Guidelines for Minimizing the Complexity of Text

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Problem Statement: Centers for Disease Control and Prevention (CDC) has created many COVID-19 materials for the public. Unfortunately, the complexity of these materials is beyond the reading comprehension level of many people with intellectual and developmental disabilities and others who read or listen with comprehension below a third-grade level.

Proposed Solution: To address this problem, the Center for Literacy and Disability Studies of the Department of Allied Health Sciences, School of Medicine at the University of North Carolina at Chapel Hill, working with the Center for Inclusive Design and Innovation at the Georgia Institute of Technology, developed authoring guidelines to revise CDC materials. The guidelines aim to make the materials understandable to people who read at or below a third-grade level, especially individuals with intellectual and developmental disability.

Process: Work began with a scoping review of the literature. The review involved a search of electronic databases including PsychInfo, MEDLINE, ERIC, CINAHL, Health Source: Nursing/Academic Edition, and Education Full Text for records published within the last 10 years. The array databases were selected to yield results from various subject areas.

The first search used the terms "plain language" and "simplified text." Next, "text complexity" was added because this term is more closely tied to research on reducing text difficulty at the lowest text comprehension levels. The use of these search terms resulted in 1,304 records that were then uploaded to Covidence, a type of software designed to streamline systematic reviews. Each was then screened for relevance to the problem at the title and abstract level, and 92 records that related specifically to supporting text comprehension were retained. The remaining 1,212 records were excluded. The 92 retained records were then reviewed at the full-text level for appropriate recommendations. The search process is illustrated in Figure 1.

Figure 1
Summary of Review Results
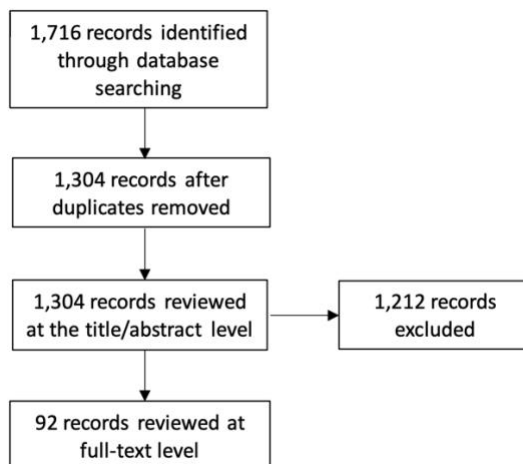
In addition to this review, the team at the Center for Literacy and Disability Studies drew upon work regarding text complexity and beginning readers that was conducted by Cunningham et al. (2005) and Schuster and Erickson (2014).

The review of the resulting records indicated that Plain Language (https://plainlanguage.gov/) is a necessary precondition of simplifying text, but it is insufficient to ensure comprehension for people with text comprehension skills below the sixth-grade level. As a result, the Minimized Text Complexity Guidelines include recommendations drawn from research on reducing text complexity for people who read at beginning levels (i.e., at or below the third-grade level) that extend well beyond Plain Language guidelines.

To determine the guidelines for formatting and graphic elements, a systematic review of research was conducted and the *Text Simplification Guidelines* compiled by SNOW Inclusive Learning and Education were consulted. The SNOW guidelines are a consolidation of accessibility guidelines in Section 508 of the Rehabilitation Act of 1973, Web Content Accessibility Guidelines, Authoring Tool Accessibility Guidelines, and the Accessible Digital Office Documents Project.

The guidelines were reviewed by three subject matter experts external to the project. This review led to minor revisions to wording and the inclusion of additional references. Finally, the Minimized Text Complexity Guidelines were subjected to message testing by a group of individuals in the target population. This work was conducted by the Center for Inclusive Design and Innovation at the Georgia Institute of Technology.

Guidelines: The following list of guidelines resulted from this series of reviews. Please note the version date in the footer, as our intention is to continue to test and refine the guidelines in an iterative process (Hadden, 2015; Kushalnagar et al., 2018) to make the CDC documents understandable to people with disabilities who read at beginning levels (i.e., at or below the 3rd-grade level) and make the final set of guidelines as broadly applicable as possible.

Minimized Text Complexity Guidelines

Whole Text-Level Guidelines
- Ensure that the document presents information that is directly relevant to the lives of the intended audience [1].
- Ensure that the document has a clear, singular focus to reduce text density [2,3,4].
    - Identify and parse key concepts into separate sections or separate documents with single levels of meaning [5].
- Minimize the overall length of the document as much as possible [6].
- Write in the active voice [7,8].
    - Example:
        - Passive: The tests will be conducted by a trained assistant.
        - Active: A trained assistant will conduct the tests.
- Write headings as informative statements [3] and use them to organize documents around salient content/key concepts [3,9].
    - Try to limit headings to 8 words.
    - Example:
        - Original: What is the difference between Influenza (Flu) and COVID-19?
        - Revised: The Difference Between Flu and COVID-19
- Maximize cohesion in the text (i.e., the ways that words and sentences work together) through the repetition of content words from sentence to sentence [10].
    - See below for full guidelines regarding use of graphics should they be necessary to support cohesion [11].
- When a new sentence does not relate directly to the prior sentence, start a new paragraph.
- Avoid bulleted lists [12,13] and write a series of complete, parallel sentences instead.

Sentence-Level Guidelines
- Limit each sentence to one key point [14] and one t-unit [37].
    - Target range for sentence length is 8-10 words [6].
    - Target range for number of words per t-unit is 6-8 [6].
- Only use complex sentences when required to support understanding of causal or other relational concepts [10,15,16,17,18].
- Repeat sentence types rather than vary them [1,2,19,20].
- Avoid negation entirely [17,18,21,22,23,24,25,26] including:
    - Analytic negation (e.g., not)
        - Original: This is not all possible symptoms.
        - Revision: There are other possible symptoms.
    - Academic down-turns (e.g., hardly, barely)
        - Original: He could barely breathe.
        - Revision: He had difficulty breathing.
    - Negative quantifiers (e.g., no, none, neither)

- Original: There are no other answers.
- Revision: This is the only answer.
  - Only use pronouns when the antecedents are located near the pronoun [18,27,28,29].
  - Use personal pronouns sparingly [3].
  - Avoid figurative language entirely [1,2,30].
    - Simile – compare 2 things with *like* or *as* (e.g., as cold as ice).
    - Metaphor – compare 2 dissimilar things (e.g., a marathon not a sprint).
    - Hyperbole – exaggeration to add emphasis (e.g., so sick you'll want to die).
    - Personification – giving human characteristics to non-living things (e.g., the sign says…).

Word-Level Guidelines
  - Ensure that at least 92% of the words are among the most frequently occurring words in written English [5,17,31].
  - Use words with the fewest possible syllables [2].
    - Find alternatives to medical and public health terms using Center for Disease Control's *Everyday Words for Public Health Communication* or National Center for Environmental Health/Agency for Toxic Substances and Disease Registry's *Environment Health Thesaurus*.
    - Use a standard online thesaurus or the tool built into Microsoft Word for non-medical terms.
  - Ensure that the majority of the words in the text are concrete rather than abstract [18,32,33,34,35].
    - When complex or technical words are required, use no more than one in a sentence.
    - If you must use a complex or technical word, define it in the text [18].
  - Avoid using different words that have the same meaning. Instead, use a single word repeatedly [2,6,16,36,37].
    - Target a type/token ratio (# of different words/total # of words) of less than 0.40.

Formatting and Layout Guidelines
  - Use a white background with black text [13, 38].
  - Present text in a single column [39,40,41,42,43,44,45].
    - Add a second column when using graphics and physically align graphics with related text [40,44,46].
    - Stack sentences with parallel sentence structures.
  - Use wide margins (≥ 1") [44].
  - Use left justification [13].
  - Start a new page when the subject changes [44].
  - Give each document a title that describes the topic of the document [44].
  - Use clearly stated headings and subheadings, avoid questions [44].
  - Include critical information in the main text and avoid the use of textboxes set apart from the main text [47].

- o Avoid bulleted and numbered lists [12, 13].
- o Make sure the end of the sentence is at the end of the line. Avoid splitting sentences across lines of text [12].
- o Avoid splitting words at the end of the line [44].

Graphics
- o Only use graphics (e.g., line drawings, photos, full-color images) when necessary to support understanding [38, 44,48,49].
- o When graphics are used:
    - o Select graphics (e.g., line drawings, photos, full-color images) that can be understood independently of text or explanation [44].
    - o Select graphics (e.g., line drawings, photos, full-color images) that directly support and match information in the text [38, 48,49].
    - o Caption each graphic (e.g., line drawings, photos, full-color images) with simplified explanatory text [44].
    - o Avoid graphics (e.g., line drawings, photos, full-color images) that communicate negation (e.g., graphics with a red X), consistent with the guidelines to avoid negation in the text [21,22,23,25,26,27,28,50].
    - o Avoid icons or other conceptual symbols or graphic images [51].
    - o Select graphics (e.g., line drawings, photos, full-color images) that include only essential information [48].
- o Graphics may appear in the branding on the header and/or footer.

Font and Text Effects
- o Present the main document in a single, san serif font (e.g., Arial, Avenir, Courier, Helvetica, Verdana) that is black and 18-24 point [12,13,38,52,53].
    - ▪ Note: Branding in the headers and footers may be a different size.

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