The Effect of Line Length and Passage Type on Reading Speed, Comprehension, and User Satisfaction

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1. Introduction

Research findings on the effects of line length on reading speed have not been consistent. Many online designers use the recommended line length for printed material, approximately 52 characters per line (cpl) [1] when designing online reading material. However, researchers have found 55 cpl [2], 75-100 cpl [3, 4], and 100 cpl [5] to result in faster online reading speeds.

The effect of line length on comprehension has also varied. While comprehension has been assessed differently across studies, a set of questions intended to determine if the reader has retained the information from the passage is commonly used. According to McKnight, there is no consensus about how comprehension should be assessed [6]. Recently, Dyson and Haselgrove [2] used a more comprehensive set of questions that required the reader to use higher order thinking, to remember order of items (structure), to recall main ideas, to recall incidental facts from the passage, and to indicate if a line was in the passage or not. Using this refined tool for measuring comprehension, they found that 55 cpl facilitated better overall comprehension.

In an attempt to further investigate the effects of line length on online readability, this study investigated the effects of four different line lengths on reading speed and comprehension. The effects of the varying line lengths (35, 55, 75, and 95 cpl) were investigated across two types of passages: short, online news stories and longer, narrative passages.

2. Experiment, Results, Discussion, and Significance

The dependent variables of interest were reading speed, comprehension, satisfaction, and user preference. Reading speed was measured in words per minute. Comprehension was assessed with a set of multiple choice and true/false questions covering a variety of material from the passages which are described in detail in the Materials section. Satisfaction was measured using a Reading Satisfaction Questionnaire consisting of 11 questions. Users indicated their preferred line length at the completion of the experiment during the Post-Experiment Evaluation.

Passages with approximately 2500 words were selected for the four narrative sources such as East of the Web (www.short-stories.co.uk). The average passage length for the narrative passages condition was 2404.5 words. News articles were defined as having between 300 and 450 words. Eight news articles averaging 367.88 words per article were chosen from MSN® and Yahoo® news.

ReadingSpeed

A main effect of line length was found with the 95 cpl condition resulting in significantly faster reading speed. A main effect of passage type on reading speed was found with the longer, narrative passages being read faster than the shorter, news passages.

Comprehension

No main effects for line length or passage type on comprehension were found. However, as shown in Figure 1, a significant interaction of line length and passage type was found. Post hoc t-tests revealed a significant difference between scores on 35 cpl and 75 cpl in the long, narrative condition; 35 cpl narrative was also significantly different than 35 cpl, 55 cpl, and 95 cpl in the news condition. When evaluating reading efficiency (calculated by multiplying the words per minute by the percentage correct on overall comprehension), there was no effect of line length. An effect of passage type was found with the narrative passages resulting in higher reading efficiency.

Satisfaction

A main effect of passage type was found for two satisfaction questions indicating that users felt more confident in their comprehension and ability to concentrate on the narrative passages.

User Preference

The trend revealed in Figure 2 shows that participants often rated conditions 35 cpl and 95 cpl as either their most or least favorite choice.
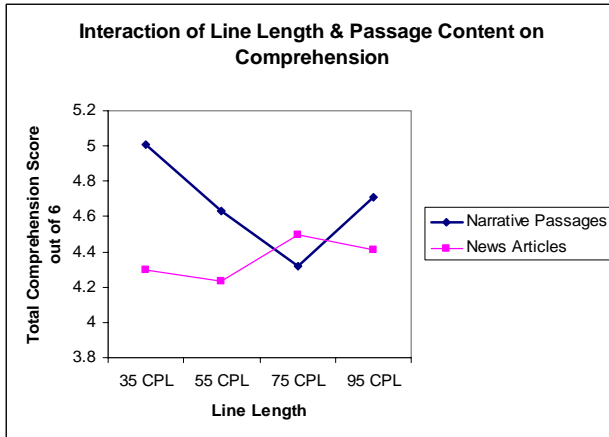
Interaction of Line Length & Passage Content on Comprehension

Figure 1. The interaction of line length and passage type on comprehension.
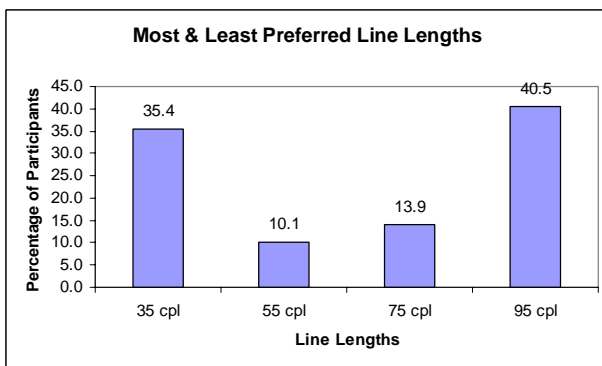
Most & Least Preferred Line Lengths

Figure 2. Percentage of participants choosing line lengths as their least or most favorite

3. Conclusions

Reading rates were fastest at 95 cpl. Participants read the 95 cpl passages faster in both the narrative and news conditions. Across both passage types (narrative and news) reading speed increased as line length increased. There was no interaction of line length and passage type indicating the effects were similar across all line lengths and both passage types. There does not seem to be one line length that is suitable for one type of passage; rather, a longer line length has speed advantages regardless of passage type. When evaluating the effect of passage type on reading rates, the narrative passages were read significantly faster than the news articles. in this experiment the 35 cpl condition resulted in the highest comprehension score for the narrative passages. In the news article condition, the best comprehension score was at 75 cpl. Preference was not significantly different in this study which may be attributed to the participants choosing 35 cpl and 95 cpl as their least or most favorite almost equally. These findings make recommendations challenging due to the fact that users indicated preferences for the extreme conditions while reading one extreme faster (95 cpl) and comprehending better (in narrative passages) at the other extreme (35 cpl).

4. Acknowledgements

5. References

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