



Readability Levels of Health Education Materials in Communication Disorders

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Background

- Health literacy is one barrier responsible for the health gaps in minority populations. Agencies must address health literacy in order to decrease health disparities.
- Literacy research shows that people read three to five grades lower than educational attainment. 21 million cannot read. 50% read materials at the 5th grade level.
- A large portion of minorities is at risk because of their low literacy skills (less than 5th grade). They include:
 - individuals without appropriate educational levels,
 - learners of English as a second language,
 - persons with learning disabilities or acquired disabilities.
- Research has demonstrated that a large portion of consumer education material is above recommended readability levels. The Institute for Health Advancement summarized that materials:
 - usually appear at the 10th grade level or higher,
 - include too much information,
 - do not explain uncommon words, and
 - are accompanied by complex instructions.

Background

- In communication sciences, and disorders, consumer information is used for:
 - Prevention: language development milestones; dangers of noise exposure.
 - Counseling: nature of a disorder; evaluation and treatment options.
 - Treatment: treatment reading materials; carryover activities.
 - Research: recruitment of participants; research materials.
 - And others.

Research Goals and Method

- To gauge readability levels of consumer materials disseminated by the three most influential sources.
 - American Academy of Audiology (AAA)
 - American Speech-Language and Hearing Association (ASHA)
 - National Institutes on Deafness and other Communication Disorders (NIDCD)
- Determine if consumer materials are appropriate for low literacy clients (6th grade and below).
- Method
 - Fifty-one brochures from AAA (6), ASHA (26) and NIDCD (19) were evaluated.
 - Brochures were scanned and converted to .txt files.
 - To respect brochures' intent for succinctness, titles of brochures and sections, and bulleted items of brochures were followed by a period.
 - The software *Readability Calculations V 6.1* (Micropower & Light Co.) provided the readability measures.

Readability of Materials

- **Readability formulas**

- Techniques developed to provide an objective way to measure readability.
- Presented in the form of regression formulas that describe the relationship between two variables.
- They predict difficulty.

- **Other measures (not included in this study)**

- Format
- Pictures
- Spacing
- Reader cognitive style
- Others

Readability Assessment

- Various variables can be assessed to verify the appropriateness of materials: format, pictures, spacing, reader motivation, cognitive style and others.
- This study looked at complexity of syntax and vocabulary using Readability formulas.

Readability Formulas

Techniques that provide objective measurements, predict difficulty and describe the relationship between two variables

- **SMOG**

- Scores based on number of words with three syllables or more and number of sentences.
- Appropriate for 4th through college level materials.
- Tests for 100% comprehension, whereas other test for 50-75% comprehension.

$$\sqrt{\text{total complex words} \times \left(\frac{30}{\text{total sentences}}\right)} + 3$$

- **FOG**

- Scores based on the average number of words per sentences, and total number of difficult words (three syllables or more).

$$0.4 * \left(\left(\frac{\text{words}}{\text{sentence}} \right) + 100 \left(\frac{\text{complex words}}{\text{words}} \right) \right)$$

Readability Formulas

- **Flesch Reading Grade**

- Scores based on average sentence length and average syllables per word.
- Is the Dept. of Defense standard to write technical manuals.
- Based on research proving that we comprehend more and faster when words and sentences are shorter.
- Found in Word and WordPerfect software.

$$0.39 \left(\frac{\text{total words}}{\text{total sentences}} \right) + 11.8 \left(\frac{\text{total syllables}}{\text{total words}} \right) - 15.59$$

- **Flesch Reading Ease**

- Scores based on sentence length and number of syllables.
- Best meant for school text.
- Standard used by many US government agencies.
- Scores 0-100 (higher scores are easiest, below 30 very difficult, 65 is “plain English”).
- Most widely used outside education arena.
- Found in Word and WordPerfect software.

$$206.835 - 1.015 \left(\frac{\text{total words}}{\text{total sentences}} \right) - 84.6 \left(\frac{\text{total syllables}}{\text{total words}} \right)$$

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Score	Grade	Difficulty
90-100	4th	Very easy
80-89	5th	Easy
70-79	6th	Fairly Easy
60-69	7th to 8th	Standard
50-59	Some H.S.	Fairly Difficult
30-49	H.S. or some coll.	Difficult
0-20	College	Very Difficulty

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Results

Readability Score Averages, Modes and Ranges for each Source (N=51)

Source	n	Averages Reading Formulas*	Grade Ranges	Modes**
AAA	6	8.5	6.2 - 10.8	Grade 10(2)***; Grade 6 (2)
ASHA	26	8.4	5.5 - 10.4	Grade 9 (9)
NIDCD	19	9.6	5.0 - 12.8	Grade 11(5); Grade 9(5)
		8.8	5.0-12.8	Grade 9 (15)

*SMOG, FOG and Flesch Reading Grade

**Modes reported in whole grades.

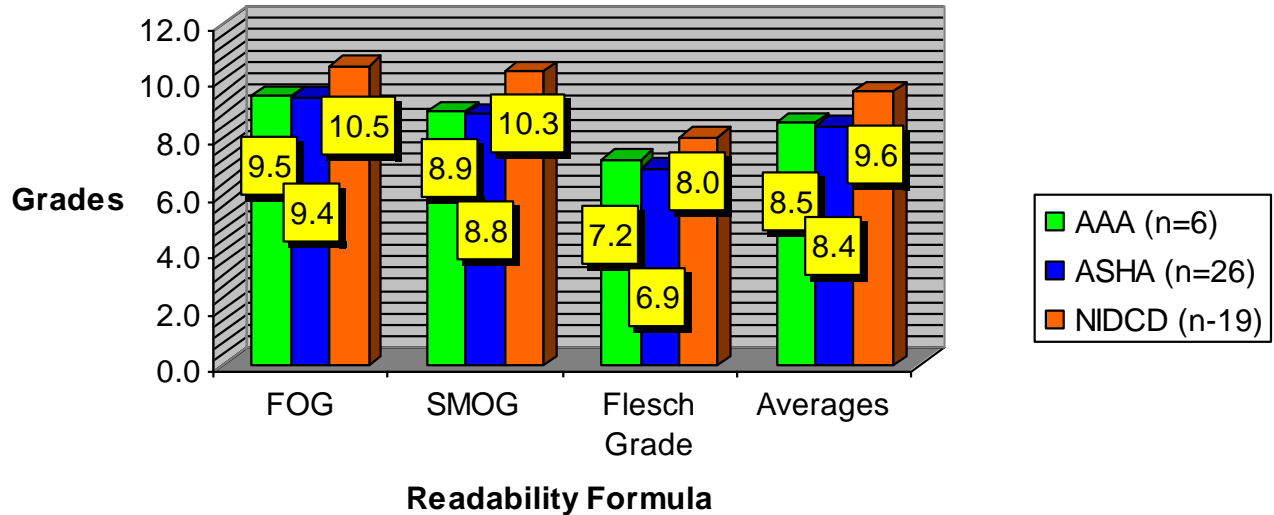
*** Number of occurrence presented in parenthesis.

- Reading level average for all brochures = Grade 8.8
- Most common reading level (Mode) = Grade 9
- Largest range of grades = NIDCD
- 25% of brochures (N=51) averaged grade levels of 6th grade and lower. Per source:
 - ASHA = 42.3% (11)
 - AAA = 16.6% (1 of 6)
 - NIDCD = 5.3% (1 of 19)

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**Averages for each Readability Formula
by Source (N=51)**



- As expected, Flesch Reading Ease Formula results appear lower than the other two formulas used.
- NIDCD brochures present the highest readability scores for all formulas.
- ASHA and AAA scores were comparable, with ASHA scoring slightly lower when comparing Flesch Reading Ease Scores.
- Lowest scores obtained were with the Flesch Reading Grade Formulas with brochures averaging 6.9.

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Flesch Reading Ease Averages, Modes and Range Scores for all Sources (N=51)

Source	n	Flesch Reading Ease	Grade Equivalent	Degree of Difficulty	Ranges	Modes*
AAA	6	55	Some HS	Fairly Difficult	32 - 72	Could not be obtained.
ASHA	26	56	Some HS	Fairly Difficult	35 - 77	HS and Some College/Fairly Difficult (9)**
NIDCD	19	57	Some HS	Fairly Difficult	32 - 82	Some HS/Fairly Difficult (6); HS and Some College/Difficult (6)

* Number of occurrence presented in parenthesis.

- Overall average of scores resulted in grade equivalencies of “Some High School/Fairly Difficult.”
- Mode Ranges for all sources appear comparable, with NIDCD containing brochures with a lower level of difficulty.
- All Sources included some brochures at the 6th grade level/Fairly Easy).
- AAA and ASHA most difficult brochures were scored at the “HS and some college/Fairly Difficult).
- NIDCD brochures included brochures that were at the “Some College/Difficult” level.

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Conclusions

- Readability results for this project probed formulas that rely on the use of sentences and words in content information and did not consider other factors which also contribute to readability of materials.
- The use of different formulas will result in different grade scores, nevertheless, they all point to reading levels that are higher than preferred.
- A large majority of brochures being used for consumer education by the three sources appear to be too difficult (8th and 9th grades and some High School) to address the needs of low literate populations. These results run congruent to other research gauging readability of consumer education material in the health arena.
- Overall assessment of ASHA brochures, when compared to other sources, proved favorable for the amount of brochures scoring at the 6th grade level or less.

Recommendations

- When using these brochures:

- Consider consumer level of literacy.
- Accompany brochures with other information to facilitate understanding (pictures).
- Accompany brochures with verbal explanations.

- When producing materials:

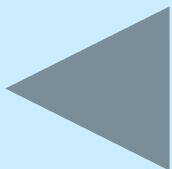
- Sentences should average 15-20 words per sentences, few clauses.
- Use concrete everyday words (ex: “start” instead of “initiate”), few syllables.
- Writing styles (cohesiveness, active voice, etc.).
- Document design – few pages, illustrations, lots of white spaces.
- Format – bullets, bold/italic titles, 12+ point,
- Offer examples.

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Future website: www.myhealthstories.com



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