

Health Insurance Literacy and Low Wage Earners: Why Reading Matters

Iris Feinberg, Georgia State University; Daphne Greenberg, Georgia State University; Elizabeth L. Tighe, Georgia State University; and Michelle Mavreles Ogrodnick, Georgia State University

Abstract

In the United States, worker health care is funded through health insurance plans paid for by employers. Insurance plans are written in complicated language that low wage earners (LWE), who have lower levels of education, may find difficult to understand. We examined the relationship between health insurance literacy (HIL), education, and literacy skills for 75 LWE. Results indicated low to moderate associations between literacies (reading, numeracy, digital), educational attainment and HIL; in a multiple regression analysis, only reading was uniquely significant. LWE with low educational attainment and poor reading skills may need additional support to understand and use their health insurance.

Health literacy is the ability of people to access, understand, and use health information (U.S. Department of Health and Human Services, 2010). Adults with low health literacy have low reading, numeracy, and digital skills which means that they have difficulty reading medication and discharge instructions, following instructions on a prescription bottle, using a table or chart to calculate their insurance deductibles, finding accurate health information on the Internet and/or understanding the concept of risk (America's Health Literacy: Why We Need Accessible Health Information, 2008; Bartholomae, Russell, Braun, & McCoy, 2016; Feinberg, Greenberg, & Frijters, 2015). Low health literacy is correlated with lower levels of educational attainment, higher

use of non-print health information sources (radio or television), and less use of the Internet for accessing health information (Feinberg et al., 2015). Individual health literacy does not exist in a vacuum; rather, it is the interplay between one's individual skills and the health literacy level of information that is provided that can further complicate how individuals access, understand, and use health information (Berkman, Davis, & McCormack, 2010; Rudd, 2015). Differences in culture, ethnicity, language, and social determinants of health such as socioeconomic status also affect an individual's health literacy. Beliefs about health and health care, the meanings of words, access to health care, preferences of language and cultural beliefs all have a

direct relationship on how individuals access, understand, and use health information (Nielsen-Bohlman, Panzer, & Kindig, 2004).

Health insurance literacy (HIL), considered a specialized form of health literacy, has not received wide attention. Although more than 63% of Americans under the age of 65 have health insurance coverage through employer-sponsored insurance plans (Kaiser Family Foundation [KFF], n.d.), it is not clear how many people actually understand the health insurance benefits, costs, or terminology that are described in health insurance documents. The Institute of Medicine (IOM) Health Insurance Literacy Roundtable defines HIL as this lack of understanding, which includes finding and evaluating information, selecting the best plan, and using the plan once enrolled (IOM, 2012).

There is no agreed upon national measure for “adequate” HIL. Both the KFF and American Institutes of Research (AIR) developed HIL surveys to assess knowledge of basic health insurance terms and understanding of insurance concepts including calculating co-pays (KFF, n.d.; Paez et al., 2014). In both cases, these surveys indicated that about 60% of U.S. adults correctly answered these knowledge and skills questions (Norton, Hamel & Brodie, 2014; Paez & Mallory, 2014). The KFF quiz also reports average scores of 4.5 (45% correct) for those who never attended high school to 7.2 (72% correct) for those who have a college degree (KFF Health Insurance Quiz, n.d.).

Health insurance documents are contracts between the insurance company and the policyholder, and as such, are written in complex post-graduate level language to explain the legal powers and liabilities of both parties. This makes insurance documents difficult to read if one does

not understand the special language of health law. People of all literacy levels have difficulty reading and interpreting this complex and often syntactically challenging text. However, for the 1 in 6 Americans who read at elementary levels and the 1 in 3 who perform math at elementary levels, reading and interpreting post-graduate level documents is even more challenging (Brega et al., 2015; Quincy, 2012; OECD, 2013). As a result, many people struggle with reading and understanding health insurance terminology (co-pay, deductible, annual benefit limit) and health services terminology (screening vs diagnostic tests) (Brega et al., 2015; Hardie, Kyanko, Busch, LoSasso & Levin, 2011; Quincy, 2010). Many also have difficulty with numeracy skills which are necessary to understand health insurance; for example, 88% of U.S. adults cannot calculate their share of costs for health insurance from a table and 49% cannot calculate their out of pocket costs for health services (Greene, Peters, Mertz & Hibbard, 2008; Kunter, Greenberg, Jin, & Paulsen, 2006). Further, most insurance offerings are primarily available online, which necessitates the need for individuals to have access to the Internet and proficiency with digital literacy skills (IOM, 2009; Lupton, 2015). Health insurance information is written in a complex specialized language and can be presented in a complicated and confusing manner, and as the complexity and quantity of information increases, consumer confidence in choosing and using health plans decreases (Quincy, 2010). Adults with low literacy and numeracy skills may have more difficulty than others comprehending this complex text.

Appropriate choice and use of health insurance can positively impact health and financial outcomes (Bartholomae et al., 2016; Quincy, 2012). Individuals with high HIL may not only know how to choose health insurance but may also

understand how to use it to help manage health-related costs (e.g., choosing a health provider that is in-network and has a lower cost to the consumer than one that is out-of-network) (Bartholomae et al., 2016; Hoerl et al. 2017). In addition to the knowledge of how to use health insurance services, those with high HIL may be able to more easily find, understand, evaluate, communicate, and calculate the kind of coverage and services they have (Hoerl et al. 2017; Prins, Monnat, Clymer, & Toso, 2015). Knowledge and skills may increase self-confidence in understanding and using health insurance services (Paez et al., 2014; Quincy, 2010).

Employers are the largest provider of health insurance to U.S. working-age adults; through sponsored insurance plans, employers not only provide insurance coverage, but also try to educate employees to identify and choose appropriate health insurance plans. One group of employees that is particularly at risk for having low HIL and thus difficulty choosing, understanding and using health insurance is low-wage earners (LWE). LWE are characterized by the Bureau of Labor Statistics (BLS) as blue collar, service, personal care, maintenance, health support, or administrative support employees who often have average annual incomes at or below the United States median 2016 salary of \$43,992 (BLS, n.d.). They are likely to be nonwhite, have a high school diploma or less, report lower health status and more chronic diseases, have low health-information seeking skills or knowledge, have low digital skills to access online insurance forms and information, and are likely to not be able to meet the literacy demands of health-related programs (IOM, n.d.; Levitt, 2015). LWE are also more likely to exhibit risky health behaviors despite having employer-sponsored health insurance (Harris, Huang, Hannon, & Williams, 2011).

Research Questions

There is a paucity of research about LWE and HIL; much of the research in the last 5 years has been on newly-eligible insured populations (through the Affordable Care Act). This exploratory study seeks to answer the following questions:

1. What is the relationship between literacies (reading, numeracy, digital), educational attainment, and HIL for LWE?
2. Do educational attainment, reading, numeracy, and digital skills account for shared and unique variance in HIL for LWE?

Method

Participants

The participants were 75 individuals who were employed full-time by an urban Southeastern public university in the United States and were not part of a union or collective bargaining unit. All participants were English-speaking individuals from the facilities management, custodial, and security departments. All participants had job titles whose full-time wages met the definition of LWE (below United States median 2016 salary of \$43,992). They were recruited at 10 regularly scheduled departmental meetings (supervisors were not present during recruitment) with approximately 150 people total in the meetings. Ninety people expressed an interest to participate, with 75 actually enrolling and completing the assessments.

Materials

Demographic survey. We gathered information on age, gender, race, and educational attainment through an interview. See Appendix for demographic questions.

Reading and math. The Wide Range Aptitude Test-4 (WRAT-4), used in health literacy studies to correlate low literacy skills with low health literacy, (Bass, Wilson & Griffith, 2003; Davis, Kennen, Gazmararian, & Williams, 2005), is normed on children and adults up to age 94 (Wilkinson & Robertson, 2006). These commonly-used reading and math tests for adults (Mullen & Fouty, 2014) are easy to administer and score and provide a significant amount of information in a relatively brief testing time. We used these tests to measure general reading skills which are needed to understand all kinds of documents including health insurance documents. The Word Reading subtest is a list of 33 words ordered from easier to harder. This subtest measures an individual's ability to read words through letter identification and word recognition. Reliability reported in the technical test manual is .86 (Wilkinson & Robertson, 2006) and a Cronbach's alpha coefficient of .97 for our sample.

The total of words read correctly indicates the beginning point of the next reading test, Sentence Comprehension, which is a cloze assessment in which participants silently read sentences and provide the missing words. The test manual has criteria for correct responses as well as a sample of incorrect responses. Testers can use the prompt "can you be more specific?" when unsure of a participant response. This test measures an individual's ability to gain meaning from words and comprehend information contained in sentences. Reliability reported in the technical test manual is .78 (Wilkinson & Robertson, 2006) and a Cronbach's alpha coefficient of .97 for our sample.

Math Computation subtest is a paper-and-pencil test which measures an individual's ability to count, identify numbers, solve simple problems, and calculate written math problems. The test consists of two pages of math calculations in no

order of difficulty; participants begin at whichever question they choose. Reliability reported in the technical test manual is .94 (Wilkinson & Robertson, 2006) and a Cronbach's alpha coefficient of .92 for our sample.

Digital literacy. Digital literacy was measured using the Northstar Digital Literacy Test, World Wide Web Module (Northstar Digital Literacy, n.d.). This module contains the skills used to access the Internet, create forms online, and move between web pages. There are 33 questions that are answered on the computer and it takes approximately 15 minutes to complete. Reliability for this module is not reported. Our sample exhibited a Cronbach's alpha coefficient of .87.

Health insurance literacy. HIL was measured using the KFF Health Insurance Literacy Ten-Question Quiz (KFF, n.d.). This assessment measures how much people know about health insurance terms, concepts, and how to calculate out-of-pocket expenses in different scenarios. The KFF quiz takes approximately 10 minutes to complete. Reliability for this measure is not reported. Our sample exhibited a Cronbach's alpha coefficient of .42.

Procedures

Testing was conducted by trained research assistants in a private room in the university during a two-hour session. Before taking the assessments, all participants signed informed consent according to the university's Institutional Review Board. Participants received \$20 per hour as remuneration for participating in the study. The demographic survey was read to participants and data were recorded by a trained research assistant into a Qualtrics database on a laptop. Participants were given response cards for race and educational attainment and were asked to select the category of best fit.

The WRAT-4 Word Reading, Sentence Comprehension and Math Computation subtests were administered next; each of the tests was administered individually. Testers were trained according to the general administration guidelines in the WRAT-4 professional manual which includes practicing administration of the test, not sharing test items with participants until formal testing begins and not sharing correct or incorrect responses (Wilkinson & Robertson, 2006). For the Word Reading subtest, all participants were given a word reading list which contained letters and words. The tester had a scoring sheet that mirrored the participant word reading list and followed along as the participant read the words, recording which words were read correctly. Participants started at the first item of the second section; if they did not answer the first five questions on the second part correctly, the tester went back to the first section and administered those items. If the participant answered the first five items in the second part correctly, the participant continued in the second section until he/she hit a ceiling of 10 consecutive incorrect words.

The Sentence Comprehension sub-test followed the Word Reading sub-test. Prior to the actual test, the tester reviewed two sample items with the participant. Then, the participant silently read the sentence from the Sentence Comprehension Card and gave an oral response to fill in the missing word. Each participant continued until he/she hit a ceiling of seven consecutive incorrect answers. The tester used a scoring form to record answers. The next subtest to be administered was Math. The participant was given 15 minutes to complete as many questions as possible on the test form. He/she could not use a calculator but was given a

piece of scratch paper to use as needed.

The Digital Literacy Test was given online on a laptop supplied by the researcher.

Testers and participants worked on a sample question together to ensure that the participant understood how questions were asked, what the answer prompts were, and how to use the online system to move between screens and go to the next question.

The testing session concluded with the HIL measure. It included ten questions which were read out loud by a tester; response cards were given to the participant. The tester also read the answers on the response cards to the participants. The participants were given scratch paper and a pencil to perform the calculations required on two of the 10 questions.

Results

As indicated in Table 1, participants ranged in age from 18-65, with a mean age of 43.6 ($SD = 12.2$). Fifty-two percent were female ($n = 39$). Most of the participants were Black or African-American (89%); the remaining were White (11%). Slightly over half (57%; $n = 43$) of the participants only had a high school diploma or equivalency degree or less.

All measures were examined for normality assumptions; skew and kurtosis values all fell within the acceptable range (± 2). Across all participants and variables, six univariate outliers were identified and adjusted to within two interquartile ranges¹. Additionally, we examined bivariate scatterplots and did not observe any additional outliers.

¹ At the request of a Reviewer, we performed a sensitivity analysis, in which results were compared with and without adjusting for the six univariate outliers. Results were comparable, and therefore, we chose to report our original results with the six adjusted outliers.

Table 1: Demographic Characteristics (n=75)

	N	%	RANGE	MEAN (SD)
Age	75		18-65	43.8 (12.2)
Gender				
• Male	36	48%		
• Female	39	52%		
Race				
• White	8	11%		
• Black or African-American	67	89%		
• Hispanic	0	0%		
• Other	0	0%		
Educational Attainment				
• Less than High School	4	5%		
• High School Diploma/Equivalency Degree	39	52%		
• Technical Certificate	5	7%		
• Some College	13	17%		
• Associates Degree	4	5%		
• Bachelor's Degree	10	14%		
• Don't Know/No Response	0	0%		

As indicated in Table 2, participants performed below the high school level on all of the WRAT-4 subtests. With regard to digital literacy only one participant scored high enough to receive a certificate of competency (score 14.4) issued by the Northstar Digital Literacy organization (Northstar Digital Literacy, n.d.). The Kaiser Family Foundation reports health literacy average national scores from 4.5 correct items for those who never attended college to 7.2 for those who are college graduates; our participants' mean raw score was 4.7, which is minimally above the level of those who never attended college (KFF, n.d.).

To answer our first research question, regarding the relation between literacies (reading, numeracy, digital), educational attainment, and HIL for LWE, correlational analyses were run using SPSS Version 24 (IBM Corp, 2016). Correlations computed using pairwise as well as listwise deletion between all measures are presented in Table 3. The correlations between literacies (reading, numeracy, digital), educational attainment, and HIL were low to moderate. All other correlations were moderately to strongly, positively associated ($ps < .01$). Of note, is the strikingly high correlation between WRAT Reading and Math ($r = .91$).

Table 2: Literacy Measures

DESCRIPTION (n=75)	RANGE	MEAN RAW SCORES (sd)	GRADE EQUIVALENT
WRAT Word Reading	2-55	48.8 (13.5)	7.8
WRAT Sentence Comprehension	0-43	35.5 (11.8)	10.1
WRAT Math Computation	0-37	34.9 (7.9)	6.6
Digital Literacy	0-17	12.6 (4.1)	--
Health Insurance Literacy	1-9	4.7 (1.7)	--

Note: The maximum possible raw score for each measure are as follows: 70 for WRAT-Word Reading, 50 for WRAT Sentence Comprehension, 40 for WRAT Math Computation, 18 for Digital Literacy, 10 for Health Insurance Literacy.

Table 3: Correlations Between All Measures

MEASURE	1	2	3	4	5
1. WRAT Reading	.91**	.69**	.68**	.45**	
2. WRAT Math	.91**	--	.63**	.71**	.40**
3. Digital Literacy	.69**	.63**	--	.56**	.31**
4. Edu Attainment	.68**	.71**	.56**	--	.41**
5. Health Insurance Literacy	.45**	.40**	.31**	.41**	--

Note: Correlations above the diagonal were computed using pairwise deletion (N ranges from 70-75). Correlations below the diagonal were computed using listwise deletion ($N = 70$). **All significant at $p < .01$.

To address our second research question regarding the predictive relations of educational attainment, reading, numeracy, and digital skills to HIL for LWE, a multiple regression analysis was conducted using SPSS Version 24 (IBM Corp, 2016). This analysis included four predictors (WRAT Reading, WRAT Math, Digital Literacy, and educational attainment) and HIL was the outcome ($F[4, 65] = 4.748, p = .002$; see Table 4).

Jointly, the four predictors accounted for 22.6% of the variance in HIL. WRAT Reading was the only significant unique predictor ($\beta = .59, p = .049$; $R^2 = .048$). Cumulatively, the model suggests that reading skills are the strongest predictors of HIL outcomes².

We also ran a second, exploratory multiple regression analysis in which we included demographics (gender, age, educational

² Given the high correlation between WRAT Reading and Math ($r = .91$), we also ran these predictors in separate models (alongside the other two predictors of educational attainment and Digital Literacy). The same pattern of findings was observed, only reading was a unique predictor beyond other included variables in the model. Thus, the high correlation between reading and math does not suggest that reading is obscuring the predictive relation of math to HIL outcomes.

attainment) and the only significant, unique predictor from our previous model (WRAT Reading) as predictors of HIL ($F[4, 67] = 5.044, p = .001$; see Table 5). We were unable to control for age and gender in our previous model because of the small sample size ($N = 75$), and thus, we wanted

to examine whether WRAT Reading remained a significant predictor after accounting for additional demographics. Jointly, these predictors accounted for 23.1% of the variance in HIL. WRAT Reading remained the only significant unique predictor ($\beta = .38, p = .009; R^2 = .082$).

Table 4: Multiple Literacies and Educational Attainment Predicting Health Insurance Literacy

PREDICTOR	COEFFICIENT	SE	t-VALUE	p-VALUE	UNIQUE R^2
Reading	.585	.291	2.010	.049	.048
Math	-.256	.291	-.882	.381	--
Digital Lit	-.031	.153	-.203	.839	--
Edu Level	.193	.156	1.234	.222	--

Note: We only report unique R^2 estimates (based on Type II sums of squares) for significant predictors.

Table 5: Demographics and Reading Predicting Health Insurance Literacy

PREDICTOR	COEFFICIENT	SE	t-VALUE	p-VALUE	UNIQUE R^2
Reading	.383	.143	2.674	.009	.082
Gender	-.077	.110	-.699	.487	--
Age	.069	.111	.624	.535	--
Edu Level	.162	.141	1.145	.256	--

Note: We only report unique R^2 estimates (based on Type II sums of squares) for significant predictors.

Discussion

Having health insurance does not mitigate the effects of low health literacy or low HIL; according to the National Assessment of Adult Literacy, only 12% of individuals with employer-sponsored insurance have proficient health literacy (Kutner et al., 2006). Having employer-sponsored health insurance does not mean that individuals understand insurance terminology, understand how to select the best insurance coverage for

themselves and their family, know what they have to pay for emergency room or office visits, prescription drugs, or to meet their deductible (Barnes & Hanoch, 2017; Bartholomae et al., 2016; Lowenstein et al., 2013). Adequate HIL allows an individual to have the confidence, ability, and knowledge to find and evaluate information about health plans, choose the best plan for their financial and health circumstances, and use that plan once enrolled (Quincy, 2012).

Very little extant literature studies the contribution of individual literacy skills and/or educational attainment to HIL. In our study, we examined the relationships between HIL, educational attainment, reading, math, and digital skills for LWE who have employer-sponsored insurance to better understand what contributes to HIL. Results indicate that reading skills may be a better indicator of HIL outcomes than math and digital literacy skills. Consumers enroll for health insurance on an annual basis; those with low reading skills may not be able to make informed decisions in choosing the most appropriate health plan for themselves or their family. Insurance terminology is complex and poor readers may not be able to understand either the terms or their use in insurance documents. Employers do not know the reading skill levels of their employees, but they do have educational attainment level. While research indicates that educational attainment is not always a great predictor of reading level (e.g., Miller, Greenberg, Hendrick, & Nanda, 2017), the correlation in this study between educational attainment and reading scores suggests that employers may want to consider giving additional support especially to those employees who only have a high school diploma or less, and who are trying to make decisions about employer-sponsored health insurance.

There are several limitations in this study. First, the study design included a small sample size of 75 LWE in a single employee setting, limiting generalizability. In addition, the small sample size precluded us from considering educational attainment in terms of less than a high school diploma versus a high school diploma (or comparing several categories from less than high school to completing postsecondary and beyond education). Second, the moderate to strong correlations among the literacy-based constructs

($r_s=.63-.91$) created some suppression effects (as seen by the negative beta weight estimates for math and digital literacy; Table 4), which warrant further investigation. Third, we measured only one element of numeracy (calculations), which limited the broader understanding of numeracy and risk as it relates to the selection and use of health insurance. Fourth, as reported, the reliability of the HIL measure was low for our sample. We were not able to locate studies that utilized this direct skills assessment measure. For example, we considered using the HIL measure developed by the American Institutes of Research as it covers some of these constructs, however, this measure is a self-reported behavior scale, and we were interested in directly measuring knowledge and skills when using health insurance. Further research needs to be conducted to analyze whether the KFF Health Insurance Literacy Ten-Question Quiz (KFF, n.d.) should be used to measure HIL in larger samples with various levels of literacy skill.

Additionally, our variables were limited to performance-based measures and did not consider socio-ecological factors such as genetics, biology, language, socio-economic status, beliefs, and attitudes. These factors interact with the social context of family, culture, community, the health care system, and entrenched disparities (Anker, Reinhart, & Feeley, 2011; Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011). Health needs also change across the life span, as does the need for health literacy and HIL (Manafu & Wong, 2012; Nutbeam, 1999; Sambamoorthi & McAlpine, 2003). We believe incorporating socio-ecological factors is important for future studies.

Finally, we did not consider choice architecture in this study. Choice architecture refers to how individual choices are influenced by the way information is presented (Thaler & Sunstein,

2008). Different employer or insurer tactics include setting defaults (make no selection and default to the prior year's health plan), framing (making some choices appear more positive or negative) or adding numerous options (too many choices to carefully consider) (Barnes & Hanoch, 2017; Thaler & Sunstein, 2008). Considering how to structure choices for adults with low reading and educational attainment may make understanding and using health insurance easier.

Implications of the Study

This study has practical implications for both employers and for the adult education system. We provide recommendations for each. While we address adults with low literacy skills in our recommendations, we believe that these recommendations are appropriate for adults of all literacy levels who need to access, understand, and use health insurance documents.

Recommendations for Employers

LWE with poor reading skills may have an easier time understanding health insurance in face-to-face conversation rather than having to read lengthy documents (National Academies of Sciences, Engineering, and Medicine [NASEM], 2017). Human Resource personnel should take care to explain complex health insurance concepts using everyday terminology. In one study, 100% of consumers preferred the word "doctor" over "primary care provider" or "health care professional" (NASEM, 2017). Further, there is an immense amount of information that is presented in health insurance documents. It is recognized that much of the information that is written in these documents must be included due to legal requirements. However, by using plain language, simple numerical examples, and streamlining the actual plan, challenges faced by the employee can

be reduced. Using plain language and meaningful visuals that help convey the main message are often helpful for adults with low reading skills. Some examples include using headings and bullets to break up text (White, 2012). White space and a simple font that is at least 12 points often makes text easier to read (White, 2012). Other elements of plain language include using common words, sticking to a few main points, using short sentences, and using an active voice (CDC, 2017). Associating numerical information with visuals can be helpful; numbers need to be interpreted in order to be meaningful, and often are difficult to understand if they require computation or are without a broader context (IOM, 2014).

While the actual health insurance documents may not be able to be changed, providing employees with enrollment information that is in plain language and with simplified text, numbers, and visuals can help employees with low literacy skills better understand health insurance terminology and their choice options (Bartholomae et al., 2016). These materials include outreach and informational materials, health insurance plan information and application forms. Further, face to face discussions about health insurance options can be helpful for many employees. The number of health plan options and the decisions to be made within those options can also be challenging for employees with low literacy skills. Some methods to improve the decision-making environment for employees are reducing the number of insurance options, presenting choices in some order of value, creating meaningful defaults, and/or providing standardized coverage options (Barnes & Hanoch, 2017; Johnson et al., 2012).

Recommendations for Adult Education Practitioners

Adult education practitioners can also help their

students by using health insurance documents as examples of authentic material to use in class. An “Explanation of Benefits” received from an insurance company that shows how much they have paid and how much the patient/student owes for health care services is a good example of a common health document that is laden with terminology that adult students with low literacy skills may not understand. An adult education teacher can help students decipher and understand hard to read words like co-insurance and deductible. As another example, insurance companies provide a “Statement of Benefits” to describe what is covered under an individual’s health insurance plan. This document can be used to help adult students learn how their health coverage works by becoming familiar with the words and what they mean. Since not all “Statements of Benefits” will look the same, students could work with their own documents at home and bring them to class to describe and discuss their individual health insurance coverage. There are also organization websites such as the Center for Disease Control (cdc.gov) and the U.S. Centers for Medicare and Medicaid Services (health.gov) that are written in a health-literate format for adults with low reading skills and can be used by classroom teachers.

In terms of numeracy, the numeracy skills required to understand health insurance are complex, and include skills such as basic calculations and computation (frequency, percentage, inference), analytical (reading tables or graphs, estimating uncertainty), statistical (risk, probability) and decision-based numeracy skills (seeking information, attending to numeric information in a chart or graph, recalling numeric information, and the affective meaning attached to numeric information) (Apter et al., 2008; Peters, 2012). Adult education practitioners should

consider covering diverse numeracy skills in their classrooms, as well as applying them to authentic tasks such as health insurance forms. Specifically, in addition to performing simple calculations, individuals must be able to competently read and understand numbers and mathematical operations in the context of phrases and paragraphs, complex graphical displays, and unfamiliar text-heavy documents. With regard to digital literacy skills, instructors can help students learn how to access authentic health materials and information on the Internet and guide them to easier-to-read websites. A challenge for adults with low skills can be knowing which websites contain credible information.

Conclusion

Health care expenses are the largest and fastest growing employee-related expense for businesses in the United States (Society for Human Resource Development, 2017). Human Resource professionals are often charged with managing those health care costs through a variety of strategies including creating consumer-directed health plans (e.g., health savings accounts), offering wellness programs, and offering multiple choices of health plans. Many employees take advantage of these flexible insurance offerings, however, LWE with poor reading skills are less likely to be able to access, understand, and use these programs because they may have trouble with even basic health insurance terms and concepts. It is important for Human Resource practitioners to give additional support to LWE, and for adult education practitioners to teach the types of information needed to be able to understand and complete health insurance forms.

Appendix

Demographic Questions

1. How old are you?
2. Are you a man or woman?
3. How would you describe yourself:
 - a. White
 - b. African American
 - c. Asian
 - d. Other
4. What is the highest level of education you've received?
 - a. Less than high school
 - b. High School Diploma
 - c. GED
 - d. Technical Certificate
 - e. Some College
 - f. Associates Degree
 - g. Bachelor's Degree
 - h. Don't Know/No Response

References

- America's health literacy: Why we need accessible health information. An Issue brief from the U.S. Department of Health and Human Services. (2008). Retrieved from: <https://health.gov/communication/literacy/issuebrief/#non>
- Anker, A., Reinhart, A., & Feeley, T. (2011). Health information seeking: A review of measures and methods. *Patient Education and Counseling, 108*, 294-301.
- Apter A.J., Paasche-Orlow M.K., Remillard J.T., Bennett I.M., Ben-Joseph E.P., Batista R.M., Hyde J., & Rudd R.E. (2008). Numeracy and communication with patients: They are counting on us. *Journal of General Internal Medicine, 23*, 2117-2124.
- Barnes, A. and Hanoach, Y., (2017). Knowledge and understanding of health insurance: Challenges and remedies. *Israeli Journal of Health Policy Research, 6*(40), doi: 10.1186/s13584-017-0163-2
- Bartholomae, S., Russell, M, Braun, B, & McCoy, T. (2016). Building health insurance literacy: Evidence from the Smart Choice Health Insurance Program. *Journal of Family Economic Issues, 37*, 140-155.
- Bass, P., Wilson, J., and Griffith, C. (2003). A shortened instrument for literacy screening. *Journal of General Internal Medicine, 18*(12), 1036-1038. doi: 10.1111/j.1525-1497.2003.10651.x
- Berkman, N., Davis, T. & McCormack, L. (2010). Health literacy: What is it? *Journal of Health Communication, 15*, 9-19.
- Berkman, N., Sheridan, S., Donahue, K., Halpern, D., & Crotty, K. (2011). Low health literacy and health outcomes: An updated systematic review. *Annals of Internal Medicine, 155*, 97-107.
- Bhargava, S., Lowenstein, G., & Snyder, J. (2015). *Do individuals make sensible health insurance decisions? Evidence from a menu with dominated options (Working Paper No. 21160)*. Retrieved from: <https://www.cmu.edu/dietrich/sds/docs/bhargava/w21160.pdf>, November 15, 2018.
- Brega, A., Freedman, M, LeBlanc, W, Barnard, J, Mabachi, N, Cifuentes, M, West, D. (2015). Using the health literacy universal precautions toolkit to improve the quality of patient materials. *Journal of Health Communication, 20*(sup2), 69-76.
- Bureau of Labor Statistics (n.d.), U.S. Department of Labor, Occupational Outlook Handbook, Table 1. Median usual weekly earnings of full-time wage and salary workers by sex, quarterly averages, seasonally adjusted; on the Internet at <https://www.bls.gov/news.release/wkyeng.t01.htm> (visited October 31, 2018).
- Centers for Disease Control and Prevention (2017), U.S. Department of Health and Human Services, Plain language communication; on the Internet at <https://www.cdc.gov/healthliteracy/developmaterials/plain-language-communication.html> (visited November 12, 2018).
- Davis, T., Kennen, E., Gazmararian, J., and Williams, M. (2005). Literacy testing in health care research. In J.G. Schwartzberg, J.B. VanGeest, & C.C. Wang (Eds.), *Understanding health literacy: Implications for medicine and public health* (pp. 157-179). United States of America: AMA Press.
- Feinberg I., Greenberg D., & Frijters J. (2015). Understanding health information seeking behaviors of adults with low literacy, numeracy, and problem solving skills: Results from the 2012 US PIAAC Study. Retrieved from http://static1.squarespace.com/static/51bb74b8e4b0139570ddf020/t/54da7889e4b004762df45b52/1423603849970/Feinberg_Greenberg_Frijters_PIAAC.pdf
- Greene, J., Peters, E., Mertz, C., & Hibbard, J. (2008). Comprehension and choice of a consumer-directed health plan: An experimental study. *American Journal of Managed Care, 14*(6), 369-379.
- Hardie, N., Kyanko, K, Busch, S, LoSasso, A, & Levin, R. (2011). Health literacy and health care spending and utilization in a consumer-driven health plan. *Journal of Health Communication, 16*(3), 308-321.

- Harris, J., Huang, Y., Hannon, P., & Williams, B. (2011). Low-socioeconomic status workers: Their health risks and how to reach them. *Occupational and Environmental Medicine*, 53(2), 327-342.
- Hoerl, M., Wupperman, A., Barcellos, S., Bauhoff, S., Winter, J., & Carman, K. (2017). Knowledge as a predictor of insurance coverage under the affordable care act. *Medical Care*, 55(4), 428-435. doi 10.1097/MLR.0000000000000671
- IBM Corp. (2016). *IBM SPSS Statistics for Macintosh*, Version 24.0. Armonk, NY: IBM Corp.
- Institute of Medicine. (2009). *Roundtable on health literacy, ehealth and communication: Putting the consumer first*. Washington, DC: National Academies Press.
- Institute of Medicine. (2012). *Measuring health insurance literacy: A call to action*. Washington, DC: IOM.
- Institute of Medicine. (2014). *Health literacy and numeracy: Workshop summary*. Washington, DC: IOM.
- Institute of Medicine Committee on Health and Behavior (n.d.). *Health and behavior: The interplay of biological, behavioral and societal influences*. Washington, DC: IOM.
- Johnson, E., Shu S., Dellaert, B., Fox, C., Goldstein, D., Häubl, G., Larrick, R., Payne, J., Peters, E., Schkade, D., Wansink, B., Weber, E (2012). Beyond nudges: tools of a choice architecture. *Marketing Letters*, 23, 487-504.
- Kaiser Family Foundation. (n.d.). Health Insurance Coverage of the Total Population. (n/d/). Retrieved from <https://www.kff.org/other/state-indicator/total-population/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>
- Kaiser Family Foundation Health Insurance Quiz. (n.d.). Retrieved November 27, 2016, from <http://kff.org/quiz/health-insurance-quiz/>
- Kutner, M., Greenberg, E., Jin, Y., & Paulsen, C. (2006). *The health literacy of America's adults: Results from the 2003 National Assessment of Adult Literacy*. U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Department of Education.
- Levitt, L. (2015). Why health insurance literacy matters. *Journal of the American Medical Association*, 313(6), 555-556.
- Lowenstein, G., Friedman, J., McGill, B., Ahmad, S., Linck, S., Sinkula, S., ... Volpp, K. (2013). Consumers' misunderstanding of health insurance. *Journal of Health Economics* 32 (5), 850-862. doi.org/10.1016/j.jhealeco.2013.04.004
- Lupton, D. (2015). Health promotion in the digital era: A critical commentary. *Health Promotion International*, 30(1), 174-183.
- Manafa, E., & Wong, S. (2012). Health literacy programs for older adults: A systematic literature review. *Health Education Research*, 1-14.
- Miller, C., Greenberg, D., Hendrick, R., Nanda, A. (2017). Educational attainment: Limited implications for adult literacy learners. *Journal of Research and Practice for Adult Literacy, Secondary, and Basic Education*, 6, 21-36.
- Mullen, C. and Fouty, H. (2014). Comparison of the WRAT4 Reading Subtest and the WTAR For estimating premorbid ability level. *Applied Neuropsychology: Adult*, 21, 69-72. doi: 10.1080/09084282.2012.727111
- National Academies of Sciences, Engineering, and Medicine. (2017). *Health insurance and insights from health literacy: Helping consumers understand: Proceedings of a workshop*. Washington, DC: The National Academies Press. doi: 10.17226/24664.
- Nielsen-Bohlman, L., Panzer, A., & Kindig, D. (Eds.). (2004). *Health literacy: A prescription to end confusion*. Washington, DC: National Academies Press.
- Northstar Digital Literacy (n.d.). Retrieved December 2, 2016 from <https://www.digitalliteracyassessment.org/>.
- Norton, M., Hamel, L., & Brodie, M. (2014). Assessing Americans' familiarity with health insurance terms and concepts. Retrieved from www.kff.org/health-reform/poll-finding/assessing-americans-familiarity-with-health-insurance-terms-and-concepts/.
- Nutbeam, D. (1999). Literacies across the lifespan: Health literacy. *Literacy and Numeracy Studies*, 9(2), 47-55.

- OECD (2013). *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills*. OECD Publishing.
- Paez, K. & Mallery, C. (2014). *A little knowledge is a risky thing: Wide gap in what people think they know about health insurance and what they actually know (AIR Issue Brief)*. Retrieved from https://airpce.org/sites/default/files/11801-451-05_Issue_Brief_102014.pdf.
- Paez, K., Mallory, C., Noel, H., Pugliese, C., McSorley, V., Lucado, J., & Ganachari, D. (2014). Development of the Health Insurance Literacy Measure (HILM): Conceptualizing and measuring consumer ability to choose and use private health insurance. *Journal of Health Communication, 19*(sup2), 225-239.
- Peters E. (2012) Beyond comprehension: The role of numeracy in judgments and decisions. *Current Directions in Psychological Science, 21*, 31–35.
- Prins, E., Monnat, S, Clymer, C, & Toso, B. (2015). How is health related to literacy, numeracy and technological problem-solving skills among U.S. adults? Evidence from the Program for the International Assessment of Adult Competencies (PIAAC). *Journal of Research and Practice for Adult Literacy, Secondary and Basic Education, 4*(3), 22-42.
- Rudd, R. (2015). The evolving concept of health literacy: New directions for health literacy studies. *Journal of Health Communication, 8*(1), p. 7-9.
- Quincy, L. (2010). *Early consumer testing of new health insurance disclosure forms*. Washington, DC: Consumers Union and People Talk Research.
- Quincy, L. (2012). *Measuring health insurance literacy: A call to action*. Washington, DC: Consumers Union and Kleinman Communication Group.
- Sambamoorthi, U. & McAlpine, D. (2003). Racial ethnic, socioeconomic, and access disparities in the use of preventive services among women. *Preventive Medicine, 37*(5), 475-484.
- Society for Human Resource Management. (2017). *Managing health care costs*. Retrieved from: <https://www.shrm.org/resourcesandtools/tools-and-samples/toolkits/pages/managinghealthcarecosts.aspx>
- Thaler, R. H., & Sunstein, C. (2008). *Nudge: Improving decisions about health, wealth, and happiness*. New Haven, CT: Yale University Press.
- U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2010). *National Action Plan to Improve Health Literacy*. Washington, DC: retrieved from https://health.gov/communication/hlactionplan/pdf/Health_Literacy_Action_Plan.pdf
- Wilkinson, G. & Robertson, G. (2006). *Wide range achievement test – fourth edition: Professional manual*. Lutz, FL: Psychological Assessment Resources.
- White, S. (2012). Mining the text: 34 text features that can ease or obstruct text comprehension and use. *Literacy Research and Instruction, 51*(2), 143-164.