Designing Occupational Safety and Health Training Materials for Clear Communication

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Introduction: Printed materials are an essential part of occupational safety and health programs. Public health professionals at the Centers for Disease Control and Prevention (CDC) have created a Clear Communication Index (CCI) to guide design of health education materials for the general public. **Methods:** We revised an existing handout on heat exposure hazards in construction using the CCI and tested the old and new versions of the handout with an audience of 425 construction apprentices and journey-level workers. **Results:** Some features recommended by the CCI—such as the use of subheadings, numbering, and other visual cues—strongly conditioned the readers' understanding of the main message. **Conclusions:** Design and layout have a significant impact on the delivery of messages in written materials. A communications-based rubric such as the CCI can help writers preparing written occupational safety and health materials for workers and general audiences.

Keywords: Clear Communication Index, construction, hazard communication, health communication, health literacy, occupational health, occupational safety, training

Written materials, whether shared online or in print, remain a fundamental building block for occupational safety and health training programs. A 2015 survey of 319 construction safety professionals and safety trainers found that 62% had used handouts or brochures during the previous month.[1] However, written materials can only be effective if the intended audience understands their content.

The construction labor force is diverse, with a broad range of literacy skills. A substantial fraction of that labor force has low English-language literacy, attributable to limited educational attainment, limited English language skills, or other factors. US Census surveys have found that more than one out of five (21%) construction industry workers age 25 or over lacked a high school degree, and that more than one in four (26.7%) spoke a language other than English at home.[2,3] The 2003 National Assessment of Adult Literacy found that 23% of construction and extraction workers had "Below Basic" literacy skills, limited to "locating easily identifiable information in short, commonplace prose texts."[4]

Occupational safety and health researchers and practitioners have long recognized the challenges of delivering safety and health education to workers who may have low literacy or limited English capabilities.[5–7]

Communication researchers have generated a series of tools and instruments to help writers develop clear and simple written materials accessible to readers with a wide range of literacy skills. Informed by communication science, these rubrics guide health educators in evidence-based techniques for delivering messages clearly and effectively. In 1985, Doak et al,[8] introduced the suitability assessment of materials (SAM) in the first edition of Teaching Patients with Low Literacy Skills. The SAM offered a simple rubric with a checklist of 22 items directing writers of health education materials to write at a reading level suitable to their audience, use the active voice, describe clear and specific behaviors, and use subheadings, bullet points, illustrations, and culturally appropriate references to enhance comprehension. The completed SAM yields an overall score of 1 to 100 for each material assessed, with materials scored 0 to 39 rated "not suitable," 40 to 69 "adequate," and 70 to 100 "superior."

More recently, health communications researchers at the Centers for Disease Control and Prevention (CDC) created a new rubric-based tool to guide health writers, the "Clear Communication Index" or CCI.[9,10] While similar to the SAM, the CCI is not specific to low-literacy audiences and incorporates findings from health communications research published since Teaching Patients with Low Literacy Skills. Writers using the CCI to guide publication design begin by identifying their primary audience and its literacy skills, their communication objective, and their main message. Relying on their answers to these questions, the writer or reviewer responds to up to 19 items with a "yes" or "no." For instance, the CCI asks, "Is the main message at the top, beginning, or front of the material?" and "Does the material always use language the primary audience would use?" The answers generate an overall score between 0 and 100. If the material scores 90 or above, it is considered suitable for use with the intended audience. If the material scores 89 or below, the writer is urged to revise the material until it scores 90+.

In recent years, researchers have used the CCI to assess the suitability and clarity of patient education materials for sickle cell disease,[11] the National Comprehensive Cancer Network Patient Guidelines,[12] Wikipedia pages on neurosurgical topics,[13] Environmental Protection Agency water quality reports,[14] patient health care portals,[15] internet information on mengiomas,[16] and materials promoting reduced consumption of sugary beverages.[17] These studies almost invariably found that materials in use fell short of the recommended 90+ score on the CCI, with typical scores ranging between the 40s and the 70s.

However, few studies have tested the efficacy of materials prepared or revised using the CCI. In 2014, Baur and Prue[9] identified three online CDC materials designed to provide the public with information on cellphones and health, heart disease, and the use thimerosal in vaccines, each of which scored less than 30% on the index. After revising them to score above 90 on the CCI, consumer testing found that readers of the revised materials understood the new materials better, and were more likely to identify the

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Clinical Significance: Clear written communication with general audiences is essential both to occupational safety and health professionals in the workplace and to clinicians engaged in patient education. The CCI can help practitioners in both groups select or create materials that meet these qualifications. In particular, the use of numbering, informative subheadings, bold print and illustrations cues readers to pay special attention to key points.

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authors' main message successfully. Similarly, a Japanese research team found that reformatted materials on depression using the CCI were preferred by participants and the revised messages were more likely to be read than the orginals.[18]

A previous study tested construction occupational safety and health materials in current use for readability and suitability using a variety of readability and suitability testing instruments, including the CCI. The study found that most of the materials in use for construction worker training fell short of the CCI's passing score of 90.[19] The aim of the current study is to determine whether use of the CCI can make construction safety and health materials accessible and comprehensible to a larger part of a construction worker audience.

METHODS AND MATERIALS

An existing training handout addressing heat hazards in construction was submitted to a National Institute for Occupational Safety and Health communications professional for review and scoring using the CCI (Fig. 1). The handout received an initial

Heat Stress in Construction

Hazard Alert

THE CENTER TO PROTECT WORKERS' RIGHTS CPWR

Heat is a serious hazard in construction. Your body builds up heat when you work and sweats to get rid of extra heat. But sometimes your body may not cool off fast enough. This can happen, say, if you are up on a roof pouring hot asphalt or you are lifting heavy loads.

Too much heat can make you tired, hurt your job performance, and increase your chance of injury. You can get skin rash. You can also get:

- **Dehydration.** When your body loses water, you can't cool off fast enough. You feel thirsty and weak.
- **Cramps.** You can get muscle cramps from the heat even after you leave work.
- **Heat exhaustion.** You feel tired, nauseous, headachy, and giddy (dizzy and silly). Your skin is damp and looks muddy or flushed. You may faint.
- **Heat stroke.** You may have hot dry skin and a high temperature. Or you may feel confused. You may have convulsions or become unconscious. **Heat stroke can kill you** unless you get emergency medical help.

The Risk of Heat Stress

Your risk of heat stress depends on many things. These include:

- Your physical condition
- The weather (temperature, humidity)
- How much clothing you have on
- How fast you must move or how much weight you must lift
- If you are near a fan or there is a breeze
- If you are in the sun.

If there is an industrial hygienist on your work site, ask the hygienist about the Wet-Bulb Globe Temperature Index. It is a more precise way to estimate the risk of heat stress.

FIGURE 1. Heat stress in construction. Hazard alert.

score of 50, with the reviewer noting that while the handout employed many design techniques recommended in the CCI, such as the use of informative subheadings, bullet points, and words the audience used, the handout did not begin with a clear statement of one main message and lacked visual cues that would help the reader identify the main message. The handout was revised according to the CCI criteria to create a new handout (Fig. 2) that passed the CCI threshold of 90+, designed to convey the message ''Each year, thousands of workers get sick from heat exhaustion or heat stroke. But you can protect yourself by dressing for hot conditions and taking frequent breaks for water and shade.'' This main message contained five distinct elements: (1) heat is hazardous/dangerous to your health, but (2) you can protect yourself (3) by dressing for the weather, (4) drinking water, and (5) taking frequent breaks in shaded or cooled areas.

A questionnaire for readers was developed, adapting questions from the earlier Baur and Prue study after multiple rounds of pilot testing. The questionnaire included basic demographic information, including age, race/ethnicity, education, and language spoken at home. In addition, several items asked the participants to evaluate the handout they received, asking about its clarity, ease of use, and effectiveness. Some were yes/no questions, and others were statements asking participants to respond on a seven-point Likert scale ranging from ''Strongly Agree'' to ''Strongly Disagree.''

The form also included two short-answer questions to test whether the audience had identified and understood the most essential information: ''What is the MAIN MESSAGE of the handout?'' and ''What does the writer want you to DO?'' For the short-answer questions, the authors separately evaluated the responses and recorded whether each of the five elements was referenced in their answers. Each author reviewed all of the responses, after which they met and reconciled their answers. The reconciled answers were used for data analysis.

Two joint-labor management apprenticeship centers in the upper Midwest affiliated with the International Union of Painters and Allied Trades (IUPAT) agreed to administer the testing with apprentices and journey-level workers participating in a variety of classroom-based vocational training classes in fall 2018. Classes were randomly assigned to review either the old or the revised handout. Instructors distributed to each student a copy of one of the two handouts and the blank paper questionnaire. Students were informed that the purpose of the study was to improve the quality of occupational safety and health training materials, that participation was voluntary and did not affect their grade in the class, and that their participation would be anonymous. On completion, the instructors collected the handouts and questionnaires and returned them to the research team.

Our primary hypothesis holds that the new handout, revised using the CCI, outperformed the old handout: that is, that participants who received the new handout reported fewer difficulties in comprehension and were better able to identify the handout's main message elements. Our alternative hypothesis holds that the longer, old handout outperformed the new, revised handout. Our null hypothesis holds that the there was no statistically significant difference between the performance of the new and old handouts.

To test our hypotheses, we converted each survey item into a simple yes-no proposition, reporting back the raw percentage of yes responses for each version of the handout and using a chi-square (χ^2) test to identify when that difference was statistically significant. We also considered the possibility that individual participants' industry experience or English-language reading ability could affect their comprehension of the material and serve as possible confounders. To guard against this, participants were asked to report several demographic characteristics that could serve as proxies for experience and English-language literacy: age, years in the industry, whether they were apprentices or journey-level workers, race/ethnicity, high school diploma, and language spoken at home, and conducted a logistic regression controlling for these factors.

RESULTS

The study population consisted of 425 union apprentice and journeyman painters, drywall finishers, glaziers, and related occupations (see Table 1). The typical participant was a 29-year-old male apprentice with 5 years of experience in the industry. Roughly half the participants (51%) were non-Hispanic Whites, and more than one-third (35%) Hispanic. A quarter of the participants reported speaking a language other than English at home. Nearly all the participants reported having graduated high school.

We received 421 usable responses, 221 from recipients of the old handout and 200 from recipients of the new handout. Recipients of the old handout were more likely to identify at least one factor that made it harder to understand (see Table 2). In particular, the old handout suffered from a lack of visual elements (pictures, charts, tables) and use of confusing words. Although the new handout seemed easier to understand, those receiving the new handout were more likely to say it contained too little information. On the remaining items, there was no statistically significant difference between the responses of the two groups.

Of the four statements presented to the participants (see Table 3), both handouts performed well, earning scores above 90%. We found no significant differences for three statements. On the fourth, although the difference in raw scores was not large, new handout readers were more likely to agree or strongly agree that their handout ''told me what to do about heat hazards in construction.''

The short-answer questions, which asked readers to identify the main message of the handout, probed how well the elements of the key message were delivered and understood (see Fig. 3). Although both handouts covered the five main points the authors sought to convey, the difference between the responses was pronounced. As seen in Fig. 2, readers of the old handout were substantially more likely to cite ''heat is dangerous'' or ''heat is hazardous to your health'' than readers of the new handout, one of the few areas where the old handout outperformed the new one. However, they were less likely to cite the action elements in the message: they were somewhat less likely to include ''protect yourself'' in their answers and far less likely to mention the three essential steps or behaviors promoted in the handout. Those who received the new handout mentioned taking frequent water and rest breaks three times more often than those who received the old one, and they mentioned dressing in light-colored, breathable clothes four times as often. Each of the respondents who mentioned all five elements in their answers had received the new handout. On each of these criteria, the new, revised handout outperformed the old.

Results of the logistic regression analyses indicate that readers of the new handout were more likely to say the handout contained too little information, told me what to do about heat hazards, and better conveyed the message protect yourself than readers of the old handout, but these results were not statistically significant. On several of the survey items, however, the new handout outperformed the old at a statistically significant level. New handout recipients were significantly less likely to report that any features interfered with their understanding of the document, especially a lack of pictures and charts and confusing words, and significantly more likely to mention all five key actions steps, including dressing in proper clothing, drinking water frequently, and taking breaks in shaded areas. Finally, on one survey item, the old card outperformed the new: those who received the old handout were significantly more likely to cite the heat is a hazard message when describing the contents. The odds ratios and level of statistical significance are reported in Tables 4 and 5.

HAZARD ALERT

CPWR

WORKING IN HOT WEATHER

Am I in danger?

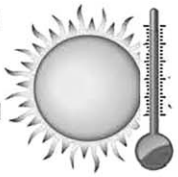
OSHA says that each year, thousands of workers get sick from heat exhaustion or heat stroke. **Some even die.**

You are at risk if you:

- Work in hot and humid conditions;
- Do heavy physical labor; and
- Don't drink enough water.

This risk is greater for workers who are not used to the heat.

But you can protect yourself *and* feel better as you work by dressing for hot conditions and taking frequent breaks for water and shade.



What to look for...

Signs of **Heat Exhaustion:**

- Weakness and wet skin
- Headache, dizziness or fainting
- Nausea or vomiting

Signs of **Heat Stroke:**

- Confusion or fainting
- May stop sweating – dry, hot skin
- Convulsions or seizures

Get help if you or a co-worker has these signs. HEAT STROKE IS A MEDICAL EMERGENCY. IT CAN BE DEADLY. If a co-worker shows signs of heat stroke, **call 911**.

If you think you are in danger:
Contact your supervisor.
Contact your union.
Call OSHA
1-800-321-OSHA

Protect yourself ...

1 Dress for hot conditions

Wear clothes that are:

- Light-colored (white, etc.)
- Loose-fitting
- Lightweight

Wearing heavy protective clothing or personal protective equipment may increase your risk you may need more frequent breaks for rest and water.

PHOTO COURTESY OF CAL-OSHA

2 Drink Water

Drink water every 15 minutes when working in hot conditions.

DO NOT wait until you are thirsty to drink water.
DO NOT drink alcohol and **AVOID** caffeine.

PHOTO COURTESY OF NEIL LIPPY

3 Take Breaks

Take frequent rest breaks in shaded, cooled or air-conditioned areas.

If you see a co-worker with symptoms of **Heat Exhaustion**, speak up.

If you see a co-worker with symptoms of **Heat Stroke**, seek medical attention immediately!

Your employer should:

- Have a heat illness prevention program and emergency plan.
- Provide training on heat hazards and steps to prevent heat-related illnesses.
- Provide clean, cool water – about 4 cups (that's two 16-ounce bottles) each hour.
- Schedule frequent breaks in shaded or cooled areas.
- Gradually increase workloads for workers new to the heat.

Learn more about
heat-related illnesses and
how to prevent them at
http://bit.ly/CPWRHotWeather
To receive copies of this Hazard Alert and cards on other topics
Call 301-578-8500

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Illustrations courtesy of CAL-OSHA

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FIGURE 2. Working in hot weather.

TABLE 1. Population Demographics ($n = 425$)

Mean age	28.8 ± 0.37
Mean years in trade	5.1 ± 0.28
Apprentices/Journey workers	95% Apprentices (385) 5% Journey workers (20)
High school graduate?	99% yes (396) 2% no (6)
Gender	92% male (373) 8% female (32)
Race/Ethnicity	51% White, non-Hispanic (202) 35% Hispanic (137) 6% Black, non-Hispanic (25) 8% other (30)
Language spoken at home	75% English only (264) 25% another language (87)

Table values are mean ± SD for continuous variables and column % (*n*) for categorical variables. Values may not add up to 100% due to rounding; *n* may not add up to 425 due to missing values.

DISCUSSION

Overall, despite a large difference in CCI scores, the handout revised using the CCI only modestly outperformed the original. Why were the results less dramatic than those found by Baur and Prue?[9] Several factors may have played a role. Heat is a familiar hazard in construction and the audience may have brought a baseline knowledge to the exercise. Furthermore, the original document already had incorporated many of the good practices promoted in the CCI, such as using informative subheadings to emphasize key points and short bullet-pointed lists to break up large blocks of text, leaving less room for improvement. Finally, we might expect the simple and clear messaging promoted by the CCI to have the greatest benefit for those with the weakest reading skills. The study population proved to be substantially better educated than the workforce as a whole: after all, admission to an apprenticeship program requires a high school diploma or General Educational Development. Moreover, though many in the audience spoke another language at home, participants had sufficiently strong English to participate in an English-language apprenticeship curriculum. Even under these conditions, however, readers who received the revised document were less likely to indicate a problem with unfamiliar or confusing words, or to cite factors making the handout difficult to understand. The use of images to illustrate key behaviors seemed especially important in this regard.

Although the differences captured in the subjective evaluation questions were relatively small, responses to the short-answer questions revealed that readers understood the two handouts quite differently. The writers wanted construction workers reading the handout to understand and remember that ''each year, thousands of workers get sick from heat exhaustion or heat stroke. But you can protect yourself by dressing for hot conditions and taking frequent breaks for water and shade.'' Participants who received the original document zeroed in on the first element—that heat is an occupational hazard in construction—but often neglected the action messages. Readers who received the new handout were far more likely to mention the specific actions one could take to do so.

These findings are readily explained by the layout and design of the two handouts. The original document was a simple, two-sided handout packed with information. Although the text was broken into sections with subtitles, employed bullet points freely, and made some use of bold print to highlight key points, the 516-word document contained no illustrations. Information was presented in a narrative format: first, announcing that heat is an occupational hazard and exploring its health effects; then, the environmental and work conditions that pose the greatest risk; finally, on the reverse side, the steps workers could can take to protect themselves.

TABLE 2. Factors that Got in the Way of Understanding the Handout

Question (Yes/No)	Old Handout ($n = 221$)	New Handout ($n = 200$)	*P*-Value
Did this handout contain any unfamiliar words or phrases? (% yes)	7.9% (17)	4.0% (8)	0.102
Did any of these nine factors get in the way of getting the information you needed? (% checking yes to any of the nine factors listed below)**	22.2% (49)	12.5% (25)	0.009
No pictures, charts or tables**	14.9% (33)	0.5% (1)	<0.001
Too much information	4.1% (9)	3.5% (7)	0.759
Confusing words*	4.1% (9)	0.5% (1)	0.016
Small font	3.2% (7)	1.0% (2)	0.125
No clear purpose	1.8% (4)	0.5% (1)	0.215
I couldn't tell who this was written for	0.9% (2)	1.0% (2)	0.920
Too little information*	0.9% (2)	5.0% (10)	0.012
No headings	0.0% (0)	0.0% (0)	N/A
Confusing numbers	0.0% (0)	0.0% (0)	N/A

*Significant at $P < 0.05$.
**Significant at $P < 0.01$ (χ^2).

TABLE 3. Statements About the Handout

Statement	Old Handout ($n = 221$)	New Handout ($n = 200$)	*P*-Value
Do you agree or disagree with these statements about the handout? (% Strongly agree or agree)			
This handout answered my questions about heat hazards in construction	93.2% (206)	90.0% (180)	0.233
This handout told me what to do about heat hazards in construction*	90.5% (200)	96.5% (193)	0.014
It was easy to find the information I need about heat hazards in this handout	92.3% (204)	94.0% (188)	0.494
This handout had the right amount of information about heat hazards for me	90.5% (199)	88.0% (176)	0.502

*Significant at $P < 0.05$ (χ^2).

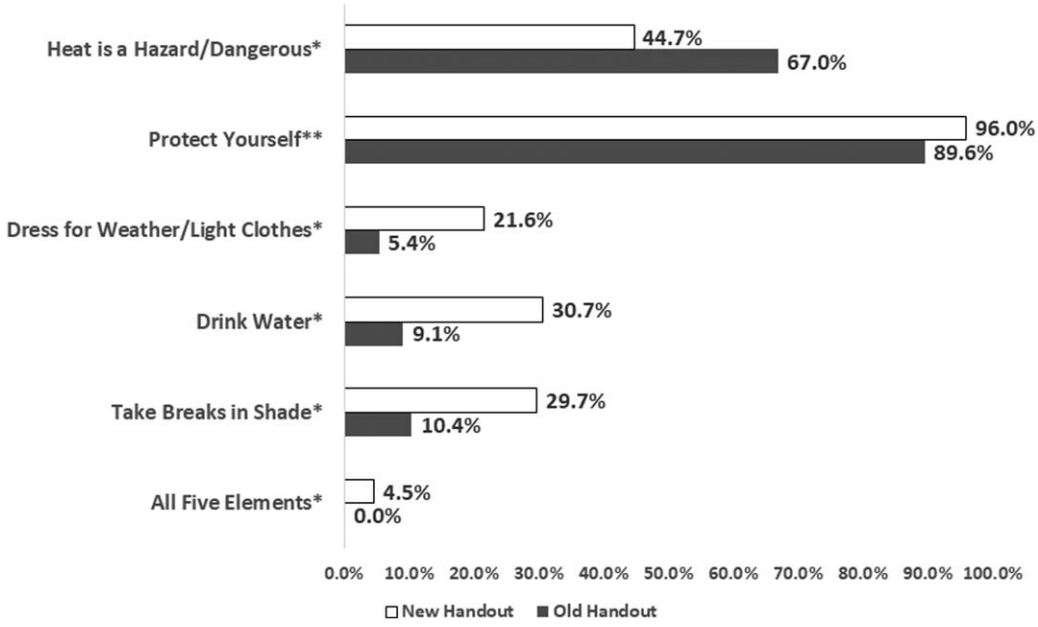

FIGURE 3. Respondents mentioning each message element in their short answers.

TABLE 4. Multiple Logistic Regression: Questions and Statements

	Variable	Adjusted OR[a] (95% CI)	*P*-Value
Did any of these nine factors get in the way of getting the information you needed?	Old card	1.00	
	New card	0.47 (0.24–0.89)	0.02
No pictures, charts or tables	Old card	1.00	
	New card	0.06 (0.01–0.29)	0.0004
Confusing words	Old card	1.00	
	New card	0.09 (0.01–0.88)	0.04
Too little information	Old card	1.00	
	New card	3.46 (0.97–12.37)	0.06
This handout told me what to do about heat hazards in construction (strongly agree/agree)	Old card	1.00	
	New card	2.23 (0.91–5.49)	0.08

[a]Adjusted for age, years in the industry, whether they were an apprentice or journey worker, race/ethnicity, whether they earned a high school diploma, and language spoken at home.

TABLE 5. Multiple Logistic Regression: Key Message Elements

Key Message Element	Variable	Adjusted OR[a] (95% CI)	*P*-Value
Heat is a hazard/dangerous	Old card	1.00	
	New card	0.36 (0.23–0.57)	<0.0001
Protect yourself	Old card	1.00	
	New card	2.26 (0.93–5.51)	0.07
Dress for weather/light clothes	Old card	1.00	
	New card	4.57 (2.20–9.50)	<0.0001
Drink water	Old card	1.00	
	New card	4.62 (2.48–8.61)	<0.0001
Take breaks in shade	Old card	1.00	
	New card	3.72 (2.06–6.71)	<0.0001
All five elements	Old card	1.00	
	New card	16.97 (1.78–161.78)	0.01

[a]Adjusted for age, years in the industry, whether they were an apprentice or journey worker, race/ethnicity, whether they earned a high school diploma, and language spoken at home.

The revised handout adopted several important evidence-based techniques that help readers identify and understand the most important information. For example, rather than a narrative structure, the new handout began with a statement of the main message with its elements indicated in bold print. The new handout contained three numbered panels, each explaining one of the behaviors recommended in the main message. To reinforce the message, these panels were illustrated with images of construction workers performing the recommended behaviors. (Two additional panels provided important supplemental information on first aid for victims of heat stroke and heat exhaustion and on the responsibility of employers to provide water and shaded rest areas, similarly illustrated). The new handout had room for illustrations because the authors had removed details extraneous to the main audience of construction workers, such as information on the wet-bulb globe temperature index, leaving only 355 words of carefully chosen text. The authors were also careful to substitute words construction workers use for technical terms and jargon whenever possible.

For readers in general, the layout and structure of the handout seem to have exerted a powerful influence on how they understood the handout's purpose and what messages they received and retained. Information that is placed first in a document conditions what the reader will focus on as he or she continues; similarly, when a piece of information is reinforced by bold print, a graphic illustration, or its own subheading, readers are more likely to consider it important. Readers who received the original document, whose introduction focused exclusively on heat as a hazard, certainly received this message. In addition, many—especially when prompted by the ''What does the author want you to do?'' question—mentioned the ''protect yourself'' message, which the original handout used as a subheading. But very few mentioned the three concrete behaviors the authors sought to promote.

Readers of the new handout, which began with a statement of the main message, also readily identified the ''protect yourself'' message element, which was a prominent visual feature in the handout. A substantial number of them also referenced one or more of the concrete behaviors workers could use to protect themselves. Each of these had been introduced in the first panel using bold print and was then reinforced by its own subtitle and illustration. And by cutting away inessential material, readers were less likely to be distracted or led astray from the main points—as in the case of a respondent who read the old handout and answered ''What does the author want you to do?'' with ''Ask about [the] wet-bulb globe temperature index.''

As noted in the introduction, the construction workforce contains a substantial minority of high school non-completers and immigrants who speak English as a second language; materials must be carefully designed if they are to be accessible to these workers. Our raw results show that even in a study population above average in these characteristics, some found the old format challenging. Nearly 8% reported that the original hazard alert contained unfamiliar words and phrases; one in 10 did not recognize that ''protect yourself'' was part of the main message and did not agree with the statement that ''this handout told me what to do about heat hazards in construction.'' Nearly 13% of those receiving the old handout said the absence of pictures, charts, and tables made the content hard to understand, and all told more than 22% identified one of the nine major factors as an obstacle to understanding. The new handout performed better on all of these indicators.

There was some evidence of another, smaller minority of readers that wanted more information than the new handout provided. Readers of the old handout were somewhat more likely to agree with the statement that ''this handout answered my questions about heat hazards in construction,'' although this difference was not statistically significant. More importantly, 5% of those who received the new handout indicated that it contained ''too little information,'' compared with only 0.9% of the readers who received the old handout. That said, the authors believe that making critical safety information accessible to those with limited English-language literacy should take priority in occupational safety and health training, as these workers are often at disproportionate risk of injury.[20–23]

LIMITATIONS

As noted above, the study participants were almost all high-school graduates and had sufficient command of English to participate in a vocational training program, a sample that may have excluded members of the construction workforce most in need of clear and simple messaging. Moreover, the original document already incorporated several of the evidence-based communications practices recommended in the CCI, such as employing short blocks of text with informative subtitles and bulleted lists, and the participants may have brought considerable background knowledge of heat hazards to the study. Consequently, it is likely that this study has underestimated the potential benefits of using the CCI when writing worker-oriented materials for construction occupational safety and health training. Finally, all participants in the study were members of a single construction trade and union; findings may not be representative of all industries or even all construction occupations.

CONCLUSIONS

The layout, design, structure, and presentation of information in written materials have powerful effects on the reader's understanding of the message. Readers tend to focus on information placed in the start of a document, or highlighted by the use of subtitles, numbering, bullet points, bold print, and accompanying images. It is important for writers to identify key messages they wish to deliver before they begin writing and use these techniques to convey their importance to the reader. The CCI can help writers incorporate these and other evidence-based best communications practices in their written materials. Supplemented by testing with members of the intended audience, the CCI can be a useful resource for preparing written occupational safety and health training materials.

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