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Are Drivers' Manuals Understandable?

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Are Drivers' Manuals Understandable?

In 1984, researchers determined that the readability of state drivers' manuals exceeded the average literacy levels in the United States. Because text complexity threatened the ability of license applicants and practicing drivers to understand the information presented in the manuals, a potential safety risk was indicated. This study analyzes recent editions of the manuals using readability formulas and formal text presentation ratings. It was found that the average difficulty of the drivers' manuals was reduced by more than one grade level and that the 1994 manuals are clearly superior to their earlier versions, but that, in the interest of highway safety, improvement should still be sought.

by Norman A. Stahl, William A. Henk and Ulinda Eilers

Drivers' manuals are instructional and informational documents that are issued by departments of transportation as an integral component of each state's total driver safety effort. Typically, driver license applicants read and study these manuals diligently in preparation for their conceptual and applied driving tests. For licensed drivers, the manuals represent an important and often singular reference for traffic regulations and driving safety. In both instances, the documents provide a foundation of knowledge that could impact a driver's preparedness to operate a motor vehicle appropriately.

A decade ago, literacy researchers reported in *Transportation Quarterly* that the majority of state drivers' manuals were written at levels of difficulty that exceeded the reading competence of the general population.[1] Using readability formulas (mathematical indices of text

difficulty), these researchers found that the average complexity of the drivers' manuals used in the United States measured at the 10th grade level. This finding took on added significance insofar as the average reading level for U.S. citizens equals roughly eighth or ninth grade at best.[2] In other words, the complexity of the drivers' manuals jeopardized the likelihood that both beginning and experienced drivers would embrace the rules of the road well enough to master the demands of the driving environment.

Recognizing the importance of the drivers' manuals being easily understood, Henk, Stahl, and King (1984) outlined several specific suggestions for enhancing these documents. The recommendations included reducing the manuals' difficulty levels through better word choice and sentence construction, and for improving other aspects of the documents that could not be measured by the formulas, but that influenced com-

prehensibility nonetheless (i.e., visual aids, page formats, legibility factors, study aids, handling, and durability).

The intent of the present study was to determine whether drivers' manuals have improved significantly over the past ten years. To do so, we analyzed the latest versions of the manuals for their readability, quantified some of the formerly elusive text presentation factors (i.e., organization, consistency, cohesion, explication, concept density, metadiscourse, and instructional devices) using a text evaluation instrument, and revisited other aspects of the manuals that fell outside the capability of the instrument per se. In effect, we were looking to see if states had been responsive to the 1984 data as evidenced by more considerate language use and better delivered text presentations in the more recent drivers' manuals.

Because the reading and studying of drivers' manuals usually represents the only intensive exposure most drivers have to traffic safety and driving rules, the original learning of concepts by license applicants must be thorough and enduring. Any failure of the manual to communicate key concepts or of the applicant to comprehend them could result in serious or tragic consequences later. With this perspective in mind, the present study serves to recognize those states whose drivers' manuals have been carefully and thoughtfully crafted and to signal other states of the need for additional enhancements.

The Basics of Readability

Readability is defined as the relative ease or difficulty a reader experiences in attempting to understand the concepts presented by an author in written text. Since a host of reader, text, and contextual variables impact upon the readabil-

ity of written material, measurements of any kind represent estimates rather than precise indicators.[3] Even so, literacy researchers have often employed tools known as readability formulas to estimate the approximate difficulty level of texts. In general, readability formulas are considered to be sufficiently accurate and reliable to be used in business and industry, government, the military, and the legal system with regard to safety, product usage and liability, and contract issues.[4]

Readability formulas use two criteria, word difficulty and grammatical/ semantic complexity, to calculate an assumed level of reading ease.[5] In this context, word difficulty is presumed to be related to word familiarity; that is, unfamiliar words tend to make text more difficult to comprehend. Word difficulty is usually estimated either by noting some aspect of word length or by comparing the text's contents against high frequency word lists. The principle in the first instance is that shorter words (e.g., less letters or syllables) tend to be familiar. In the second instance, words that occur frequently in the language are likely to be known, and therefore, more easily understood.

Grammatical/Semantic complexity is presumed to be related to the average length of sentences that make up the text. As sentences increase in length, their corresponding syntactic structures and concept density are believed to place a greater cognitive burden on the reader. In turn, this increased cognitive load makes the text less readable.

It is important to note that the assumptions underlying both word length and sentence length as readability criteria have their limitations. Some short words are unfamiliar and problematic, and some short sentences are difficult to comprehend. Likewise, long words can

be well known, and lengthy sentences can be easily understood. However, when applied to samples of continuous text, the two criteria hold up well enough to allow for judgments of text difficulty to be made with more than a moderate degree of confidence.[6]

It is also important to remember that a high grade level rating for a text is associated with lower readability. By contrast, the lower the readability grade level, the easier the text will be to read. In this sense, the term "readability" is more closely akin to reading ease than it is to reading difficulty.

Procedure

Readability Analyses. Beginning in the spring of 1992 and continuing through the spring of 1993, requests were made to each of the 50 states and to Puerto Rico for copies of their most recent drivers' manuals. As in the Henk, Stahl, and King (1984) study, the Fry and Flesch readability formulas were used to analyze the 51 drivers' manuals.[7] These formulas both require that the average number of syllables and sentences per 100 words be computed across sample passages derived from the manuals. The reporting of the each formula's results is somewhat different, however. The Fry formula yields a single grade level, accurate to within one grade in either direction. The Flesch formula, on the other hand, yields range scores above seventh grade, and further labels readability levels as being *easy, fairly easy, moderate, fairly difficult, difficult, or very difficult*. In this study, numerical calculations based on the Flesch data were converted to range midpoints (i.e., 8.5, 11, and 14.5) for grades 8-9, 10-12, and 13-16, respectively, for all analyses.

To increase the validity and reliability of the readability measurements, the number of sample passages analyzed per manual was doubled. Whereas the earlier study used four passages that dealt with common traffic code themes (i.e., motorcycle safety, the use of seat belts, driving under the influence of alcohol, and acquiring a learner's permit), the present analysis included passages focusing on these same themes as well as samples drawn at quarterly intervals throughout each manual. That is, additional passages were selected at one-fourth of the way through the manual, one-half of the way, three-fourths of the way, and at the end. The interval samples were identified through estimating. Like the passages representing the four common themes, a requirement of the quarterly passages was that they did not depend on pictorial illustration of any kind because readability formulas cannot tap this aspect of text difficulty. Interval passages referring to illustrations were abandoned in favor of the next appropriate sample that occurred.

Text Presentation Analyses. To conduct the analyses of text presentation, we used a modified version of the *Singer Friendly Text Evaluation Scale (SFTES)*.[8] Five items were dropped from the original instrument because they dealt specifically with textbooks. In addition, two original items were revised slightly, and six items were added from another scale.[9] The modifications allowed the instrument to assess the unique character of the drivers' manual format.

The final version contained 35 items and seven categories: Organization (ORG), Discourse Consistency (DIS), Cohesiveness (COH), Explication (EXP), Conceptual Density (CON), Metadiscourse (MET), and Instructional Devices (INS). The Organization category dealt with the introduction, sequence of presentation, paragraph structure, author cueing, and use

of signal words, while Discourse Consistency tapped writing style as it related to text patterning. Under the category of Cohesiveness, the connectedness of ideas was examined. Explication was a broad category that looked at provisions for defining key terms and technical vocabulary, activating background knowledge, using examples and active sentence structures, and general clarity of explanations. The Conceptual Density category focused on concept integration, vocabulary load, and accuracy whereas the Metadiscourse items centered on the author's providing directions for learning, purpose setting, and highlighting of relationships between current text and prior text information and reader knowledge. Finally, the Instructional Devices section included items directed at the table of contents, glossary, index, adjunct aids, summaries, study questions, headings, application of knowledge, and legibility.[10]

The number of items per category ranged from one each for Discourse Consistency and Cohesiveness, to three each for Conceptual Density and Metadiscourse, seven for Organization, and ten each for Explication and Instructional Devices. The small number of items for certain categories did not constitute a reliability issue because subscale scores were not intended to be freestanding. Instead, these scores could be used for diagnostic purposes with individual manuals. Total scores, on the other hand, allow for more reliable and meaningful comparisons to be made between the manuals. The Alpha reliability of the modified SFTES used in this study measured .88, a most acceptable coefficient for an instrument of this kind.

Following an extended orientation session, two expert evaluators independently rated each of the drivers' manuals using the modified instrument. Each item was positively stated and appeared in a Likert format with choices that included Strongly Disagree, Disagree, Undecided, Agree, or Strongly Agree. These choices corresponded to respective ratings of 1 through 5, resulting in a maximum possible score of 175 (35 items X 5). Inter-rater reliability initially measured a respectable .82; however, in cases where scores deviated appreciably, discussion was used to reduce the disparity. Inter-rater agreement increased to .92 following this dialogue.

Results

Readability Findings. Table 1 presents the 1984 and 1994 readability data for drivers' manuals by state using the Fry and Flesch formulas. Since both formulas rely on syllable counts and sentence lengths as determining criteria, it was not surprising that they correlated at the .0001 level ($r=.94$). In fact, the formulas placed 45 states within the same readability range. For the six instances of disagreement, the Flesch formula rated the manuals as being more difficult.

An examination of the first two columns, which compare the two Fry data sets, suggests a general trend towards reduced difficulty for the newer manuals. A similar pattern emerges when the 1984 and 1994 Flesch scores in columns three and four are compared. In fact, within the last decade, difficulty levels dropped from 10.3 to 9.0 for the Fry formula and from 10.66 to 9.43 for the Flesch assessments. Interestingly, the respective variation in 1984 Fry and Flesch scores (SDs=1.86 and 2.59) decreased in the 1994 data set (SDs=1.72 and 2.19) as a function of grade level reduction.

Of the 51 assessments, 34 of the states (67%) achieved a better Fry read

TABLE 1: READABILITY ESTIMATES OF DRIVERS' MANUALS

State	Fry(1984)	Fry(1994)	Flesch (1984)	Flesch(1994)	Difficulty Level
Alabama	12	10	10-12	10-12	Fairly Difficult
Alaska	13	11	10-12	10-12	Fairly Difficult
Arizona	9	9	8-9	8-9	Moderate
Arkansas	11	12	10-12	13-16	Difficult
California	9	7	8-9	7	Fairly Easy
Colorado	11	9	10-12	8-9	Moderate
Connecticut	6	7	6	7	Fairly Easy
Delaware	10	8	10-12	8-9	Moderate
Florida	10	8	8-9	8-9	Moderate
Georgia	7	10	7	10-12	Fairly Difficult
Hawaii	12	10	13-16	10-12	Fairly Difficult
Idaho	11	7	10-12	7	Fairly Easy
Illinois	9	7	8-9	7	Fairly Easy
Indiana	10	11	10-12	10-12	Fairly Difficult
Iowa	10	8	10-12	8-9	Moderate
Kansas	8	10	8-9	10-12	Fairly Difficult
Kentucky	11	8	10-12	8-9	Moderate
Louisiana	7	9	7	8-9	Moderate
Maine	10	11	8-9	10-12	Fairly Difficult
Maryland	12	13	13-16	13-16	Difficult
Massachusetts	12	12	13-16	13-16	Difficult
Michigan	8	10	8-9	10-12	Fairly Difficult
Minnesota	11	8	10-12	8-9	Moderate
Mississippi	12	9	13-16	8-9	Moderate
Missouri	12	7	13-16	7	Fairly Easy
Montana	11	9	10-12	8-9	Moderate
Nebraska	15	10	17+	10-12	Fairly Difficult
Nevada	11	7	10-12	7	Fairly Easy
New Hampshire	9	7	10-12	7	Fairly Easy
New Jersey	7	7	7	8-9	Moderate
New Mexico	10	11	10-12	10-12	Fairly Difficult
New York	12	10	13-16	10-12	Fairly Difficult
North Carolina	9	9	8-9	8-9	Moderate
North Dakota	10	9	8-9	8-9	Moderate
Ohio	14	14	13-16	13-16	Difficult
Oklahoma	13	12	13-16	13-16	Difficult
Oregon	9	9	8-9	8-9	Moderate
Pennsylvania	10	7	8-9	7	Fairly Easy
Rhode Island	10	9	10-12	10-12	Fairly Difficult
South Carolina	9	8	7	8-9	Moderate
South Dakota	10	9	10-12	8-9	Moderate
Tennessee	11	10	10-12	10-12	Fairly Difficult
Texas	10	8	8-9	8-9	Moderate
Utah	9	8	8-9	8-9	Moderate
Vermont	13	7	13-16	7	Fairly Easy
Virginia	8	9	8-9	8-9	Moderate
Washington	13	9	13-16	8-9	Moderate
West Virginia	10	9	10-12	8-9	Moderate
Wisconsin	11	7	10-12	7	Fairly Easy
Wyoming	10	9	10-12	8-9	Moderate
Puerto Rico	9	7	8-9	8-9	Moderate

ability rating than they had in 1984.[11] On average, these states witnessed a reduction of 2.38 grade levels. Fully 23 states (45%) moved two or more grade levels in a desirable direction. Seven states made especially impressive improvements: Idaho (-4 grade levels), Missouri (-5), Nebraska (-5), Nevada (-4), Vermont (-6), Washington (-4), and Wisconsin (-4). Overall, readability levels of ninth grade or lower were achieved by two thirds of the states (34) in 1994 compared to less than one third (16) in 1984.

At the same time, 11 states (22%) evidenced increased Fry difficulty levels in 1994. Across these states an average increase of 1.45 grade levels was observed. Fortunately, only four states exhibited increases of two or more grade levels, and none of these manuals exceeded the 10th grade level. The readability levels of six states (12%) remained the same in 1994.

In Table 2, data yielded by the Flesch formula demonstrate further the noteworthy changes that have occurred in the readability of the drivers' manuals. In 1984, nearly 60% of the manuals measured in the fairly difficult to very difficult range. By contrast, only 35% of the manuals fell into this less acceptable range in 1994. To a large extent, this improvement reflects the fact that seven manuals rated as fairly difficult in 1984 moved into the moderate range for 1994 and four manuals moved from a fairly difficult to fairly easy classification. In addition, while only 41% of the manuals were written at the ninth grade level or below in 1984 according to the Flesch formula, this amount had increased to 65% by 1994.

Text Presentation Findings. On the *Singer Friendly Text Evaluation Scale,* the mean for the 51 manuals measured 115.1 out of a possible maximum score of 175. This mean indicates that, on average, the evaluators tended to rate each of the 35 items at 3.28, slightly beyond the Undecided response. The standard deviation for the SFTES scores equalled 14.83.

Table 3 presents the evaluators' averaged ratings for the total scale and for each category. The table indicates that four of the drivers' manuals achieved superior ratings: Connecticut, Iowa, New Jersey, and Wisconsin. These manuals approached or exceeded a score of 140, the equivalent of 1 1/2 standard deviations above the mean. Arizona, Hawaii, Idaho, Illinois, New York, Pennsylvania, South Carolina, Vermont, and Virginia also received scores more than one standard deviation above the mean. By contrast, nine of the manuals fell below 100, a score representing one

TABLE 2: NUMBER (AND PERCENTAGE) OF STATE DRIVERS' MANUALS ATTAINING VARIOUS FLESCH READABILITY LEVELS

Readability Range	Grade(s)	Number of States 1984	Number of States 1994
Easy	6	1 (2%)	0 (0%)
Fairly Easy	7	3 (6%)	10 (20%)
Moderate	8-9	17 (13%)	23 (45%)
Fairly Difficult	10-12	19 (37%)	13 (25%)
Difficult	13-16	8 (16%)	5 (10%)
Very Difficult	17+	3 (6%)	0 (0%)

TABLE 3: TOTAL AND SCALE RATINGS FOR TEXT PRESENTATION

	Total	ORG.	DIS.	COH.	EXP.	CON.	MET.	INS.
Alabama	87.5	2.5	3.5	3.5	1.9	2.8	3.8	2.8
Alaska	106.5	2.6	4.0	3.5	3.0	4.3	3.2	2.9
Arizona	128.5	3.9	4.5	4.5	3.8	4.3	4.0	3.1
Arkansas	90.0	2.4	3.0	3.5	3.3	3.2	2.0	1.8
California	118.5	3.0	4.0	4.0	3.6	4.2	3.5	3.1
Colorado	117.5	3.4	4.0	4.5	4.1	4.2	3.5	2.8
Connecticut	139.5	4.6	4.5	4.5	3.0	4.3	4.0	3.5
Delaware	122.5	3.1	3.5	3.0	3.7	4.5	3.5	3.2
Florida	115.5	2.7	2.5	3.0	3.5	3.7	1.7	3.8
Georgia	111.0	3.4	4.0	4.0	3.5	3.7	3.2	2.6
Hawaii	126.0	3.0	4.0	4.5	3.7	4.3	3.3	3.7
Idaho	131.0	3.3	4.5	4.5	3.8	4.5	3.3	3.8
Illinois	126.0	3.9	4.0	3.0	3.5	4.0	3.5	3.5
Indiana	92.5	2.1	3.0	4.0	2.7	3.7	2.5	2.4
Iowa	144.5	4.1	5.0	5.0	4.0	4.5	3.3	4.3
Kansas	99.5	2.6	3.0	3.5	2.7	4.2	2.5	2.8
Kentucky	120.5	3.4	4.0	3.5	3.8	4.5	3.0	2.9
Louisiana	103.0	2.9	4.0	3.0	2.9	3.8	2.7	2.8
Maine	91.5	2.3	4.0	4.0	2.8	3.5	1.5	2.5
Maryland	96.0	2.5	4.0	3.0	2.6	4.0	2.5	2.7
Massachusetts	107.5	2.6	4.0	4.0	2.8	3.3	2.5	3.6
Michigan	116.5	3.9	4.5	4.5	3.2	4.3	3.5	2.9
Minnesota	120.0	3.9	4.0	4.0	2.8	3.7	3.7	3.4
Mississippi	140.5	4.3	4.5	4.5	3.7	4.7	4.2	3.9
Missouri	108.5	2.6	4.0	4.5	3.5	4.2	2.7	2.7
Montana	102.0	2.8	4.0	3.5	2.5	4.3	3.3	2.6
Nebraska	99.5	2.2	3.5	3.5	3.2	4.0	2.2	2.7
Nevada	121.0	3.5	4.5	4.0	3.8	4.5	3.0	2.8
New Hampshire	114.0	2.9	4.0	4.5	3.3	3.8	3.0	3.2
New Jersey	141.5	4.2	4.5	4.5	4.0	4.5	3.8	3.9
New Mexico	98.0	2.4	2.0	3.0	3.2	4.0	2.5	2.6
New York	129.0	3.1	4.5	4.5	4.2	4.5	3.3	3.3
North Carolina	119.0	2.8	4.5	4.0	3.8	4.5	2.7	3.2
North Dakota	104.0	2.9	4.0	3.5	3.1	4.0	2.0	2.9
Ohio	100.5	2.9	4.0	4.5	3.0	3.7	2.3	2.4
Oklahoma	107.5	2.7	4.0	3.0	3.5	4.2	2.0	2.8
Oregon	117.0	3.0	4.5	4.5	3.2	4.5	2.7	3.0
Pennsylvania	131.0	3.6	4.5	4.5	3.9	4.5	3.7	3.3
Rhode Island	92.5	2.2	3.0	3.0	3.2	3.8	1.7	2.3
South Carolina	126.0	3.1	4.5	4.5	3.7	4.7	3.2	3.5
South Dakota	120.0	2.7	4.0	4.0	3.9	4.3	3.3	3.2
Tennessee	115.5	2.2	4.5	4.0	3.7	4.5	2.3	3.3
Texas	120.0	2.9	4.5	4.0	3.9	4.3	2.3	3.2
Utah	116.0	2.7	4.5	4.5	3.7	4.3	2.7	3.1
Vermont	124.0	2.9	4.5	4.5	3.9	4.7	3.5	3.5
Virginia	132.5	3.3	4.5	4.5	3.9	4.5	3.7	3.7
Washington	119.5	3.1	4.5	4.5	2.9	4.0	3.3	3.7
West Virginia	108.5	3.0	4.0	4.5	3.0	4.2	2.2	3.1
Wisconsin	142.0	4.0	4.5	4.5	4.1	4.5	4.2	3.9
Wyoming	117.5	2.9	4.5	4.5	3.6	4.2	2.5	3.3
Puerto Rico	92.0	2.4	3.0	3.0	2.6	3.3	2.0	2.8

full standard deviation below the mean. Six of these manuals were more than 1 1/2 standard deviations below the mean: Alabama, Arkansas, Indiana, Maine, Puerto Rico, and Rhode Island. Interestingly, the Fry readabilities for Puerto Rico (7th grade) and Rhode Island (9th) were quite acceptable, whereas Alabama, Arkansas, Indiana, and Maine measured from 10th to 12th grade.

An informal item analysis of the average scores for the seven categories reported in Table 3 reveals some general patterns. Most prominently, the Instructional Devices category did not fare very well. The raters identified glossaries, summaries, study questions, and indexes as being either inferior or absent altogether. Under the Organization category, they also cited introductions as failing to provide adequate information on the sequence of topics and how to learn from the text. Finally, with regard to the Explication category, the raters detected weaknesses of the manuals in defining key words at the beginnings or endings of chapters.

It is interesting to note that the Pearson Product-Moment correlation between the Fry readability formula and *Singer Friendly Text Evaluation Scale* scores was -.57 (p < .0001). Thus, as might be predicted, increases in the SFTES scores (indicating more friendly texts) were associated with decreases in the Fry readability grade levels (indicating easier reading). The correlation also indicates that although the SFTES and the Fry formula were significantly related, they only accounted for 33% shared variance. This figure suggests that these tools measured somewhat different aspects of text comprehensibility.

Finally, as a follow-up to the SFTES, we revisited other aspects of the manu-

als that were identified as concerns in 1984. For instance, page formats had been characterized by small type size, inadequate margins and spacing between lines, the overuse of multiple columns, and too much information per page, all factors that contribute to reading fatigue. In 1994, however, type size was acceptable in 90% of the manuals, line spacing had been increased generally, multiple column formats were used judiciously, and the amount of information per page had been reduced. By contrast, left and righthand margins were still not ample enough on the whole, with the majority falling at one half inch or less. Generally, the newer manuals were easier to handle and, with the exception of one manual that was set up in a newspaper format, they were sufficiently durable. The 1994 manuals also made better use of graphic conventions (e.g., boldface, centering, enumeration, underlining, headings, etc.), their paper quality tended to be more desirable overall in terms of glare and general appearance, and only a handful failed to make use of colored road signs and meaningful captioning.

Discussion

In general, the 1994 readability analyses suggest that state drivers' manuals have improved considerably over the past decade. Both the Fry and Flesch assessments indicated grade level reductions of over one full year. Whereas the 1984 analyses revealed an average readability in the 10th grade range (which is considered fairly difficult), the 1994 data show an average readability of 9th grade. Moreover, two thirds of the 1994 manuals fall into this moderate readability range. Given that the average reading levels in the nation have remained stable, hovering near 9th grade

level, these results are certainly encouraging.

This overall trend toward improved readability is most welcome.

It was particularly commendable that nearly two thirds of the manuals were more readable than they had been in 1984. Perhaps even more impressive was the fact that almost half of the manuals achieved a two grade level reduction and that seven states realized a reduction of four grades or more.

Despite the promise of the 1994 readability results, room for improvement clearly exists. For instance, slightly more than one third of the drivers' manuals still fall in the fairly difficult and difficult ranges. In addition, better than one fifth of the manuals actually increased in difficulty in the ten year period. While the increases tended to be modest, they still limit the possibility that both novice and licensed drivers will fully understand crucial concepts presented in the manuals.

The evaluators' ratings of the drivers' manuals on the *Singer Friendly Text Evaluation Scale* must also temper our optimism somewhat. Generally, the evaluators did not rate the manuals very highly. On average, their ratings indicated that they were undecided about the overall quality of the manuals, and that one tenth of the documents were simply inferior. Their ratings also signaled specific limitations in the introductions, vocabulary provisions, summaries, study questions, and indexes of the manuals. Of course, it would have been desirable to have SFTES comparison data for 1984, but the original instrument had not yet been developed.

Certain manuals did manage to demonstrate both acceptable levels of readability and solid text presentation characteristics. New Jersey and Wisconsin stand out as the best of the lot on these measures. These states couple 7th grade readability levels with superb friendly text scores. Idaho, Pennsylvania, and Vermont also exhibit 7th grade readabilities, and their friendly text scores are quite desirable as well. Iowa and Mississippi showcase exceptional friendly text scores and readability levels that measure at 8th and 9th grade, respectively. Likewise, other states such as Arizona, Delaware, Illinois, Kentucky, Minnesota, Nevada, South Carolina, and Washington combine readable text language with commendable text presentation attributes.

Our recommendation is that developers of the drivers' manuals continue striving to achieve more readable texts and better presentations.[12] In this regard, an author's word choice should be governed by familiarity and expected reading ease. Similarly, the construction of sentences needs to be kept simple, and meanings should be made direct and clear. Special attention needs to be given to a rather wide array of text presentation attributes. For instance, introductions should set purposes for learning and indicate the sequence of topics. Key vocabulary should be defined either at the beginning or end of chapters, and functional summaries, focused study questions, and exhaustive indexes should be included. Developers would also do well to look to the South Carolina manual as a model of excellence with respect to overall physical appearance, formatting, and construction.

Provisions to make the drivers' manuals more user friendly and readable figure to be well worth the effort. As drivers gain a richer and more complete grasp of the manuals' content, a foundation of knowledge is laid that can effectively serve for a lifetime. The end result could very well be increased highway safety. In this sense, drivers' manuals

that truly facilitate the learning and retention of key concepts represent a significant dimension of each state's motor vehicle safety effort.

Endnotes

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8. Harry Singer, "Friendly Text: Description and Criteria."In Ernest K. Dishner, Thomas W. Bean, John E. Readence, and David W. Moore (Eds.), *Reading in the Content Areas*, 2nd ed. (Dubuque, IA: Kendall/Hunt, 1986, pp. 112-121).

9. Lucille Jevitz, and Donald W. Meints, "Be a Better Book Buyer: Guidelines for Textbook Evaluation," *Journal of Reading 22*, No. 8 (1979): 734-738.

10. A copy of the modified instrument can be obtained by writing to the authors.

11. It is important to note that comparisons between 1984 and 1994 data could be related to measurement error at either or both data points. Since more samples were drawn in 1994, measurement error is less likely, although readability formulas are, in general, only accurate to within plus or minus one grade level.

12. For additional guidance on reducing text difficulty, see Henk, Stahl, and King (1984), pp. 514-516.

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