The Effects of White Space and Line Length on Reading Speed and Engagement

1. Introduction

White space (including line, paragraph, and margin spacing) and line length are fundamental elements of text layout that influence how efficiently and comfortably people read digital content. Research shows that **moderate increases in white space—especially line and paragraph spacing—can improve reading speed, comfort, and subjective engagement**, but excessive spacing may hinder performance by increasing scrolling or fragmenting the text (Huang et al., 2018; Chaparro et al., 2004; Kwok et al., 2023; Chiu & Drieghe, 2023; Chan & Lee, 2005; Zhou et al., 2023; Scaltritti et al., 2019; Ling & Schaik, 2007). Similarly, **optimal line lengths (typically 50–75 characters per line)** facilitate faster reading and better comprehension, while lines that are too short or too long can slow readers down and reduce engagement (Dyson, 2004; Schneps et al., 2013; Duchnicky & Kolers, 1983; Scaltritti et al., 2019). The effects of these variables can differ across populations, with individuals with dyslexia or visual impairments often benefiting more from increased spacing and shorter lines (Joo et al., 2018; Schneps et al., 2013; Blackmore-Wright et al., 2013; Perea et al., 2012; Galliussi et al., 2020; Rello & Baeza-Yates, 2015; Zorzi et al., 2012; Sjoblom et al., 2016). However, the relationship is nuanced, and the best configuration depends on the reading context, device, and user needs.

2. Methods

A comprehensive search was conducted across over 170 million research papers in Consensus, including Semantic Scholar, PubMed, and other databases. The search targeted studies on white space, line length, reading speed, and engagement, with a focus on digital and screen-based reading. Out of 1,032 identified papers, 737 were screened, 468 met eligibility criteria, and the 50 most relevant papers were included in this review.

Search Strategy

Identification N = 1032 → Screening N = 737 → Eligibility N = 468 → Included N = 50

Identification
- Identified 1016 papers that matched 20 Consensus searches — + 1016 identified
- Identified 16 papers from citation graph exploration — + 16 identified

Screening
- Removed papers with missing abstracts
- Removed duplicates — − 295 removed

Eligibility
- Removed papers with low semantic relevance to each search — − 269 removed

Included
- Selected the top 50 highest quality papers after final ranking — − 418 removed

FIGURE 1 Flow diagram of search and selection process.

Twenty unique search strategies were used, focusing on white space, line length, digital reading, and engagement.

3. Results

3.1 White Space: Line, Paragraph, and Margin Spacing

- **Line and paragraph spacing:** Moderate increases in line and paragraph spacing generally improve reading speed, comfort, and subjective ratings of ease and preference (Huang et al., 2018; Chaparro et al., 2004; Kwok et al., 2023; Chiu & Drieghe, 2023; Chan & Lee, 2005; Zhou et al., 2023; Scaltritti et al., 2019; Ling & Schaik, 2007). For example, chunking text into discriminable paragraphs with extra white space reduces reading time and increases comfort (Huang et al., 2018). However, excessive white space can increase scrolling and reduce reading efficiency, especially on small screens (Huang et al., 2018; Hou et al., 2018).
- **Margins:** Adding margins slows reading speed slightly but improves comprehension and user satisfaction, likely by reducing visual clutter and supporting better focus (Chaparro et al., 2004).
- **Inter-word and inter-letter spacing:** Increased spacing can help readers with dyslexia and visual crowding, improving speed and accuracy (Joo et al., 2018; Schneps et al., 2013; Blackmore-Wright et al., 2013; Perea et al., 2012; Galliussi et al., 2020; Rello & Baeza-Yates, 2015; Zorzi et al., 2012; Sjoblom et al., 2016). For typical readers, small increases in spacing may have minimal or mixed effects (Perea et al., 2016).

3.2 Line Length

- **Optimal line length:** Lines of 50–75 characters (or about 10–12 words) are generally optimal for reading speed and comprehension (Dyson, 2004; Schneps et al., 2013; Duchnicky & Kolers, 1983; Scaltritti et al., 2019). Shorter lines can benefit readers with dyslexia or attention difficulties, but lines that are too short or too long can disrupt reading flow and slow down reading (Schneps et al., 2013; Duchnicky & Kolers, 1983; Scaltritti et al., 2019).
- **Device and context:** On smartphones and tablets, shorter lines and increased spacing are often preferred, but excessive fragmentation can require more scrolling and reduce efficiency (Huang et al., 2018; Kwok et al., 2023; Hou et al., 2018).

3.3 Engagement and User Experience

- **Readability and engagement:** Higher readability, achieved through optimal spacing and line length, increases user engagement, satisfaction, and even social media interactions (Pancer et al., 2018; Scaltritti et al., 2019; Ling & Schaik, 2007).
- **Subjective preferences:** Users generally prefer layouts with moderate white space and optimal line lengths, reporting greater comfort and aesthetic appeal (Huang et al., 2018; Chaparro et al., 2004; Hou et al., 2018; Scaltritti et al., 2019; Ling & Schaik, 2007).

3.4 Special Populations

- **Dyslexia and visual impairments:** Increased spacing and shorter lines can significantly improve reading speed, accuracy, and comprehension for readers with dyslexia or low vision (Joo et al., 2018; Schneps et al., 2013; Blackmore-Wright et al., 2013; Perea et al., 2012; Galliussi et al., 2020; Rello & Baeza-Yates, 2015; Zorzi et al., 2012; Sjoblom et al., 2016).
- **Children and older adults:** Larger text and increased spacing benefit young children and older adults, improving speed and reducing errors (Chan & Lee, 2005; Hou et al., 2018; Hughes & Wilkins, 2000).

Key Papers

Paper	Methodology	Population	Key Results
(Huang et al., 2018)	Experimental (Latin square design)	Smartphone readers (Chinese)	Moderate white space improved reading speed and comfort; excessive spacing increased scrolling
(Chaparro et al., 2004)	Experimental (4 layouts)	Adult readers	Margins improved comprehension and satisfaction; leading affected preference, not speed
(Schneps et al., 2013)	Eye-tracking, experimental	High school students with dyslexia	Shorter lines improved speed (27%) and reduced regressions
(Scaltritti et al., 2019)	Eye-tracking, web reading	Children, adults, dyslexic readers	Larger pages and increased spacing reduced crowding, improved fixation duration
(Ling & Schaik, 2007)	Experimental (web search)	General population	Wider line spacing improved accuracy and speed in visual search tasks

FIGURE 2 Comparison of key studies on white space, line length, reading speed, and engagement.

Top Contributors

Type	Name	Papers
Author	M. Schneps	(Schneps et al., 2013)
Author	Shih-Miao Huang	(Huang et al., 2018)
Author	K. Rayner	(Rayner et al., 2010; Rayner et al., 2013)
Journal	*PLoS ONE*	(Schneps et al., 2013; Blackmore-Wright et al., 2013)
Journal	*Behaviour & Information Technology*	(Dyson, 2004; Chan & Lee, 2005)
Journal	*Annals of Dyslexia*	(Perea et al., 2012; Galliussi et al., 2020)

FIGURE 3 Authors & journals that appeared most frequently in the included papers.

4. Discussion

The evidence indicates that **moderate increases in white space and optimal line lengths enhance both reading speed and engagement** for most readers, especially in digital contexts (Huang et al., 2018; Chaparro et al., 2004; Schneps et al., 2013; Scaltritti et al., 2019; Ling & Schaik, 2007). These effects are particularly pronounced for individuals with dyslexia or visual impairments, who benefit from increased spacing and shorter lines (Joo et al., 2018; Schneps et al., 2013; Blackmore-Wright et al., 2013; Perea et al., 2012; Galliussi et al., 2020; Rello & Baeza-Yates, 2015; Zorzi et al., 2012; Sjoblom et al., 2016). However, there are diminishing returns: excessive white space can fragment text, increase scrolling, and reduce efficiency, especially on small screens (Huang et al., 2018; Hou et al., 2018). Similarly, lines that are too short or too long can disrupt reading flow (Dyson, 2004; Schneps et al., 2013; Duchnicky & Kolers, 1983; Scaltritti et al., 2019).

User preferences generally align with objective performance, favoring layouts that balance readability and aesthetic appeal (Huang et al., 2018; Chaparro et al., 2004; Hou et al., 2018; Scaltritti et al., 2019; Ling & Schaik, 2007). For web and mobile design, these findings support established guidelines recommending moderate line and paragraph spacing, clear margins, and line lengths of 50–75 characters.

Claims and Evidence Table

Claim	Evidence Strength	Reasoning	Papers
Moderate white space improves reading speed and comfort	Strong	Multiple experiments and subjective ratings	(Huang et al., 2018; Chaparro et al., 2004; Kwok et al., 2023; Chiu & Drieghe, 2023; Chan & Lee, 2005; Zhou et al., 2023; Scaltritti et al., 2019; Ling & Schaik, 2007)
Excessive white space can hinder efficiency by increasing scrolling	Moderate	Experimental studies on smartphones and small screens	(Huang et al., 2018; Hou et al., 2018)
Optimal line length (50–75 characters) maximizes reading speed and comprehension	Strong	Synthesis of empirical studies and reviews	(Dyson, 2004; Schneps et al., 2013; Duchnicky & Kolers, 1983; Scaltritti et al., 2019)
Increased spacing and shorter lines benefit dyslexic and visually impaired readers	Strong	Eye-tracking and intervention studies	(Joo et al., 2018; Schneps et al., 2013; Blackmore-Wright et al., 2013; Perea et al., 2012; Galliussi et al., 2020; Rello & Baeza-Yates, 2015; Zorzi et al., 2012; Sjoblom et al., 2016)
User engagement and satisfaction are higher with readable, well-spaced layouts	Strong	Experimental and observational studies	(Pancer et al., 2018; Scaltritti et al., 2019; Ling & Schaik, 2007)
For typical readers, small increases in inter-letter/word spacing have minimal effect	Moderate	Mixed results in skilled adult readers	(Perea et al., 2016; Sjoblom et al., 2016)

FIGURE Key claims and support evidence identified in these papers.

5. Conclusion

Moderate use of white space and optimal line length significantly improve reading speed, comprehension, and engagement for most readers, with especially strong benefits for those with dyslexia or visual impairments. Excessive spacing or poorly chosen line lengths can reduce efficiency, highlighting the need for balanced, user-centered design.

5.1 Research Gaps

While the benefits of moderate white space and optimal line length are well established, more research is needed on how these variables interact with device type, content complexity, and individual user needs, especially in multilingual and mobile contexts.

Research Gaps Matrix

Topic/Outcome	General Population	Dyslexia/Low Vision	Children	Mobile Devices	Web/Screen Context
White Space (Line/Paragraph)	18	10	7	8	15
Line Length	14	8	5	7	12
Engagement/Preference	10	4	3	5	9

FIGURE Matrix of research topics and study attributes, highlighting areas with limited research.

5.2 Open Research Questions

Future research should explore how white space and line length interact with other design variables and user characteristics to further optimize digital reading experiences.

Question	Why
How do white space and line length interact with device type and screen size to affect reading speed and engagement?	Device constraints may moderate the benefits of spacing and line length, especially for mobile users.
What are the optimal spacing and line length parameters for multilingual and non-Latin scripts?	Most research focuses on English and Chinese; other languages may require different design guidelines.
How do individual differences (e.g., age, cognitive ability, visual impairment) influence the ideal layout for digital reading?	Personalization could further improve accessibility and engagement for diverse users.

FIGURE Open research questions for future investigation on white space, line length, and reading outcomes.

In summary, a balanced approach to white space and line length is key to maximizing reading speed and engagement in digital environments, with special attention needed for accessibility and device-specific optimization.

These papers were sourced and synthesized using Consensus, an AI-powered search engine for research. Try it at https://consensus.app

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