

Cognitive Skills in the US Labor Market: For Whom Do They Matter?

Harry J. Holzer and Robert I. Lerman

The measured levels of skill proficiency in the U.S. are low relative to those in many other OECD countries. In the U.S. low proficiency in literacy, numeracy and problem-solving can be found in all demographic groups – young and old, male and female, native-born as well as immigrant, and even at higher rungs on the educational and occupational ladders. This analysis of PIAAC data focuses on how these skills are rewarded in the U.S. labor market. How closely are cognitive skills associated with earnings? Do educational attainment and occupation account for all or nearly all the earnings gains associated with these skills, or are the gains sustained even after accounting for them? For which demographic, education and occupation groups do these skills matter most? And what are the implications for using educational attainment as the proxy for skill, when other skill-related factors affect earnings?

Our findings are as follows:

- The market generates quite strong rewards to literacy, problem-solving and especially numeracy proficiency. These returns can be found for all demographic groups, for those with low as well as high educational attainment, and in virtually every occupational group. Indeed, literacy and/or numeracy proficiency seem to be preconditions to other forms of more specific occupational training that are needed to advance within all parts of the job market.
- The gains associated with reading and math proficiency vary somewhat across groups of workers. Older workers see the highest returns to numeracy while younger workers gain more from literacy. U.S.-born workers benefit a great deal from enhanced numeracy, even after controlling for education. Foreign-born workers see no benefit, once we take account of educational level.
- The effect of educational attainment on earnings leaves a great deal of earnings variation linked to proficient and high levels of numeracy and literacy. The patterns differ by educational level. Workers with no more than a high school diploma experience markedly higher earnings when they are proficient in literacy and numeracy. A high school graduate who moves from low to proficient in both literacy and numeracy would be expected to obtain a job that pays almost \$16,000 more per year. Numeracy skills are especially important for those with BA degrees, and now over one in three (37 percent) of BAs are at the lowest proficiency in numeracy.
- Cognitive skills raise earnings among those within the same occupation, but not in all cases. For managers and professionals and for craft workers and machine operators, the gain comes from reaching proficient levels of numeracy. For technical and associate professions, added proficiency in literacy is valuable. But, for clerical, sales, laborers, and service workers, higher cognitive skills exert little impact on earnings within the occupation.

Overall, the skill measures compiled for PIAAC are indeed consequential and demonstrate that educational attainment offers only a partial indicator of skills relevant to the labor market.

Revisiting the effects of skills on economic inequality:

Within- and cross-country comparisons using PIAAC

Anita Alves Pena

- Previous studies examining relationships between skills and economic distributions within and across countries found mixed results due to
 - variation in empirical methods
 - limited availabilities of consistent skill data separate from education histories
- Program for the International Assessment of Adult Competencies (PIAAC) data allows us to study how literacy, numeracy, and problem-solving skills relate to wage inequality in an international context characterized by
 - economic forces of demand and supply
 - institutions, customs, and culture
- Descriptive statistics suggest
 - substantial economic inequality across countries, levels and distributions of skill measures, and gender
 - more variability in the lower half of each country's skill distribution by all three skill measures
 - but, more variability in the upper halves of country-specific wage distributions
- Econometric decomposition modeling of several inequality measures allows for analysis of the relative importance of differences
 - in levels of skills and other observable determinants of wages across countries
 - in measured rates of return to these levels of skills and other wage determinants across countries
 - in unobservable (unmodeled) features (e.g., institutions, unobserved non-cognitive skill, etc.)
- The study reinforces previous findings that skills by themselves (even when measured in a comprehensive way as by PIAAC) are only a partial explanation for observed patterns of wage and earnings inequality across countries
 - Both demand and supply factors, and often to a much greater extent, unobservable characteristics of institutions and people matter for economic inequality
 - Addition of new digital problem solving skill measure does not substantially reduce the high importance of unobservable factors when compared to previous literature
 - Thus, this missing human capital variable in previous datasets is not a primary driver of the large unobservable factor contribution to wage inequality that is noted in the literature and reconfirmed here
- The specific demographic characteristic of gender is of particular interest given its importance as a determining factor of wages in the literature
 - Some results are found sensitive to gender since wage inequality is higher for women in some contexts
 - But, the importance of unobservables in the determination of inequality is unchanged

- Robustness tests show few notable differences across immigration status categories (another characteristic suggested in literature as important for wage determination)
 - Major results are also robust to
 - alternative measures of education (to include non-formal education)
 - the exclusion of age variables as independent variables in the baseline models
 - use of alternative earnings measures (hourly wages with bonuses, monthly wages, monthly wages with bonuses, and monthly wages of the self-employed)
- Results suggest limits in terms of the use of education and training opportunities that promote skills for the (additional) purpose of reducing wage inequality across subgroups
- Future work should further examine the contributions to economic inequality of specific differences in labor and product market regulations across countries
- Since certain countries are excluded in some specifications due to data limitations, the paper highlights the importance of greater international consistency in future releases of PIAAC variables for understanding the true causes of economic inequality within and across nations and for developing actionable plans

Gender and Numeracy Skill Use: Cross-National Revelations from PIAAC

Danielle J. Lindemann

- While previous research has focused on the underrepresentation of women in Science, Technology, Engineering, and Math (STEM), data from PIAAC allow us, for the first time, to look at gender gaps in the level of numeracy *skill use* at work.
- Male workers, overall, are more likely than female workers to be performing numerical tasks associated with STEM occupations. However, these mean differences in numeracy skill use are not statistically significant within every OECD country or every sub-population of workers.
- When women *do* use numeracy skills at work, in what jobs do they do it? Narrowing the data to look at workers in the United States reveals that men and women who engage in large amounts of numeracy skill use in their jobs are employed in many of the same job categories.
- However, numeracy skill use at work is also stratified in ways that align with historical patterns of occupational gender segregation in the United States.
 - For example, female workers who engage in large amounts of numeracy skill use cluster within careers such as nursing and early childhood education, while men who use large amounts of numeracy in their job are more likely to be working in historically-“male” careers (*e.g.* mining, manufacturing, engineering).
 - While these findings are in accordance with previous scholarship about gender and work, in another sense they problematize previous research by revealing the large amounts of numeracy involved in some historically-“female” occupations.
 - Further, they point to the idea that thinking about “STEM” in terms of high-level occupations such as physicist or engineer, rather than in terms of discrete tasks that can be basic or advanced, eclipses the numeracy skill usage that takes place across a spectrum of occupational categories, both blue-collar and white-collar.
- Finally, women who perform large amounts of quantitative tasks at work tend to have studied in different fields from their male counterparts. In addition, even among men and women who study the same areas, female respondents are less likely than males to indicate that they engage in large amounts of numeracy skill use in their current occupations.
- These findings point to myriad ways in which PIAAC data might be used in the future to respond to research questions about gender and work.

Adult Education and Training Programs for Older Adults in the U.S.: National Results and Cross-National Comparisons Using PIAAC Data

Phyllis Cummins, Suzanne Kunkel, and Ryan Walker

Continuous learning over the life course is necessary to effectively compete in a knowledge-based global economy. Shifts in the age structure of the U.S. labor force combined with increased labor force participation among older adults add to the importance of gaining a good understanding of how adult education and training (AET) influences labor market outcomes for middle-aged and older workers. This study used data from the Program for the International Assessment of Adult Competencies (PIAAC) and the Survey of Consumer Finances (SCF) to examine the relationship between participation in AET programs and employment, labor force participation, income, and net worth for adults aged 45 to 65 in the U.S. Participation in an AET program in the 12 months preceding the survey significantly improved the log odds of both employment and labor force participation and significantly improved the log odds of moving up one income quintile. Lower income groups and the unemployed were less likely to participate in AET than higher income groups and the employed. Females and those with lower levels of education were more likely to have poorer outcomes in employment, labor force participation, and income as compared to males and the more highly educated. Non-participation by lower-income groups and females may result from lack of affordability and lack of knowledge about the benefits of continuous learning over the life course. Affordable AET opportunities for low-income groups and females might increase participation rates and improve labor market outcomes. Outreach programs that inform individuals about the benefits of AET participation and flexible scheduling, including evening and distance learning programs, might also increase participation among all income groups.

We also compared outcomes of AET participation in the U.S. with those in Germany, Japan, Sweden, and the U.K. and examined policies for lifelong learning in those countries. Each country recognizes the need for individuals to remain in the labor force at older ages and also the importance of lifelong learning to maintain a skilled workforce. Consistent with the U.S., lower-income groups are less likely to participate in adult education programs as compared to higher income groups. Implementing programs that facilitate AET participation by lower income groups has generally been a challenge for policy makers.

Policies that provide opportunities for older adults to participate in AET programs are necessary to ensure economic security in retirement, a competitive labor force, and economic growth. Implementation of policies that focus on lower income groups and the unemployed, who are likely the most in need of skill upgrades and most at risk for economic insecurity in retirement, are especially important. This will likely involve additional funding for public programs, such as the Senior Community Services Employment Program (SCSEP) or the Workforce Innovation and Opportunity Act (WIOA). Outreach programs are necessary to provide unemployed workers a better understanding of the importance of remaining in the labor force to ensure financial security in retirement. Examples of policies to encourage participation in AET include tax credits for AET expenses, lifelong learning accounts, incumbent worker training programs, and publicly sponsored training programs for low-income and unemployed workers. Policies that support a shared responsibility by the government, the individual, and employers are key but how the costs are shared needs to vary by income level so the most in need have low- or no-cost opportunities for AET.

Digital Inclusion and Digital Literacy in the United States: A Portrait from PIAAC

Stephen Reder

This paper uses U.S. data from the Survey of Adult Skills (PIAAC) to explore a digital inclusion pathway leading from digital access to digital literacy. Multivariate models are used to analyze two major sets of issues: (1) digital equity along the inclusion pathway, and (2) the embedding of digital literacy in a range of economic and social outcomes.

The digital inclusion framework adopted by the paper offers a nuanced view of digital equity to reveal distinct patterns and issues facing groups based on gender, race/ethnicity and national origin. In terms of gender, there is a consistent lack of digital equity across the inclusion pathway, with women having higher levels of access, readiness and taste yet lower assessed PSTRE proficiencies than men. There are no gender differences in adjusted ICT use outside of work.

Different patterns of digital equity are evident in groups based on race/ethnicity and national origin. Foreign-born, Black and Hispanic adults have lower adjusted levels of digital access, readiness and taste and lower adjusted PSTRE proficiencies. Black and Hispanic adults have *higher* adjusted levels of ICT use in non-work settings, whereas foreign-born adults and women experience digital equity in their ICT use outside of work. Policies and programs that are effective at engaging adults with using technology may not necessarily be as effective in facilitating their acquisition of digital literacy. “Practice oriented” or “contextualized” instructional approaches may be more effective with some learners than “proficiency-oriented” or “skills-based” approaches.

Digital literacy – measured by both problem solving in technology-rich environments (PSTRE) and use of ICT in workplace and non-workplace settings – is embedded differently in the various economic and social outcomes examined. Digital literacy is embedded in the earnings of prime age workers but not in the employment status of prime age adults. The finding that use of ICT at work is embedded in earnings but workers’ use of ICT *outside* of the workplace is not suggests that different policies and approaches may be needed for teaching digital literacy in an employment search or job development context than in incumbent worker contexts.

Further insights about incumbent worker technology training may follow from better understanding of the finding that ICT use in the workplace is embedded in workers’ earnings but their ICT use outside of work is not. The consistent embedding of ICT use outside of work (but not PSTRE proficiency) in all of the social outcomes examined – social trust, volunteerism, political efficacy and health – may indicate promising policy and program directions for blending support of technology access and use with other social aims and initiatives.

Many of these findings need further testing and elaboration through additional secondary analyses of PIAAC data, both in the U.S. and cross-nationally. Cross-national comparisons of the digital embedding models and comparison of the embedding of digital literacy with other proficiencies and skill use measures are high priority. These could be complemented by new studies that gather PIAAC-compatible data along with other research data, using the soon-to-be-released Education and Skills Online assessments.

Adult Transitions to Learning in the USA: What Do PIAAC Survey Results Tell Us?

Margaret Becker Patterson and Usha G. Paulson

The PIAAC *Survey of Adult Skills* assessed the literacy, numeracy, and technology-related skills of adults age 16 to 65 in 24 countries. An initial finding from the US PIAAC assessment data was that skill levels of US adults are well below the international average and vary substantially according to education background (Kis & Field, 2013). A question remains: do adults continue to learn purposefully – through formal or non-formal learning opportunities – and how does purposeful learning relate to their education levels?

The term purposeful learning is used to differentiate adult learning in formal or non-formal settings from learning which is informal and often self-directed (not collected in PIAAC). Formal learning is offered by an education or training institution, such as a college, and is structured in terms of learning time and objectives. Non-formal learning, refers to structured, organized learning activities outside formal education, such as in the workplace.

Learners were defined as those who reported formal or non-formal learning in the 12 months before PIAAC assessment; adults who reported participating in neither are described as Non-Learners. Adults were classified into 3 categories based on the highest education level they reported completing: Less than High School (LHS), High School (HS), and Postsecondary (PSE).

- **An estimated 80 million LHS and HS adults are in the pool for formal learning: 48.3 million LHS and HS adults were Non-Learners; an additional 31.2 million LHS and HS Learners pursued only non-formal learning**
- LHS and HS Non-Learners tended to have low incomes (< \$36,000 annually), and faced barriers associated with visual or hearing difficulties and learning disabilities at higher rates than Learners; overall, Non-Learners were older (median 45-49 years) than Learners
- The percentage of female Learners increased and the percentage of male Learners decreased with higher education levels
- **All Learners had substantially higher mean scores in Literacy, Numeracy, and Problem-Solving in Technology-Rich Environments than did Non-Learners**
- Non-Learners tended to have lower rates of employment, be out of the labor force more frequently, and to have higher rates of NEET (i.e., not employed nor in education) and permanent disability than Learners
- Both Non-Learners and Learners had similar rates of job satisfaction
- Learners experienced more job mobility within a five-year period than Non-Learners
- **Approximately 2/3 of Learners pursued non-formal learning**
- Learners pursuing non-formal learning participated in OJT most often, followed by seminars or workshops; the reason Learners most often gave for participating in non-formal learning was to do their job better or improve career prospects
- **Even though they have the most need for employer support for learning, especially formal learning, LHS and HS Learners received the least employer support**

Adults' Readiness to Learn as a Predictor of Literacy Skills

M. Cecil Smith, Amy D. Rose, Jovita Ross-Gordon, and Thomas J. Smith

THE STUDY: investigated adults' readiness to learn, drawing upon data from the 2013 Program for the International Assessment of Adult Competencies (PIAAC) Survey of Adult Skills, to address six research questions regarding the extent to which adults' readiness to learn (RtL) predicts adults' literacy and numeracy skills, skills for problem-solving in technology-rich environments, and uses of these and other skills at home and at work. The study also examined both the mediating and moderating effects of RtL on the relationships between several demographic variables -- age, gender, educational attainment, and work experience -- and literacy skills outcomes and skill uses. The investigation focused on RtL among U.S. adults (N = 5,010 adults) ages 16-65 that participated in the PIAAC study. Regression analyses were carried out using RtL as a predictor of both adult skill levels and uses of these skills.

FINDINGS: RtL was not a strong predictor of adult skill levels, but was a statistically significant predictor of adults' use of skills -- particularly skill use in home settings. Additionally, RtL partially mediated the effects of age, education, and work experience on skill levels, and also partially mediated the effect of education on the use of these skills. Further, RtL showed significant moderating effects for age and education on the outcomes of literacy and numeracy; and, RtL moderated the effects of education on several measures of skill use. Increased levels of RtL decreased the positive effect of these demographic predictors. Finally, RtL significantly moderated the effect of gender on adults' use of numeracy skills at work, with increased levels of RtL lessening the gender gap.

DISCUSSION: Readiness to learn appears to be more strongly associated with adults' skill *uses* than with the skills themselves -- particularly for those skills used at home. The contemporary workplace may not leverage adults' readiness to learn, by failing to provide opportunities to fully apply the range of one's skills for work tasks.

IMPLICATIONS: It is important for employers to focus on adult education practices that enhance the readiness to learn of low education workers to ameliorate negative effects of low education on skills and skill uses (e.g., assist adults in transferring skills used at home to the workplace). Employers could devote time during employee orientations to learning what skills, curiosities, and interests new employees bring to the work environment and use this knowledge to assist workers in finding meaningfulness in their work, and encourage the development of robust problem solving approaches.

RECOMMENDED RESEARCH: (1) Additional psychometric data on RtL construct are needed; (2) Examine RtL in relation to other constructs (e.g., employment status, social engagement, skill development, skill use) in diverse settings; (3) More extensive examination of the moderating and mediating effects of RtL on educational level is needed; and, (4) Examine the relationship between readiness to learn and adults' participation in various forms of adult education and training.

What Does PIAAC Tell Us About the Skills and Competencies of Immigrant Adults in the United States?

Jeanne Batalova and Michael Fix

Highlights

The ability to understand, evaluate, and use written information (literacy), to process and communicate mathematical information (numeracy), and to access and use digital technology (problem solving in technology-rich environments) are foundational to full participation in today's knowledge-based societies. This paper employs data from the 2012 Program for the International Assessment of Adult Competencies (PIAAC) to describe the English literacy and numeracy of U.S. immigrant adults and explore how these skills are related to key immigrant integration outcomes such as labor market participation, income, and health status. Our analysis finds that:

- Immigrants lagged U.S.-born adults in terms of literacy and numeracy in English, with both groups scoring below international averages. More than 35 million U.S. adults demonstrated low English literacy proficiency and 58 million had low numeracy skills. U.S. average scores overall were only marginally affected by immigrants' low scores.
- Immigrants were overrepresented among low-skilled adults: While immigrants made up 15 percent of the total U.S. adult 16-65 population, they accounted for 33 percent of adults with low literacy skills and 24 percent of those with low numeracy skills.
- Younger immigrants had stronger skills than older immigrants, while younger natives only barely outperformed their older counterparts.
- Gaps in literacy varied by race and ethnicity: 90 percent of Hispanic immigrants were not proficient in English literacy compared to 39 percent of white immigrants.
- English literacy and numeracy skills of U.S.-born adults from immigrant families (i.e., the second generation) were similar to those of adults from native families, suggesting an intergenerational progress.
- Immigrants arriving in the United States between 2007 and 2011 appear to have similar English literacy and numeracy skills to those who entered earlier, suggesting some rise in newcomers' human capital during the recession.
- Immigrants with U.S.-earned education had English literacy and numeracy scores similar to their U.S.-born counterparts.
- For U.S.-born adults, learning a foreign language as a child does not appear to be an obstacle to English language literacy and numeracy.
- Self-reported data on how well respondents *speak* English correlated closely with PIAAC's directly tested literacy and numeracy skills.
- There was wide variation in the tested proficiency levels of respondents who have been classified as limited English proficient.
- While immigrants were able to find a job regardless of their English literacy and numeracy skills, they needed higher levels of English competencies to be paid well—and on par with natives.
- Both immigrants and natives with low literacy scores were more likely to report poor health.

A Comparative Study of Immigrant and Native Employees in the United States and Canada

William C. Smith and Frank Fernandez

Objective: To explore factors associated with the immigrant wage gap consistently found in both the U.S. and Canada

National Immigration Policy Differences:

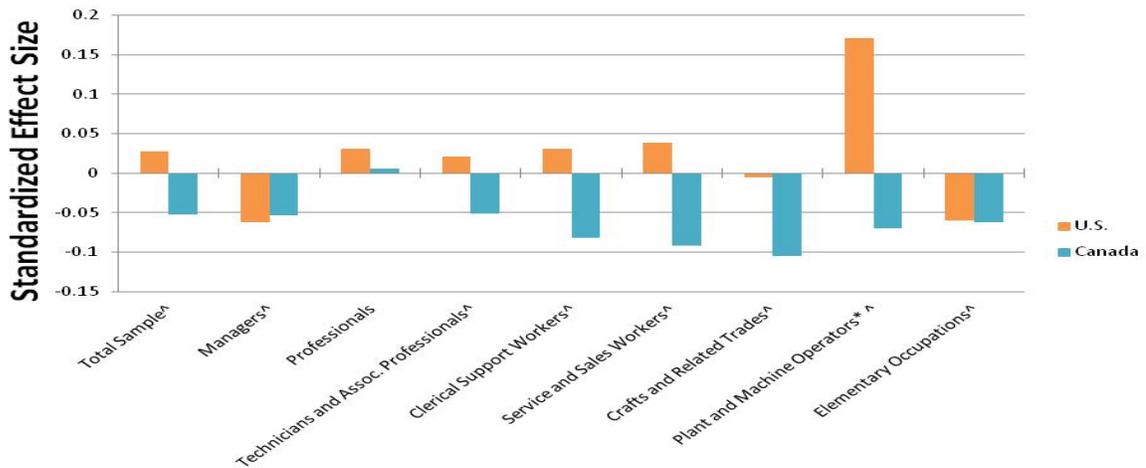
- U.S. – Family Reunification System
 - Majority of documented immigrants are family sponsored; Tend to be younger, less educated and skilled
- Canada – Point Based System
 - Focused on immigrant’s skills and potential contribution to the business community

Potential Factors Related to Immigrant Wage Gap:

- Predictor Variables: Immigrant Status, Years of Education, Literacy & Numeracy Skills
- Control Variables: Years in Position, Hours Worked per Week, Area of Study, ICT Adeptness, Gender, Age

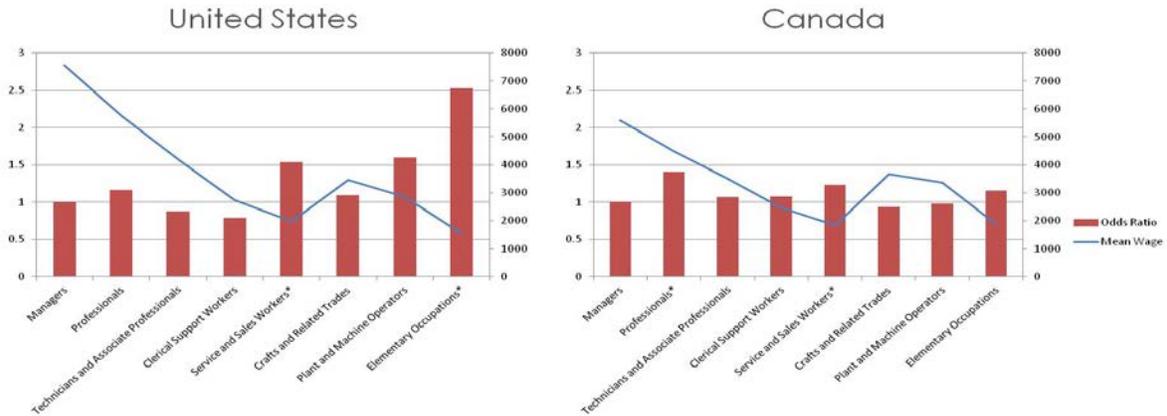
Results:

- Overall Country Sample
 - Initial Immigrant Wage Gap (U.S. = \$282.33; Canada \$233.00)
 - Wage Differential for Complete Model (U.S. ADVANTAGE = \$273.39; Canada GAP = \$333.12)
- By Occupational Field



Implications for the U.S. = Focus on Education:

- Disproportionate concentration of immigrants in low wage fields (see below). Strong relationship between education, skills, and wage in U.S. suggests focus on immigrant achievement gap.



Implications for Canada = Focus on Underemployment:

- Marginal return on education and skills in Canada (especially for immigrants), coupled with the persistent wage gap across occupational fields after all controls are accounted for suggest immigrants in Canada are underemployed. Focus on in-country transition and diversity training.

Examining Associations between Adult Health and Literacy, Numeracy, Technological Problem-Solving Skills, and Post-Initial Learning in the U.S.

Esther Prins, Shannon Monnat, Carol Clymer and Blaire Toso

- **Focus:** Higher educational attainment is strongly associated with better health, but we know far less about how other social determinants, such as literacy and continuing participation in formal and non-formal education, shape health outcomes. This paper uses PIAAC data for U.S. adults to analyze the relationship between respondents' self-reported health and (a) literacy, numeracy, and technological problem-solving skills, and (b) post-initial learning, and to determine whether those relationships vary by race/ethnicity and formal educational attainment. Post-initial learning includes the pursuit of formal and non-formal education and training beyond the respondent's highest level of completed schooling (OECD, 2011).
- **Methods:** The dependent variable is self-rated health (excellent, very good, good, fair, poor). The independent variables were scores on the literacy, numeracy, and problem solving in technology-rich environments (PS-TRE) scales, and five types of post-initial learning during the previous 12 months: open or distance learning courses, workplace training, seminars or workshops, courses or private lessons, and participation in formal education. Ordinal logistic regression models controlled for demographic characteristics that are known to influence health (e.g., age, sex, marital status, health insurance, employment). Sample sizes ranged from 4,647 to 3,664 depending upon the outcome.
- **Results:** Literacy, numeracy, and PS-TRE scores were positively associated with self-rated health. However, after controlling for respondents' characteristics, only literacy was a significant predictor of self-rated health. Specifically, a 10-point increase on the literacy scale was associated with 2.6% greater odds of being in a better health category. Thus, U.S. adults may gain more health benefits from developing literacy than numeracy or technological problem-solving abilities, after accounting for other individual characteristics.
- However, literacy was not among the strongest predictors of self-rated health. Several control variables, including disability, formal educational attainment, health insurance, English proficiency, and nativity (being U.S.- vs. foreign-born), had much stronger relationships with health status. This suggests that to improve U.S. residents' health, basic literacy instruction needs to be accompanied by efforts to increase college attainment, access to health insurance, and English proficiency. These are promising venues for policy intervention.
- In unadjusted models (without control variables), four post-initial learning activities were related to better health: workplace training, seminars/workshops, courses/private lessons, and participation in formal education. After accounting for socio-demographic characteristics, only participation in courses/private lessons was significantly related to health (59% greater odds of reporting better health compared to those who did not participate). More research is needed to understand what these courses entail and how they contribute to health.
- There was no variation in the relationship between self-rated health and literacy, numeracy, PS-TRE skills, or post-initial learning activities by race/ethnicity. This indicates that whites and people of color accrue equal health advantages from strengthening their literacy proficiency and from participating in courses/private lessons. Of all the independent variables, only the relationship between health and PS-TRE skills differed by educational attainment. Our results show that only the most highly educated U.S. adults those with a master's degree or higher—experienced improved health (although very modest) with better PS-TRE skills.

Understanding Health Information Seeking Behaviors of Adults with Low Literacy, Numeracy, and Problem Solving Skills

Iris Feinberg, Daphne Greenberg, and Jan Frijters

Patient-centered care (PCC), in which patients and their providers work together to make decisions about health care and disease management, is considered one of the key components of high-quality healthcare (IOM, 2013). For patients to be able to participate in their own care, they must have adequate functional health literacy, which enables them to use health information in this dyadic communication framework. A critical first step to having functional health literacy is the ability to access and identify information that can be used for the more complex and situational demands of health care. This analysis of PIAAC data looks at how adults with low level skills seek health information. What sources do individuals use when seeking health information? Do different demographics, health behaviors, and facilities in English predict different health information sources for people with low skills in literacy, numeracy, and problem solving?

Our key findings are as follows:

- Health information seeking behaviors are both complex and subtle, and depend on a multitude of factors. One size doesn't fit all as evidenced by varying combinations of background, health behaviors, and facilities in English. People with low level literacy, numeracy, and problem solving skills who seek health information report having better health status than those who do not seek health information.
- People with low level literacy, numeracy, and problem solving skills report that oral sources of communication (Radio/TV, Friends/Family/Co-Workers, Health Professionals) are used more often than written sources (Print Media/Internet). Those with low literacy and numeracy skills seek health information from Radio/TV most often while those with low problem solving skills use the Internet and Health Professionals.
- Having a high facility in writing English is a significant predictor of using the Internet and Health Professionals as a source of health information for those with low level literacy, numeracy, and problem solving skills.
- For people with low levels of literacy, numeracy, and problem solving skills, having a high school diploma is significant when compared to not having a high school diploma only when seeking health information through the Internet or Print Media.

Overall, we learned from the PIAAC data that adults with low skill levels practice varying kinds of health information seeking behaviors from multiple sources. We suggest that different stakeholders have unique roles to play in increasing health information seeking behaviors. Health professionals could develop more focus and skills in oral participatory care with patients and caregivers; the health care industry (pharmaceutical, hospital systems, insurance companies) could simplify and standardize forms and written materials; policy makers could include health literacy at appropriate funding levels for K-12 and Adult Basic Education curricula; and health educators and researchers must develop interventions to address health information seeking behaviors through differing skill levels in multiple modalities.