992 NALS assessment. All findings are restricted to those under age 65.

Appendix F:

Comparisons of the Scores of Adults in the U.S. and All High-Income Countries at Selected Points Along the Score Distribution, by Literacy Scale

Prose Scale

Percentile	(A) U.S.	(B) All High-Income Countries	(C) Differences (A-B)	(D) Sig. of Differences	(E) Rank Among 21 Countries
5th	137.8	145.4	-7.6	Not Sig.	19th
10th	181.9	184.2	-2.3	Not Sig.	19th
15th	208.6	206.9	+1.7	Not Sig.	13th
20th	224.5	221.7	+2.8	Not Sig.	14th
30th	247.4	242.3	+5.1	Not Sig.	12th
50th	282.4	274.6	+7.8	Sig. .01	8th
70th	312.3	303.2	+9.1	Sig. .01	4th
80th	327.9	319.6	+8.3	Sig. .01	4th
85th	338.0	328.7	+9.3	Sig. .01	3rd
90th	350.7	340.8	+9.9	Sig. .01	3rd

Document Scale

Percentile	(A) U.S.	(B) All High-Income Countries	(C) Differences (A-B)	(D) Sig. of Differences	(E) Rank Among 21 Countries
5th	125.6	134.2	-8.6	Sig. .05	18th
10th	169.6	177.8	-8.2	Not Sig.	19th
15th	194.8	201.7	-6.9	Sig. .05	17th
20th	212.1	218.4	-6.3	Not Sig.	16th
30th	241.9	242.6	-.7	Not Sig.	14th
50th	276.3	275.2	+1.1	Not Sig.	14th
70th	307.2	303.6	+3.6	Not. Sig.	11th
80th	324.2	320.7	+3.5	Sig.05	9th
85th	334.4	330.4	+4.0	Not Sig.	7th
90th	347.1	343.2	+3.9	Not Sig.	7th

Quantitative Scale

Percentile	(A) U.S.	(B) All High-Income Countries	(C) Differences (A-B)	(D) Sig. of Differences	(E) Rank Among 21 Countries
5th	138.6	143.4	-4.8	Not Sig.	19th
10th	178.9	183.9	-5.0	Not Sig.	16th
15th	205.5	209.7	-4.2	Not Sig.	15th
20th	224.1	225.5	-1.4	Not Sig.	15th
30th	246.9	248.4	-1.5	Not Sig.	14th
50th	282.2	280.7	+1.5	Not Sig.	14th
70th	312.7	309.0	+3.7	Sig. .05	11th
80th	331.1	325.5	+5.6	Sig. .01	6th tie
85th	339.7	335.3	+4.4	Sig. .05	7th
90th	354.1	347.2	+6.9	Not Sig.	3rd

Endnotes

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6 For recent examples of such studies, see: (i) Anthony Carnevale and Stephen J. Rose, *Education for What? The New Office Economy,* Educational Testing Service, Washington, D.C., 1998; (ii) John Comings, Andrew Sum, and Johan Uvin, *New Skills for A New Economy: Adult Education's Key Role in Sustaining Economic Growth and Expanding Opportunity,* The Massachusetts Institute for A New Commonwealth, Boston, 2000; (iii) Harry J. Holzer, *What Employers Want: Job Prospects for Less Educated Workers,* Russell Sage Foundation, New York, 1996; (iv) Richard J. Murnane and Frank Levy, *Teaching the New Basic Skills,* The Free Press, New York, 1996; (vi) Garth Mangum, Stephen Mangum, Andrew Sum, et al., *A Second Chance for the Fourth Chance: A Critique of the Workforce Investment Act of 1998,* Sar Levitan Center for Social Policy Studies, Johns Hopkins University, Baltimore, 1999; (v) Peter Cappelli, Laurie Bassi, et al., *Change at Work,* Oxford University Press, New York, 1997.

7 For a review of empirical findings on the links between academic proficiencies and labor market success for a wide array of worker groups, see: (i) Gordon Berlin and Andrew Sum, *Toward A More Perfect Union;* (ii) Sue Berryman, "The Role of Literacy in the Wealth of Individuals and Nations"; (iii) William R. Johnson and Derek Neal, "Basic Skills and the Black-White Earnings Gap," in *The Black-White Test Score Gap,* Brookings Institution Press, Washington, D.C., 1998; (iv) John Tyler, Richard Murnane, and John Willett, "Do the Cognitive Skills of School Dropouts Matter in the Labor Market?" NCSALL Report, Washington, D.C., April 2000; (v) Andrew Sum, *Literacy in the Labor Force*, National Center for Education Statistics, Washington, D.C., 1999; (vi) Andrew Sum, Neeta Fogg, and Garth Mangum, *Confronting the Youth Demographic Challenge;* (viii) Christopher Winship and Anders D. Korneman, "Economic Success and the Evolution of Schooling and Mental Ability," in *Earning and Learning: How Schools Matter,* Brookings Institution Press, Washington, D.C., 1999, pp. 49-78. Empirical findings on the links between the literacy proficiencies and formal schooling of adults and their earnings in the IALS countries can be found in: Organisation for Economic Cooperation and Development and Statistics Canada, *Literacy in the Information Age.*

8 For an analysis of the literacy and educational deficits of poor adults and public assistance recipients in the U.S. in the 1980s and 1990s, see: (i) Paul E. Barton and Lynn Jenkins, *Literacy and Dependency: The Literacy Skills of Welfare Recipients in the United States,* Educational Testing Service, Princeton, New Jersey, 1995; (ii) Irwin S. Kirsch et al., *Adult Literacy in America;* (iii) Andrew M. Sum, *Literacy in the Labor Force*; (iv) Andrew M. Sum, Neeta Fogg, and Garth Mangum, *Confronting the Youth Demographic Challenge*; (v) Richard L. Venezky, Carl F. Kaestle, and Andrew M. Sum, *The Subtle Danger: Reflections on the Literacy Abilities of America's Young Adults*, Educational Testing Service, Princeton, 1987. Findings of the IALS assessment for Canada revealed that public assistance recipients in Canada are also substantially concentrated in the bottom two levels of prose, document, and quantitative proficiencies. Between two-thirds and 70 percent of Social Assistance recipients in Canada had prose, document, or quantitative proficiencies in the bottom two levels. See: Statistics Canada, *Reading the Future: A Portrait of Literacy in Canada*, pp. 48-49.

9 For research findings on the relationships between the literacy proficiencies of adults in the U.S., Canada, and other IALS countries and their civic and community activities and voting behavior, See: (i) Helen Brown, Robert Prisuta, Bella Jacobs, and Anne Campbell, *Literacy of Older Adults in America*, National Center for Education Statistics, Washington, D.C., 1995; (ii) John Comings, Andrew Sum, and Johan Uvin, *New Skills for A New Economy*; (iii) Irwin S. Kirsch et al., *Adult Literacy in America*; (iv) Organisation for Economic Co-operation and Development and Statistics Canada, *Literacy, Economy, and Society: Results of the First International Adult Literacy Survey*, Ottawa, 1995; (v) Statistics Canada, *Reading the Future: A Portrait of Literacy in Canada*; (vi) Richard L. Venezky, David Kaplan, et al., *Literacy Practices, Library Use and Voting: An Analysis of the 1992 National Adult Literacy Survey (NALS)*, University of Delaware, December 1994. Literacy skills are also related to the ability of adults in the United States to obtain good health. See: Rima Rudd, "Health and Literacy: A Review of Medical and Public Health Literacy," in *The Annual Review of Adult Learning and Literacy*, Jossey-Bass, San Francisco, 1996.

10 The rise in income inequality in the U.S. over the past few decades has been linked to declines in social capital formation. See: Dora L. Costa and Matthew E. Kahn, *Understanding the Decline in Social Capital*, 1952-1958, MIT and Tufts University, May 2001.

11 For a review of the purposes, design features, and findings of the National Adult Literacy Survey (NALS) that was conducted in 1992 by the Educational Testing Service for the U.S. Department of Education, see: (i) Irwin S. Kirsch et al., *Adult Literacy in America*; (ii) Karl O. Haigler, Caroline Harlow, Patricia O'Connor, and Anne Campbell, *Literacy Behind Prison Walls: Profiles of the Prison Population from the National Adult Literacy Survey*, National Center for Education Statistics, U.S. Department of Education, Washington, D.C., 1994; (iii) Andrew M. Sum, *Literacy in the Labor Force.*

12 See:(i) Irwin S. Kirsch and Ann Jungeblut, *Literacy Profiles of America's Young Adults*, Educational Testing Service, Princeton, New Jersey, 1986; (ii) Richard L. Venezky, Carl F. Kaestle, and Andrew M. Sum, *The Subtle Danger*; (iii) Irwin S. Kirsch, Ann Jungeblut and Anne Campbell, *Beyond the School Doors: The Literacy Needs of Job Seekers Served by the U.S. Department of Labor*, Educational Testing Service, Princeton, New Jersey, 1997.

13 For further information on the sample size and design of the NALS survey, see: Irwin S. Kirsch et al., *Adult Literacy in America*, pp. 5-7.

14 For a review of the purposes, design features, sample design, timing, and findings of the International Adult Literacy Surveys, see: (i) Organisation for Economic Cooperation and Development and Statistics Canada, *Literacy, Economy, and Society*; (ii) Organisation for Economic Cooperation and Development and Statistics Canada, *Literacy in the Information Age*. Key findings of the Canadian survey are presented in: Statistics Canada, *Reading the Future: A Portrait of Literacy in Canada*. For another comparison of the literacy proficiency of Americans with that of other populations, see: Albert Tuijnman, *Benchmarking Adult Literacy in America: An International Comparative Study*, Division of Adult Education and Literacy, Office of Vocational and Adult Education, U.S. Department of Education, September 2000.

15 In a few countries, persons under 16 and older than 65 were included in the survey. For example, Australia surveyed individuals from age 15 to age 74. However, the findings presented in this report are restricted to the 16-65 population.

16 For a review of sampling design issues, See: Organisation for Economic Cooperation and Development and Statistics Canada, *Literacy in the Information Age*, pp. 107-121.

17 The authors felt that a composite scale would be useful in summarizing and presenting some of the results. We also felt it was justified given the similarities in means and standard deviations across the three literacy scales.

18 According to per capita Gross Domestic Product (GDP) estimates for 1998 developed by the World Bank, each of these six countries had a GDP per capita in U.S. dollars of $10,690 or less in 1998, while the high-income countries had per capita GDPs ranging from $18,340 (Ireland) to $40,080 in Switzerland. See: The World Bank, *Entering the 21st Century: World Development Report, 1999/2000*, Oxford University Press, New York, 2000.

19 In a separate analysis, we compared the mean composite scores of the U.S. against those of the six middle-income countries excluded from the analysis. Adults in the U.S. significantly outperformed their counterparts in five of these countries, but the mean composite score of U.S. adults was significantly below that of the Czech Republic (272.2 vs. 283.3).

20 The significance tests are t-tests of the differences between two sample means, using a two-tailed test of the difference.

23 See: John Comings, Andrew Sum, Johan Uvin, et.al, *New Skills for A New Economy: Adult Education's Role in Sustaining Economic Growth and Expanding Opportunity*, Massachusetts Institute for a New Commonwealth, Boston, 2001.

24 See: (i) Irwin S. Kirsch et al., *Adult Literacy in America*, pp. 116-118; (ii) Helen Brown et al., *Literacy of Older Adults in America*.

25 See: William B. Johnston and Arnold E. Packard, *Workforce 2000: Work and Workers for the 21st Century*, Hudson Institute, Indianapolis, 1987.

26 See: Irwin S. Kirsch et.al, *Adult Literacy in America*, p. 47.

27 See: Andrew M. Sum, *Literacy in the Labor Force*, pp. 47-49.

28 The 19-country analysis includes separate data for English and French Canada and for French, German, and Italian areas of Switzerland, but excludes the findings for France.

29 See: Irwin S. Kirsch et al., *Adult Literacy in America*, pp. 30-32.

30 For a more detailed analysis of these findings on the effects of aging on the proficiencies of the future labor force, See: Andrew Sum, *Literacy in the Labor Force*, especially pp. 95-97.

31 In this analysis, findings for Canada and Switzerland are for the entire country rather than language divisions, the results for Great Britain and Northern Ireland are combined, and France is excluded from the analysis. A listing of all 14 countries is presented in Appendix C.

32 The mean prose, document, and quantitative proficiencies of young high school dropouts were equivalent to only the 18th to 23rd percentiles on the international test score distribution for high-income countries.

33 In this analysis, the data for France were excluded. The U.S. data are included in the 19 IALS country totals.

34 See: Herbert J. Walberg, *Spending More While Learning Less*, Thomas B. Fordham Foundation, Washington, D.C., 1998; Herbert J. Walberg, "Do American Students Study Enough?," in T*he Weekly Standard*, July 23, 2001, p. 41.

35 For other findings of international comparisons of student test performance and time use, see: (i) Merry White, *The Japanese Educational Challenge: A Commitment to Children*, Free Press, New York, 1987; (ii) Howard W. Stevenson and James W. Stigler, *The Learning Gap*, Summit Books, New York, 1992; (iii) Ina V.S. Mullis, Michael O. Martin, et al., *TIMSS 1999: International Mathematics Report*, The International Study Center, Boston College, Boston, 2000.

36 See: (i) Andrew Sum, Paul Harrington, Neeta Fogg, Sheila Palma, et al., *An Analysis of the Preliminary 2000 Census Estimates of the Resident Population of the U.S. and Their Implications for Demographic, Immigration, and Labor Market Analysis and Policymaking*, Center for Labor Market Studies, Northeastern University, Boston, 2001; (ii) Steven A. Camorata, *Immigration in the United States, 2000*, Center for Immigration Studies, Washington, D.C., January 2001.

37 See: Robert A. Nakosteen and Andrew Sum, "Immigration's Impact on the Commonwealth," *Massachusetts Benchmarks*, Spring 2001, Volume 4, Issue Two, pp. 13-18.

38 These estimates are based on the March 2000 CPS household survey's public use files, tabulations by

the Center for Labor Market Studies of Northeastern University.

39 Of the nine countries with higher mean composite scores than the U.S., six had significantly higher mean scores than the U.S. The three other countries (Canada, Switzerland, and Australia) had mean scores that were modestly above those of the U.S. but were not significantly different.

40 Immigrants in the U.S. were more poorly educated than their peers in the other IALS countries; thus, they likely represented a relatively high share of all poorly educated immigrants in all high-income countries.

41 For a review of previous research findings on the links between the self-reported English-speaking abilities and literacy proficiencies of immigrants and their wages and earnings from employment, See: (i) George J. Borjas, *Heaven's Door: Immigration Policy and the American Economy*, Princeton University Press, Princeton, New Jersey, 1999; (ii) Anthony Carnevale, Richard Fry and B. Lindsay Lowell, *The Value of Bi-Lingualism in the U.S. Labor Market*, Educational Testing Service, Washington, D.C., 2001; (iii) Barry R. Chiswick and Paul W. Miller, "English Language Fluency Among Immigrants in the United States," *Research in Labor Economics,* Volume *17*, 1998; (iv) Gregory DeFreitas, *Inequality at Work: Hispanics in the U.S. Labor Force*, Oxford University Press, New York, 1991; (v) Andrew M. Sum, *Literacy in the Labor Force.*

42 The number of sample cases for Black, Hispanic, and foreign-born adults on the NALS database is considerably greater than on the IALS database and thus should provide more statistically reliable results.

43 These measures of dispersion are frequently used by economists as indicators of inequality or variability in a distribution. See, for example, Lars Osberg, *Economic Inequality and Poverty*, Armonk NY: M.E. Sharpe, Inc., 1991. We also use the term inequality in this paper to reflect our understanding and belief that the unequal score distributions we see in the U.S. contribute to the disparities in educational and economic opportunities in our country.

44 In this analysis, Canada's and Switzerland's scores represented the whole country rather than separate scores for each language group.

45 The standard deviations of the composite test score distribution for the six middle-income IALS countries also were lower than that for the United States.

46 The standard deviation of the composite test score distribution is higher in the U.S. than in Canada, England, and France, but the difference between the standard deviations of those countries and the U.S. are not statistically significant at the .05 level. From a statistical vantage point, the U.S. is tied for first with these three other countries.

47 For evidence on differences in the economic returns to schooling and literacy in the IALS nations, see: Organisation for Economic Co-operation and Development, and Statistics Canada, *Literacy in the Information Age*, Paris and Ottawa, 2000.

48 See: Horace Mann, *Lectures and Annual Reports on Education*, Cambridge, MA, 1867.

49 This quotation appeared in the following *New York Times* article on the results of the TIMSS survey. See: Diana Jean Schemo, "Students in U.S. Do Not Keep Up in Global Tests..." *New York Times*, December 5, 2000, pp. A-1, A-18.

50 U.S. Department of Education. Office of Educational Research and Improvement. National Center for Education Statistics. *The Nation's Report Card: Fourth-Grade Reading 2000*, NCES 2001-499, by

P. L. Donahue, R.J. Finnegan, A.D. Lutkus, N.L. Allen, and J.R. Campbell. Washington, DC: 2001 and U.S. Department of Education. Office of Educational Research and Improvement. National Center for Education Statistics. *The Nation's Report Card: Mathematics 2000*, NCES 2001-517, by J.S. Braswell, A.D. Lutkus, W.S. Grigg, S. L. Santapau, B.S.-H. Tay-Lim, and M.S. Johnson. Washington, DC: 2001.

51 See: Ina V.S. Mullis et al., *TIMSS 1999: International Mathematics Report.* Boston College, Lynch School of Education, Boston, MA, 2000.

52 We base the idea of a "world class" rank on the composite literacy skills of a population, subgroup, or country relative to the percentile distribution for adults in economically advanced countries participating in the IALS. On this percentile scale, 50 is average, <50 is below average, and >50 is above average.

53 See: Dan Seligman, *The Crisis that Isn't*, Forbes Magazine, October 2, 2000.

54 For findings on U.S. educational spending per student at the elementary and secondary level relative to other OECD countries, see: (i) Organization for Economic Cooperation and Development, *Education at a Glance*, Paris, 2000; (ii) Herbert J. Walberg, "Achievement in American Schools"; (iii) Herbert J. Walberg, *Spending More While Learning Less*, Thomas B. Fordham Foundation, Washington, D.C., 1998.

34326-009325 • PP22M6 • Printed in U.S.A.
I.N. 993617

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