RESEARCH ARTICLE

Beyond (Type)Face Value: A Systematic Literature Review Examining Design Factors Influencing the Legibility and Readability of Typography

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Abstract: Printed or digital text is a primary communication medium. Reading is necessary for locating, understanding, and using information in our personal and professional lives. The importance of reading makes typography essential to accessibility. The purpose of this systematic literature review was to examine design factors that influence the legibility and readability of accessible typography, resulting in 42 peer-reviewed empirical studies (2000–2025) that report on typeface design, typesetting, and other factors affecting legibility and readability of typography in Latin alphabet-based languages. Key findings include: (1) serifs are not a significant legibility factor; (2) no single type size or typeface optimizes readability for everyone in every situation; and (3) familiarity may be a significant legibility and readability factor. These results suggest that accessible typography guidelines should reflect the complexity and nuance involved in optimizing readability and identify several research gaps. Future research should explore typeface design characteristics beyond serifs within type classifications, the influence of familiarity on readability and reading skills, the potential transferability of familiarity between similar typefaces, the duration of the familiarization process, the persistence of its effects, and whether reader motivation and adaptability can outweigh these effects. Additionally, accessible typography research may benefit from studies incorporating natural reading conditions, materials that better reflect current design practices, more diverse reading measures, and in-depth qualitative approaches.

Keywords: accessibility; legibility; readability; reading; typography

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1. Introduction

Accessibility measures ensure that everyone, including persons with disabilities, can fully participate in society and have equal access to fundamental rights and freedoms (United Nations, 2006). Accessibility is a general term that describes the degree to which the design of a product, materials, device, service, or environment is usable by people with a diverse range of abilities (Harniss, 2014). Although there are many formats for information or communication, printed or digital text remains a primary communication medium. Reading is necessary to locate, understand, and use information and communications presented as text, symbols, or images (Government of Canada, 2024). Reading can also be used to acquire knowledge and learn new skills (Goldman et al., 2016). The importance of reading for communication, social participation, health and wellness, learning, employment, and overall quality of life makes typography essential to accessibility. For the purpose of this study, typography refers to the appearance and style of text and the artistic or technical characteristics of typesetting text (Clair & Busic-Snyder, 2005a). Accessible typography depends on legibility and readability. Legibility describes the degree to which a reader can recognize or identify individual letters or words (Felici, 2012). Readability describes the degree to which a reader can perceive, process, comprehend, and make meaning out of text (Felici, 2012). Legibility depends on typeface design, including features such as letter structure and letterform. Beier and Larson (2013) use the term “letter skeleton” to describe letter structure, which excludes stylistic visual details. In this review, the term letter structure is retained. In contrast, letterform refers to the visual representation of a letter, including its strokes, proportions, and design features. Readability depends on design factors such as typesetting and typeface design, as well as other non-design-based factors, including vocabulary, writing style, environmental conditions, and individual differences (Clair & Busic-Snyder, 2005b).

1.1. Accessible Typography Recommendations

The United Nations (UN) Convention on the Rights of Persons with Disabilities (CRPD) is an international human rights treaty with legal obligations to protect the rights of people with disabilities, including accessibility measures. The CRPD has been ratified by almost all the countries in the UN (United Nations, 2023); this has encouraged an international approach to accessibility, with many governments creating legislation, policies, and standards in compliance with the measures of the CRPD. With consideration of the current global response to accessibility, the most recent guidelines for Latin alphabet-based languages were reviewed from several governments and organizations worldwide. In Australia and New Zealand, these guidelines included the Australian Government (n.d.) and the Round Table on Information Access for People with Print Disabilities Inc. (Round Table, 2022), a group of public and private sector organizations, institutions, and government departments focused on accessibility. In Canada, guidelines were sourced from both the Government of Canada (2022) and the Canadian National Institute for the Blind (CNIB, 2020), a non-profit organization that supports Canadians who are blind or visually impaired. From the European Union, guidelines were identified from the Publications Office of the European Union (2023) and the European Blind Union (EBU, 2016), a non-profit organization that supports blind and visually impaired individuals across Europe. In the United Kingdom, sources included the Disability Unit (2021), part of the Cabinet Office, and the Royal National Institute of Blind People (RNIB, 2023), a leading non-profit organization that supports blind and partially sighted people throughout the UK. In the United States, guidelines were reviewed from the American Printing House for the Blind (APH, 2022), a non-profit organization that supports blind and visually impaired individuals, and Web Accessibility In Mind (WebAIM, 2020), a non-profit organization from the Institute for Disability Research, Policy & Practice at Utah State University. WebAIM's accessibility tools and recommendations are web-focused and guided by the Web Content Accessibility Guidelines (WCAG). Finally, guidelines were included from the United Nations (2022), which reflect international commitments to accessibility.

The primary typography recommendations in these accessible typography guidelines often concern, as summarized below, serifs, typeface, type style, letter case, type size, spacing (letter and line), and line length.

Serifs. The UN (2022) asserted that serifs may make reading more challenging and interfere with letter recognition. The Publications Office of the European Union (2023) advised that serifs may impede letter identification by distracting from letter shapes and warned that this effect may be further compounded on screen due to display issues such as pixelation. Recommendations such as these may lead to the conclusion that serifs cannot be accessible.

Typeface. Sans serif typefaces are most often recommended for accessibility, with Arial frequently suggested for Clear Print documents. Round Table (2022) recommended using Arial, Verdana, Helvetica, and Calibri. The CNIB (2020) suggested using Arial or Verdana. The RNIB (2023) stated that Arial set at 14 pt is ideal. The repeated recommendations for the Arial typeface may suggest that it is optimally accessible and may support the bias towards sans serif typefaces.

Type style. Many accessible typography guidelines suggest limiting the use of bold or italic type styles for different reasons. Regarding bold type styles, the Government of Canada (2022) recommended using bold type styles strictly for emphasis in print and on-screen applications, and noted that bold text could confuse screen readers. Regarding italic type styles, the RNIB (2023) advised against using italics in print documents. Additionally, WebAIM (2020) warned that bold or italic type styles may make text more challenging to read on-screen and that each variation of type style requires some adjustment from the reader. These recommendations restrict the use of bold and italic type styles, which may lead to the assumption that these styles are not accessible.

Letter case. The use of uppercase letters is often discouraged in accessible typography guidelines. The Disability Unit (2021) advised, without explanation, that blocks of uppercase letters should not be used in titles or body copy of print documents. The Government of Canada (2022) stated that uppercase letters might confuse screen readers or other assistive devices and make on-screen reading more challenging, particularly for people relying on word shapes. These suggestions may lead to the belief that uppercase letters are not accessible.

Type size. Some of the recommendations regarding type size in accessible typography guidelines are vague. The CNIB (2020) said: “Bigger is better. Keep your text large, between 12 and 18 points, depending on the font” (#3 Point Size section) for documents. The Australian Government (n.d.) suggested 12 pt or larger for documents without further guidance. WebAIM (2020) simply advises against using small font sizes on-screen. The idea, “bigger is better” may be too simplistic to address how type size interacts with other individual or situational factors that affect the readability of textual information.

Spacing. Some guidelines clearly articulate the potential benefits or consequences of spacing, while others are brief or make no mention of spacing. In some cases, letter spacing (tracking) or line spacing (leading) is used to compensate for increased type sizes by fitting more characters per line or more lines per column. The Publications Office of the European Union (2023) cautioned that insufficient spacing may impede letter recognition in both print and on-screen formats. The Disability Unit (2021) suggested accommodating limited space on the page by reducing the amount of information before reducing type size; this suggestion appears to prioritize type size and spacing over content for accessibility. The amount of information may impact the layout, design, and overall accessibility of materials.

Line length. Some accessible typography guidelines directly address line length or indirectly address it with suggestions on whether to use columns. The EBU (2016) and the CNIB (2020) both recommended using columns in print documents to improve readability by reducing eye movement and dependence on peripheral vision. However, the APH (2022) advised against using columns, and stated that shifting from the end of a line to the beginning of the next when reading is challenging for people with low vision, as columns can shorten line lengths and increase the frequency of this task. These contradictory recommendations for line length or columns require some clarification or further contextual information.

1.2. Purpose and Significance of This Literature Review

Given the complexity of the interactions between typography, diverse readers, and contextual factors that influence readability and accessibility, a one-size-fits-all approach to accessible typography may not be possible. However, guidelines suggesting 'best practices' merit exploration. By taking a systematic approach to investigating the research on design-based influences of accessible typography, we can identify main concepts addressed in the literature, and potentially identify knowledge gaps, with the ultimate goal of enhancing understanding regarding inclusive design and communication. Therefore, this review aims to answer the research question: What design factors most influence the legibility and readability of accessible typography?

By exploring the body of work related to the impact of typeface design and typographic variables in modern Latin alphabet-based languages on participants' reading (i.e., legibility or readability of words, not characters in isolation), and applying these findings to address concerns in accessible typography guidelines regarding the accessibility of serifs, typefaces, type styles, uppercase letters, and other traditional typesetting options, this literature review aims to offer insight into design practices that may advance evidence-based guidance on optimizing typography for accessibility. The findings may also highlight typography's significance in everyday life and the potential social impact of design.

2. Methods

2.1. Eligibility Criteria

Table 1. Literature inclusion criteria.

Category	Inclusion criteria
Literature type	Empirical studies using qualitative, quantitative, or mixed methods
Publication source	Peer-reviewed journal articles in English
Publication dates	Peer-reviewed journal articles published from year 2000 to 2025
Study design	Studies examining the impact of typeface design variables and typographic variables in modern Latin alphabet-based languages on participants' reading in print or on-screen, i.e., legibility or readability of words, not characters in isolation. Studies using specialist typefaces were excluded.
Participants	Participants aged 15 to 65, of any gender or geographical location, with normal, corrected to normal, or low vision and individual differences such as dyslexia, who completed studies in native and non-native language contexts.

Literature inclusion criteria for this review (see Table 1) exclusively featured empirical studies using qualitative, quantitative, or mixed methods, published in peer-reviewed journal articles in English between 2000 and 2025. Limiting the publication date to 2000 ensured the articles were current and relevant to modern technology and contexts.

2.2. Search Strategy

A review strategy was developed in consultation with the Social Science, Humanities, and Education librarian at Ontario Tech University. It included search terms focusing on typography and its reading-related effects (see Table 2), search tools (databases and search engines), and search options or limits.

Table 2. Literature search terms.

Category	Search terms
Typography (area of interest)	(typograph* OR typeface OR font)
Reading consequences	(legibility OR readability OR accessibility OR “reading speed”)

The search strategy included four stages. First, searches were conducted on education databases: Education Source via EBSCOhost and ERIC via ProQuest. Second, searches were conducted on multidisciplinary databases with education coverage including APA PsycInfo via ProQuest, and Web of Science via Clarivate Analytics. Third, results from Google Scholar (multidisciplinary scholarly search engine) triangulated database search results. The Google Scholar results were limited to the first 100 due to the lack of advanced search options and the quantity of the search results. Finally, the references in the qualifying articles were hand-searched as an additional search strategy.

2.3. Data Collection Process

A database was created to store and manage the data from the reviewed studies. A multi-step procedure was implemented to populate the database. First, essential study characteristics were documented, including (1) author, (2) year of publication, (3) title of publication, (4) title of journal, and (5) institutional affiliation. Second, participant information such as (6) geographic location, (7) language, (8) age, and (9) participant disabilities (if applicable) were entered into the database. Third, additional information from the reviewed studies was collected, including (10) research objective(s), (11) research methods, (12) key findings/outcomes, and (13) results. Fourth, the (14) data collection tools, (15) independent, and (16) dependent variables were compiled and categorized. Finally, information was collected on the typefaces used in each study, including any findings based on performance, preference, or other outcomes.

2.4. Synthesis Methods

The synthesis process followed several steps outlined in the PRISMA Expanded Checklist (Page et al., 2021). The first step in the process involved data charting the extracted information from the reviewed studies in detail. After the data charting was complete, figures were made to visualize the data and tallied statistics. The columns and categories of the data charts were analyzed for commonalities between the data from the reviewed studies and the information from the existing accessible typography literature and guidelines. The accessible typography literature and guidelines provided context to help identify and organize patterns grounded in design and accessibility. As a graphic designer, and as educators and education researchers, our knowledge and experience in graphic design and typography informed the reflexive approach to thematic analysis. This expertise also facilitated the navigation of sources, and supported the interpretation of findings to address the research question and identify gaps in the literature. The findings were then organized into themes to provide an in-depth understanding of how the typeface design and typographic variables affected people's reading performance and experiences, which may have influenced their perspectives and preferences.

3. Results

3.1. Study Selection

The systematic literature search initially resulted in 802 peer-reviewed papers (see Figure 1). After removing 132 duplicates, the remaining 670 articles were screened using the title and abstract as a guide. As a result, 54 articles met the specific search criteria based on the guiding research question (i.e., What design factors most influence the legibility and readability of accessible typography?) and qualified for full-text screening. Upon completion of full-text screening, 32 peer-reviewed articles met the inclusion criteria as described earlier. These results were cross-referenced with the first 100 search results from Google Scholar, which yielded another 10 articles for screening, resulting in the inclusion of two additional articles. Finally, handsearching the reference lists of these 34 publications resulted in the identification of eight additional articles meeting the inclusion criteria for screening. In total, 42 articles were included in this systematic literature review. Figure 1 provides a visual representation of the study selection process for this literature review.

3.2. Findings Responding to the Research Question

3.3. Reviewed Studies Overview

The reviewed studies (*N* = 42) were published in 26 academic journals with contributions from 103 authors. Appendix A: Empirical Studies on Legibility and Readability

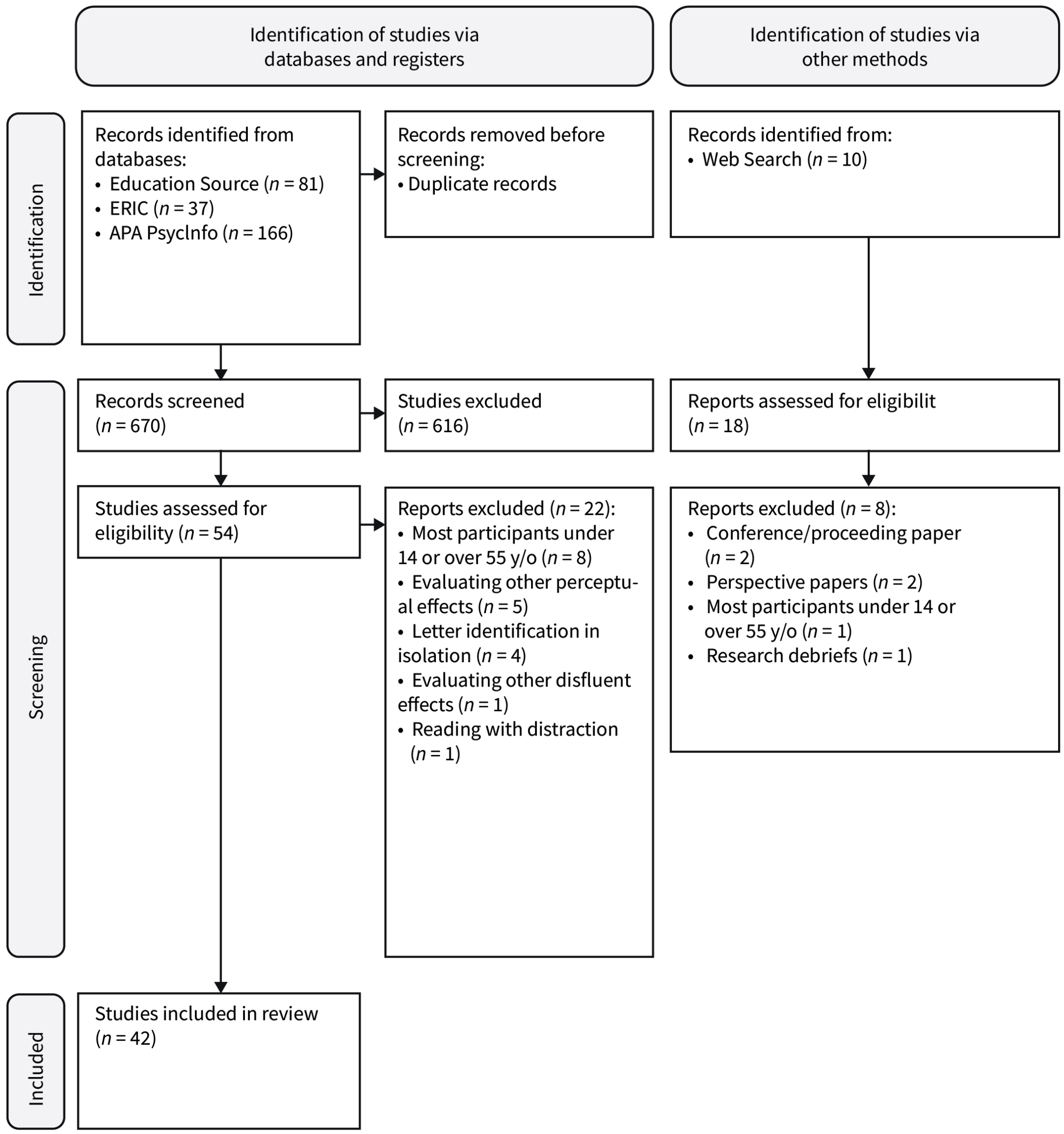

Figure 1. PRISMA 2020 flow diagram.

Using Quantitative Methods (n = 30) and Appendix B: Empirical Studies on Legibility and Readability Using Both Quantitative and Qualitative Methods (n = 12) provide the four data items for the reviewed studies: (1) Participants; (2) Research Objective; (3) Research Measurements; and (4) Key Findings/Results. Half of the studies (n = 21) were published in the past decade (see Figure 2).

Participant Demographics

The 42 reviewed studies were conducted in 10 countries: Belgium, Denmark, India, Iran, Malaysia, Nigeria, Slovenia, Spain, United Kingdom, and the US (see Figure 3). Most of the studies were conducted in English (n = 36), and some were conducted in Danish (n = 5) and German (n = 1).

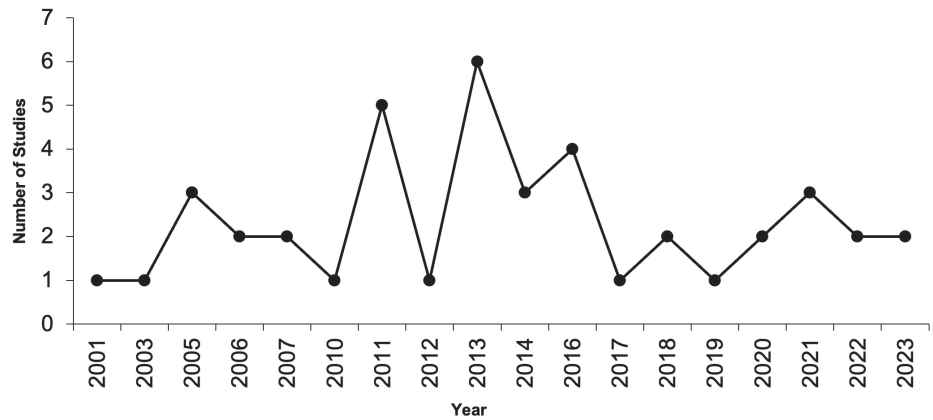

Figure 2. Reviewed studies distribution by year ($N = 42$).

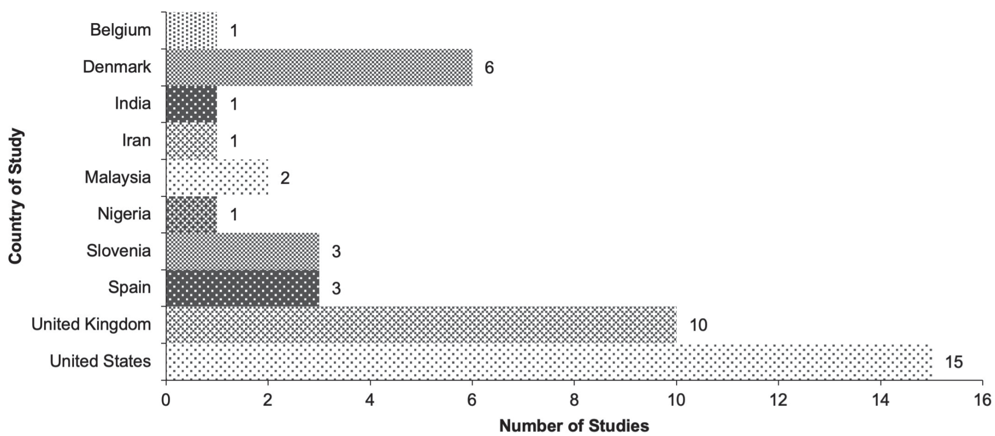

Figure 3. Reviewed studies distribution by country ($N = 42$).

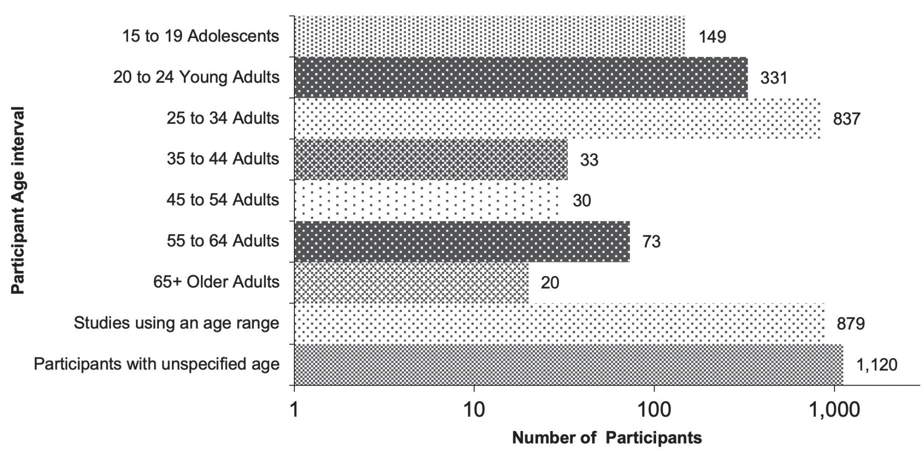

Figure 4. Reviewed studies participant distribution by age ($N = 3{,}323$).

Note. The age intervals are based on the UN's (1982) *Recommended standard international age classifications,* for reporting a medium level of detail, as outlined in the *Provisional Guidelines on Standard International Age Classifications*. The age categories are based on the UN's (n.d.) definition of "youth" and Statistics Canada's (2023) *Age Categories, Life Cycle Groupings*.

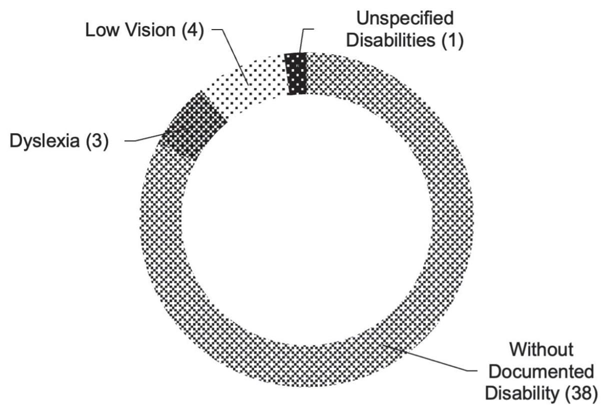

Figure 5. Reviewed studies participant distribution by disability ($N = 42$).

The 42 reviewed studies yielded a total of 3,323 participants. The participants from 26 studies ($n = 2{,}203$) fit into the age categories: youth (including adolescents and young adults), adult, and senior (United Nations, n.d.; Statistics Canada, 2023) (see Figure 4). Participant age was not specified in 16 studies ($n = 1{,}120$). Eight studies included participants with disabilities, accounting for approximately 7% ($n = 238$) of the total participants (see Figure 5). Three studies included participants with and without dyslexia ($n = 53$) (French et al., 2013; Krivec et al., 2020; Schneps et al., 2013). Four studies included participants with low vision ($n = 40$) (Arditi & Cho, 2005, 2007; Kanonidou et al., 2014; Minakata et al., 2023), and one included participants with unspecified disabilities ($n = 145$) (Sieghart, 2023).

Reviewed Studies Data Collection Tools

Nine data collection tools were used in the reviewed studies (see Figure 6, Appendix C): eye movement tracking ($n = 9$), questionnaires ($n = 12$), measures of reading accuracy

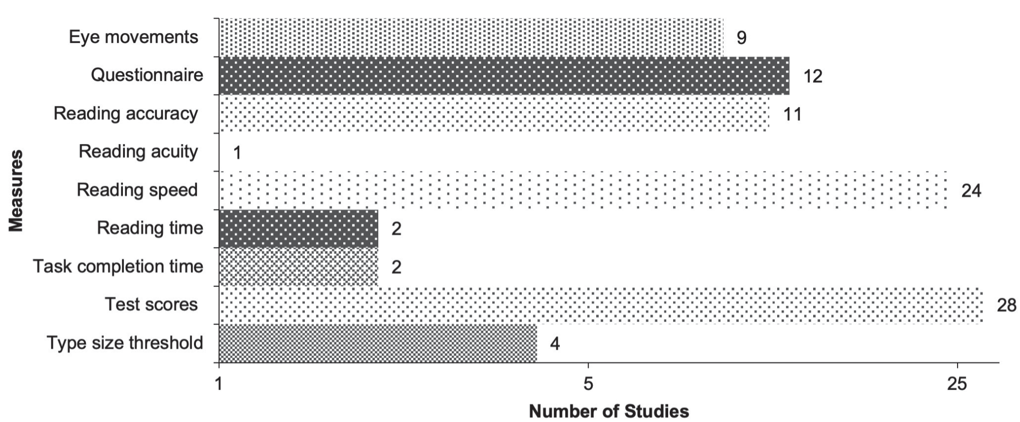

Figure 6. Reviewed studies data collection tools ($N = 42$).

(*n* = 11), reading acuity (*n* = 1), reading speed (*n* = 24), reading time (normal, fast, or glance reading) (*n* = 2), task completion time (*n* = 1), test scores (*n* = 14), and type size threshold (*n* = 4).

Reviewed Studies Independent Variables

Thirty-three of the reviewed studies examined factors of legibility with seven independent variables of typeface design: letter structure (*n* = 3), letter width (*n* = 2), serifs (*n* = 19), stroke contrast (n = 3), stroke width (*n* = 3), typeface (*n* = 28), and type style (*n* = 11) (see Appendix D). Serifs and typeface variation are the two most featured typeface design variables in the reviewed studies.

Twenty-nine of the reviewed studies examined 10 independent typographic variables: color (*n* = 2), columns (*n* = 1), letter case (*n* = 4), letter spacing (*n* = 6), line length (*n* = 9), line spacing (*n* = 8), paragraph spacing (*n* = 4), text alignment (*n* = 1), type size (*n* = 18), and word spacing (*n* = 2) (see Appendix E). Type size is the most featured typographic variable by a considerable margin.

Thirty-two studies featured the following 13 independent non-typographic variables which are briefly described below: age (*n* = 1), devices (*n* = 1), display variables (*n* = 5), dyslexia (*n* = 3), lexical variables (*n* = 4), pre-set/self-set text (*n* = 1), reading time (*n* = 3), study variables (*n* = 1), test variables (*n* = 7), typeface familiarity (*n* = 2), undisclosed disability (*n* = 1), vision variables (*n* = 7), and visual crowding (*n* = 1). Display variables included the number of colors, display format, on-screen position, font smoothing (anti-aliasing), and print or digital format. Lexical variables included high- or low-frequency words, word relatedness, and words/non-words. Test variables included test expectancy, question type, and time intervals between study and testing. Study variables included repeated/non-repeated reading and varied study times. Vision variables included low vision, vision loss, and visual location (normal or peripheral), and reading time describes the time duration for reading. It varied from glance to interlude to long-form reading. Test and vision variables were the two most studied non-typographic variables.

Reviewed Studies Typography

The reviewed studies, in total, involved 52 typefaces (see Appendix F, Appendix G). Two studies did not specify the experimental typefaces (Geller et al., 2018; Risko et al., 2011), and seven studies examined customized typefaces (Arditi & Cho, 2005; Beier & Larson, 2013; Beier & Oderkerk, 2021; Dyson & Beier, 2016; Geller et al., 2018; Minakata & Beier, 2022; Minakata et al., 2023). Wallace et al. (2022) included the most (*n* = 16) typefaces. The most used typefaces in the reviewed studies were Times New Roman/ Times (*n* = 14), Arial (*n* = 11), Georgia (*n* = 7), and Verdana (*n* = 6), which is the only one in

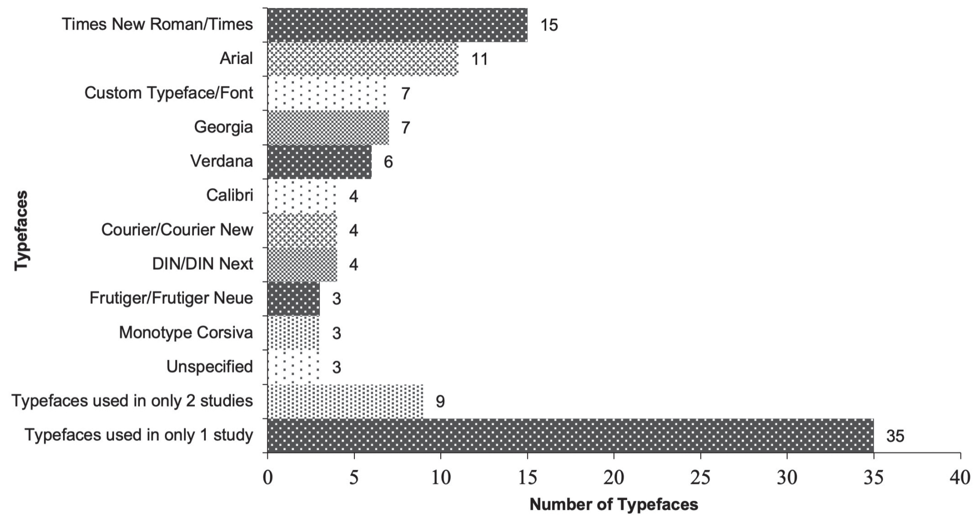

Figure 7. Reviewed studies typeface distribution by typeface (*N* = 42)

Note. Typefaces used in only two studies (*n* = 9): Avenir/Avenir Next, Consolas, Gill Sans/Gill Sans MT, Helvetica, Lucida Sans, Open Sans, Trebuchet, Swiss 721, and Univers/Univers Next Pro. Typefaces used in only one study (*n* = 34) are: Amasis, Andale Mono, Avant Garde, Bembo, Bodoni MT, Bookman, Brush Script, Cambria, Comic Sans, Demos, Eurostile, Franklin Gothic, Garamond/EB Garamond, Haettenschweiler, Harrington, KBH Display/Text Regular, Lato, Lucida, Lucida Bright, Meta Office Pro, Monaco, Montserrat, Myriad, Neuzeit Office, Noto Sans, Oswald, Palatino, Poyner Gothic, Roboto, Tahoma, Thesis, Script MT Bold, Speak Office Pro, and Utopia. For complete information on the typeface distribution in the reviewed studies, see Appendix F and Appendix G.

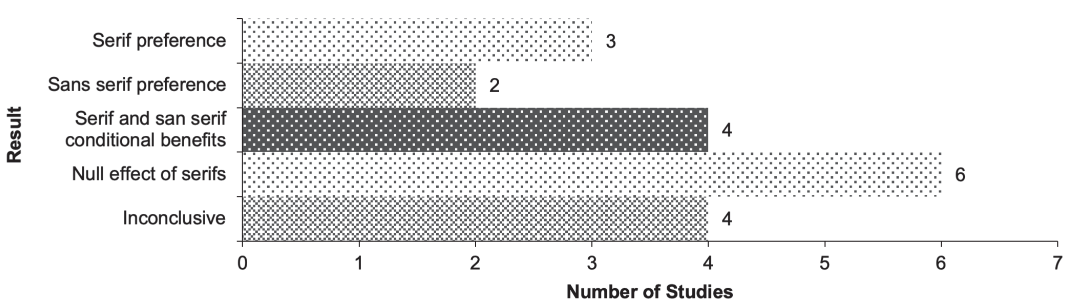

Figure 8. Results from the reviewed studies comparing serif and sans serif typefaces (*N* = 19).

the top four typefaces designed specifically for screen (see Figure 7). Nineteen studies evaluated and compared serif and sans serif typefaces (see Figure 8, Appendix H).

The remainder of the findings of this literature review will address design factors influencing legibility, followed by design factors affecting the readability of accessible typography.

Design Factors Influencing Legibility

Serifs. Serifs are a typeface design characteristic that is a primary legibility concern. However, some studies reported that serifs had no significant effect on legibility or reading performance measures (Bernard et al., 2003; Minakata & Beier, 2022; Perea, 2013; Sheedy et al., 2005; Soleimani & Mohammadi, 2012); including people with low vision (Arditi & Cho, 2005). Some studies reported inconclusive findings regarding serifs (Ling & van Schaik, 2006; Minakata et al., 2023; Pušnik et al., 2016b; Slattery & Rayner, 2013), while others found conditional benefits for both serif and sans serif typefaces (Banerjee et al., 2011; Sieghart, 2023; Ukonu et al., 2021; Wallace et al., 2022).

Typeface. The reading performance results of serif and sans serif typefaces are inconsistent in the research; nevertheless, sans serif typefaces were often preferred by participants (Banerjee et al., 2011; Krivec et al., 2020; Ukonu et al., 2021; Wallace et al., 2022), though there was no connection between preference and performance (Sieghart, 2023; Wallace et al., 2022). Gasser et al. (2005) found that serif typefaces improved test scores and memory, while other studies found a null effect of typeface (Lonsdale et al., 2006; Slattery & Rayner, 2010).

Type style. Dyson and Beier (2016) found that bold typefaces increased reaction times in a word recognition task when alternated with words in regular weight. They also concluded that bold type styles were more effective than italics for headings (Dyson & Beier, 2016). Italics were found to both have a null effect on word recognition tasks (Dyson & Beier, 2016) and impair reading speed (Slattery & Rayner, 2010).

Letter structure. Beier and Larson (2013) concluded that aesthetics and subjective preferences may influence letter structure more than performance-based concerns. They suggested that increased familiarity with uncommon letter structures could improve their legibility.

Letter width. One study found that reading condensed typefaces led to fewer but longer fixations, while extended typefaces led to more fixations; however, variations in letter width did not significantly affect reading speed (Minakata & Beier, 2021). Similarly, Gasser et al. (2005) reported a null effect on reading performance when using typefaces with varied letter widths. Minakata and Beier (2021) suggested that readers can efficiently and effectively compensate for, and adapt to, differing levels of legibility.

Stroke. One study found that lighter than regular stroke weight impaired reading speed with the Radner Reading Chart (Beier & Oderkerk, 2019). However, Bernard et al. (2013) found that increasing or decreasing the stroke weight had a null effect on reading speed in central vision, while heavier stroke weights impaired reading speed in the periphery. One study reported that bold typefaces with high stroke contrast reduced performance in a letter recognition task (Beier & Oderkerk, 2021). One study found that, in general, typefaces with low stroke contrast were read at smaller sizes than typefaces with high stroke contrast (Minakata & Beier, 2022). Two studies (including the previous one) found that serif typefaces with high stroke contrast and sans serif typefaces with low stroke contrast performed best in word recognition tasks for readers with normal vision (Minakata & Beier, 2022; Minakata et al., 2023). Minakata et al. (2023) observed the opposite for readers with low vision; serif typefaces with low stroke contrast and sans serif typefaces with high stroke contrast performed best in word recognition tasks for readers with low vision.

Design Factors Influencing Readability

Type size. Type size is a typographic variable that is a primary readability concern, especially for readers with disabilities. Krivec et al. (2020) reported that sans serif typefaces and larger type sizes were perceived as more readable by dyslexic readers according to their subjective judgments captured through questionnaires. However, Bernard et al. (2003) reported no effect of type size on the reading speed of young adults or readers without documented disability. Soleimani and Mohammadi (2012) found no effect of type size on processing time or comprehension and recall test scores, but reported that participants read text set in 12 pt faster than text set in 10 pt. Smaller type sizes adversely affected word recognition for glance readers in one study (Dobres et al., 2018) and reading speed for people with vision loss in another (Kanonidou et al., 2014). Sheedy et al. (2005) found that reading performance increased with type size up to 10 points, which was optimal. Sieghart (2023) indicated that for readers with undisclosed disabilities, 12 pt is optimal.

Letter case. Uppercase text was read faster than lowercase or mixed-case text at smaller type sizes (Arditi & Cho, 2007; Pušnik et al., 2016a) and was more readable for people with vision loss; however, at larger sizes, reading performance was similar across all case conditions (Arditi & Cho, 2007). Arditi and Cho (2007) proposed that uppercase letters, being inherently larger than lowercase letters, maintain greater readability at smaller type sizes. It is possible that the larger and more open form of uppercase letters contributes to them being more easily recognizable.

Spacing. Crowding can be moderated with letter or line spacing. The results of two studies suggest decreased letter spacing may impair reading speed (Beier & Oderkerk, 2019) and increased letter confusion (Liu & Arditi, 2001). Risko et al. (2011) found that increased letter spacing beyond regular induced serial processing and adversely affected word recognition tasks. Schneps et al. (2013) found that normal letter spacing yielded better performance across several eye-tracking measures, including fixation count and regressive saccades. However, increased letter spacing enabled “weaker” readers to perform nearly as well as stronger readers. Slattery & Rayner (2013) found that regular spacing provided their participants the best reading speed and eye movements.

Layout. Four studies found that typographic layouts that had spacing and line length variations were observed to affect reading speed, accuracy, and test results (Lonsdale, 2007, 2014, 2016; Lonsdale et al., 2006). In one study, medium line lengths were read faster than shorter line lengths (Dyson & Haselgrove, 2001). Schneps et al. (2013) reported that both participants with dyslexia and those without documented disabilities preferred shorter line lengths for reading, as indicated by solicited judgments.

4. Discussion

The findings are discussed within the context of this literature review's overarching aim, which was to explore the body of work related to design factors that most influence the legibility and readability of accessible typography.

4.1. The Serif and Beyond: Critical Factors Influencing Legibility and Readability

Based on the 42 reviewed studies, there were no studies that documented significant differences in reading performances between serif and sans serif typefaces due solely to the presence or absence of serifs. Just over half of the reviewed studies that evaluated typefaces with and without serifs found a null effect of serifs on legibility or reading measures, or had inconclusive results (Arditi & Cho, 2005; Bernard et al., 2003; Ling & van Schaik, 2006; Minakata & Beier, 2022; Minakata et al., 2023; Perea, 2013; Pušnik et al., 2016b; Sheedy et al., 2005; Slattery & Rayner, 2010; Soleimani & Mohammadi, 2012); this includes a null effect of serifs on reading for people with low vision (Arditi & Cho, 2005). One study observed better performance for sans serif typefaces in word recognition tasks (Moret-Tatay & Perea, 2011), and another found the same effect in recall tests (Hojjati & Muniandy, 2014), while four studies observed that serif typefaces improved reading speed both on-screen (Banerjee et al., 2011; Slattery & Rayner, 2010; Wallace et al., 2022) and in print (Ukonu et al., 2021). Participants also performed better with serif typefaces in word recognition tasks (Pušnik et al., 2016a) and recall tests (Gasser et al., 2005). Additionally, two studies reported contradictory results, as both the best and worst performing typefaces according to each study's measures of legibility and readability were sans serifs (Sheedy et al., 2005; Sieghart, 2023). These inconsistent results suggest that serifs may or may not be helpful, depending on the reader and context, and that other typeface design characteristics beyond the presence or absence of serifs may also affect reading. They effectively isolated the serif variable using custom-designed typefaces that differed only in the presence or absence of serifs. While these experimental typefaces are not commercially available and do not reflect real-world typefaces, these findings offer a practical foundation for moving beyond the serif versus sans serif debate. The presence of serifs in a typeface may represent design characteristics typical to different type classifications. Currently, there is no universally accepted system for type classification (Clair & Busic-Snyder, 2005c). However, elementary type classifications from the 19th century (Clair & Busic-Snyder, 2005c;

Serif Type Classifications

Humanist or Old Style

Humanist or Old Style serif type set in Times New Roman / Garamond

Transitional

Transitional serif type set in Baskerville

Modern

Modern serif type set in Didot

Egyptian or Slab Serif

Egyptian or Slab Serif type set in Courier New / American Typewriter

Sans Serif Type Classifications

Humanist

Humanist sans serif type set in Optima

Transitional

Transitional sans serif type set in Helvetica Neue

Geometric

Geometric sans serif type set in Futura

Figure 9. Serif and sans serif type classifications.

Lupton, 2010a) categorize type into broad classes such as serif, sans serif, script and cursive, and display and decorative (Clair & Busic-Snyder, 2005c). The typeface design characteristics of the type classifications are informed by the design influences of historical periods. Primary serif type classifications are humanist or old style, transitional, modern, and Egyptian or slab serif, while primary sans serif type classifications are humanist, transitional, and geometric (Lupton, 2010a). Figure 9 visually displays the elementary serif and sans serif type classifications.

The different type classifications have design characteristics beyond the presence or absence of serifs and could influence the legibility of the typeface. For example, the letterforms, including the typical stroke contrast of an individual type classification may influence the legibility of a typeface depending on the reader. As seen in Figure 9, humanist or old style serif typefaces have organic letterforms, smaller serifs, and low stroke contrast (Clair & Busic-Snyder, 2005c). Transitional serif typefaces have less organic letterforms, more prominent serifs, and increased stroke contrast

(Clair & Busic-Snyder, 2005c). Modern serif typefaces have more geometric letterforms, thin square serifs, and high stroke contrast (Clair & Busic-Snyder, 2005c). Slab serif typefaces have less organic letterforms, heavy square serifs, and low stroke contrast (Clair & Busic-Snyder, 2005c). Humanist sans serif typefaces have some organic characteristics and moderate stroke contrast, transitional sans serif typefaces have fewer organic characteristics and no stroke contrast, and geometric sans serif typefaces have geometric characteristics and no stroke contrast (Lupton, 2010a). The interaction between letterforms and different typeface design characteristics may make some specific type classifications more legible than others.

No single type size is optimal for all typefaces or readers. Type size is a primary concern for readability, and may determine readability for people with low vision (Arditi & Cho, 2007). However, bigger is not always better. Exceeding the optimal type size does not further increase readability (Sheedy et al., 2005), and no universal type size is ideal across all conditions (Sieghart, 2023). Sheedy et al. (2005) identified 10 points as optimal, and Sieghart (2023) reported 12 points as optimal. These results are difficult to generalize, as both studies used point sizes for the type in their experimental materials, and as noted by van der Waarde & Thiessen (2025), comparing typefaces using point size does not yield valid data. Consideration should be given when using point size to describe experimental type sizes, as x-height can vary substantially between typefaces at the same point size (van der Waarde & Thiessen, 2025). When comparing typefaces, a more accurate measure of perceived type size may be x-height in millimetres for print, and visual angle (in minutes of arc) for screen-based text. Nevertheless, the findings may remain valid for the specific typefaces and sizes tested in each study.

Additionally, concerns about the legibility of serifs, in whole or in part, may date back to the limited capabilities of older low-resolution displays. At smaller type sizes, the details of serif typefaces were often reduced or poorly rendered on lower-resolution displays (Bernard et al., 2003). Figure 10 presents serif and sans serif type samples set at 12 pt, 14 pt, and 16 pt, rendered at low (72 ppi) and high (300 ppi) resolution to visually compare the amount of detail reproduced at different resolutions. Blurred or poorly reproduced serif characters may have been more challenging to decipher, and may have influenced past subjective preferences and biases for sans serif typefaces. However, the resolution of some modern displays now exceeds that of high-resolution print, potentially making objective legibility concerns about serifs obsolete. Modern display technology allows faithful reproduction of serifs and other typeface design characteristics across print and digital media without compromising their details and the message of the rendered text, which may increase design possibilities and the accessibility of serif typefaces.

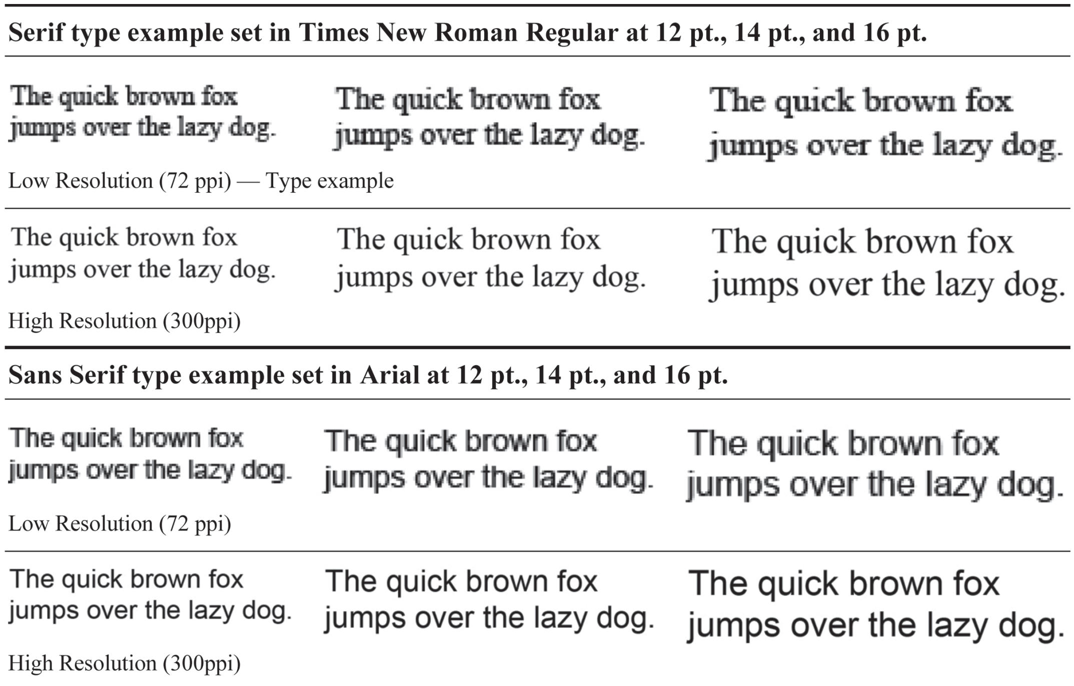

Figure 10. Serif and sans serif typefaces reproduced at low (72 ppi) and high (300 ppi) resolution.

Based on the literature review of 42 peer-reviewed studies, the design factors that most influence text legibility and readability vary for individuals in different situations. Optimizing legibility and readability depends on a combination of the reader, their individual differences and needs, and other environmental or situational factors. Surprisingly, as seen in the findings, the most influential factor in determining individual legibility and readability may be familiarity (Slattery & Rayner, 2010).

4.2. Familiarity

The research implicates familiarity as a major legibility factor (Slattery & Rayner, 2010; Ukonu et al., 2021). Familiarity was found to improve reading performance (Ukonu et al., 2021), although two other studies reported no effect of familiarity (Sieghart, 2023; Wallace et al., 2022). In some cases, the effects of familiarity may be obscured by people's ability to accommodate and adapt to different levels of legibility and readability. People can effectively adapt their reading to accommodate different levels of legibility without affecting reading performance (Minakata & Beier, 2021). However, people tend to read better with typefaces that are familiar (Zineddin et al., 2003). The potential of familiarity as a primary legibility factor raises several questions. First, if familiarity is a major legibility factor, should readers be limited to typography they are currently familiar with, or should they be familiarized with new typography? Expanding and developing familiarity with a wide range of typefaces may be beneficial. Second, does familiarity with more typefaces enhance reading skills? Familiarity with various typefaces may provide more experience with letter structure variations which may augment reading skills. Third, are the effects of familiarity transferable to similar typefaces? Familiarization effects could apply to typefaces in the same type classification or between those typefaces that are visually similar. How long is the familiarization process? Is familiarization progressive? Does it happen in minutes, hours, days, weeks, months, or years? How long do the familiarity effects last? Is the familiarization process with new typography easier for individuals who are frequent long-form readers? Investigating the familiarization process could improve understanding of how familiarity influences readability and whether familiarity effects are negated by a reader's motivation to access important or pertinent information. This suggests that, in some cases, a reader's adaptability and capacity to accommodate varying levels of legibility and readability may outweigh the benefits of familiarity. Future research on typography and familiarity has the potential to inform new accessibility guidelines by accounting for and leveraging the effects of both familiarity and adaptability on reading performance.

4.3. Towards Accessible Typography

The findings from this literature review suggest that there is no one-size-fits-all legibility or readability recommendation that optimizes the accessibility of typography for everyone in every situation. The lack of consensus in accessible typography research suggests that a typeface's impact is contextual, affecting individuals differently. For example, Minakata et al. (2023) assessed legibility using a word identification task with custom-designed typefaces that isolated serif and stroke contrast variables. They found that participants with low vision performed best with serif typefaces featuring low stroke contrast and sans serif typefaces with high stroke contrast. In contrast, Minakata and Beier (2022), using both a word identification and a lexical decision task with similarly controlled typefaces, found that participants with normal vision performed best with serif typefaces with high stroke contrast and sans serif typefaces with low stroke contrast. In the context of accessible typography, word identification tasks may have limited internal and ecological validity. Word frequency and familiarity may act as confounding factors, and these tasks involve isolated words rather than continuous text, which may not reflect real-world reading. The results from Minakata et al. (2023) and Minakata and Beier (2022) reflect the complex and nuanced interaction between typographic and individual factors, which may be addressed, mitigated, or navigated through design. There are approaches that may address the relationship between the dynamic factors influencing reading experiences, such as personalized typography. However, accessibility depends on design and the individual reader. Design serves as one means to enhancing or optimizing accessibility.

The mixed results in accessible typography research suggest that personalized typography and reading experiences may help to increase accessibility. In this context, personalized typography refers to text with reader-adjustable typesetting, which may include options for typeface, size, spacing, and other visual characteristics. Personalized typography might address the complexities and nuances of the interactions between typography, individual, and situational factors (Wallace et al., 2022). While personalized typography also accounts for the potential aesthetic, artistic, and emotional resonance of design materials with people, it raises several concerns. First, personalized typography relies on information and communication technology (ICT) and is exclusive of print. Print media remains essential, we interact with and occupy physical environments that require signage, wayfinding, and other printed material for social participation and development. Second, the dependence on ICT-based solutions privileges accessibility, potentially reinforcing the digital divide. The digital divide is the gap between people with and without ICT access (Laufer et al., 2021; Haight et al., 2014; van Deursen & van Dijk, 2019). The digital divide reflects structural social inequalities, including but not limited to income, race, geographic location, age, and education (Laufer et al., 2021; Haight et al., 2014). The lack of ICT access leads to a digital literacy gap, which limits ICT skills and opportunities to benefit from ICT (van Deursen & van Dijk, 2019). Accessibility solutions must not compound inequalities or create barriers to accessibility.

Finally, based on the findings of this literature review, it appears that the efficacy of personalized typography is still being determined. Personalized readability options for type size and spacing may be more beneficial than options for selecting personalized typefaces. Krivec et al. (2020) examined personalized typography by allowing participants to self-set type size, spacing, and alignment using a web-based adaptation of Tinker's reading test (Tinker, 1963) to measure reading speed and accuracy, in combination with a word identification task in which participants detected illogical words within paragraphs. The study found that personalized typography did not significantly affect reading speed but improved comprehension. While Tinker's reading test demonstrates strong internal validity, both it and the word identification task may not reflect typical reading conditions, which limits the generalizability of its findings to everyday reading contexts.

Wallace et al. (2022) conducted an extensive study on personalized typography, which found that selected typeface options improved reading performance. However, participants' chosen typefaces were not always the best-performing (Wallace et al., 2022). The study was conducted remotely with a large and diverse sample size who completed the experiment in natural environments using their own devices. The study controlled for type size by normalizing all typefaces to the same x-height. Although 16 typefaces were included, only three were serif typefaces. Including more serif typefaces might provide greater insight into serifs and other typeface design characteristics. Furthermore, the study may overemphasize reading speed as an indicator of reading performance.

Additionally, personalized typography selections would be informed by subjective readability, which is not always performance-based (Bernard et al., 2013; Ling & van Schaik, 2006; Sieghart, 2023; Wallace et al., 2022). The dynamic nature of personalized typography has the potential to increase accessibility for those with ICT access and skill. However, appropriate accessibility approaches should also consider print media. Physical print media remains essential for accessibility in all areas of life.

Accessibility guidelines make many recommendations based on research evidence. However, based on the findings of this literature review, some of the recommendations could be clarified with more detailed information and context. These recommendations are often taken literally and, in those cases, may adversely affect accessibility and design in several ways. First, these recommendations may influence the general public's perceptions, preferences, and judgments on design and what is considered accessible. Second, these recommendations encourage constrained design, reducing visual expression or hierarchy, which may not necessarily enhance accessibility. Finally, some of these accessibility recommendations limit design and visuals in a way that fails to consider the artistic and emotional aspects of people, especially persons with disabilities. Persons with disabilities may prioritize accessibility, but may also require visually appealing materials that engage, excite, and create interest or provoke an emotional response and connection. Accessibility recommendations, like design, should be human-centred and account for the artistic and emotional aspects of all people and not only focus on their ability or lack thereof.

4.4. Strengths of This Literature Review

This review has several strengths. First, it followed the PRISMA guidelines (Page et al., 2021) for a transparent and replicable search process. Second, the data collection systematically documented the reviewed studies' characteristics, including publication information, research methods, participant demographics, data collection tools, independent variables, and typography. The data was then analyzed and summarized using a reflexive approach to thematic analysis (Braun & Clarke, 2021). Third, the reviewed studies represent a wide range of knowledge and research on typography across multiple disciplines. The studies evaluated the benefits and consequences of typography using cognitive science, psychology, vision science, and education measures and perspectives. Finally, many of the reviewed studies feature large sample sizes and include participants with different disabilities, which provides a wide representation of the population.

4.5. Limitations and Future Studies

The present review has several limitations that warrant further systematic reviews. First, it exclusively features research that evaluates Latin alphabet-based languages.

Examining how languages based on other writing systems or alphabets manage legibility and readability factors may support a better understanding of the influences on reading performance, including familiarity and its capacity to affect subjective and objective legibility, readability, and overall reading performance for people with and without disabilities. Second, research on specialist typefaces was excluded. Including studies that evaluated the effectiveness of specialist typefaces designed to address or accommodate specific disabilities might provide evidence of the efficacy of certain stylistic typeface design features; however, this was not within the scope of this literature review. Third, this literature review included strictly peer-reviewed journal articles and excluded theses and dissertations, which often contain exploratory studies that are not always published in peer-reviewed journals. Including theses and dissertations could provide novel perspectives that may enhance the discussion and interpretation of the current findings. Fourth, only research that explicitly evaluated and measured performance-based outcomes of typography was reviewed. Including research that measured other effects of typography, including but not limited to bias, decision-making, categorization, and other different perceptual outcomes, may illustrate the reach of the potential benefits and consequences of typography. Fifth, although some studies on letter width were included, this factor may not have been adequately represented in our review. Variations in letter width beyond the standard can affect legibility, particularly for readers with low vision. Sixth, the present review exclusively features research with participants aged 15 to 65. Future research with participants beyond these age groups would enhance the research in this area. Finally, this literature review employed reflexive thematic analysis (Braun & Clarke, 2021) to analyze and synthesize the data collected from the reviewed studies, however, other quantitative methods, such as meta-analysis, may provide a different perspective regarding the impact of study size, giving greater weight to studies with larger sample sizes.

The limitations of the reviewed studies provide considerations and directions for future research. First, future research on serifs could consider type classifications given that different serif classifications have considerably different appearances. The typeface design characteristics and traits inherent to different serif typeface classifications may be more influential than the presence or absence of serifs. Second, future research could also investigate the effects of familiarity on legibility, readability, and reading performance. Familiarity may be a key legibility and readability factor affecting reading performance (Slattery & Rayner, 2010) and comprehension. The most popular and familiar typefaces are also the most featured in the reviewed studies: Arial (n = 22), Times New Roman/Times (n = 18), Courier/Courier New (n = 7), and Verdana (n = 6). However, a more comprehensive range of typefaces, or more typefaces per each study, such as in Wallace et al.'s (2022) (n = 22) would provide data on less popular typefaces. Additionally, methods that include participants reading text set in unfamiliar typefaces may provide insight into the familiarization process. Third, future research could explore more natural reading conditions, practical test materials, and additional measures of reading performance beyond reading speed. Reading tasks used in typography experiments often do not reflect typical reading (Dyson, 2023a). Incorporating more natural reading conditions would strengthen ecological validity and provide more authentic data on cognitive processing. Regarding experimental materials, using materials that better reflect standard design practices would offer a realistic view of how typeface design and typographic variables influence continuous reading, extending beyond isolated word recognition. For methodological consistency within experimental research designs, future experiments comparing typefaces could normalize type by x-height and measure perceived type size by x-height in millimetres for print and by visual angle (in minutes of arc) for screen-based text. Furthermore, relying solely on reading speed as an indicator of performance may not adequately reflect accessibility. Reading speed does not capture comprehension, cognitive load, or represent everyday reading. In typical reading situations, individuals read at different speeds depending on their goals and context. For example, reading for comprehension and learning generally occurs at lower speeds (Carver, 1992). Therefore, readers are unlikely to notice or be concerned with variations in reading speed unless those differences are significant (van der Waarde & Thiessen, 2025).

Additionally, reading speed is balanced by accuracy, and there is usually a trade-off between the two (Dyson, 2023a). This relationship may be further complicated in experiments involving word recognition tasks, such as lexical decision tasks and rapid serial visual presentation (RSVP). In some cases, results may be confounded by external factors such as word frequency; less frequent words may naturally take longer to identify, posing a threat to the validity of these experiments. Further performance measures beyond reading speed, informed by cognitive psychology, education, and neuroscience, may offer better insight into reading outcomes associated with typefaces, typesetting, readers, and reading contexts. This approach may extend the valuable contributions of existing multidisciplinary research and support the translation of findings into real-world design practice. Finally, accessible typography research may benefit from additional in-depth qualitative approaches where participants' experiences and perspectives are examined and analyzed in detail. This qualitative information may provide insights and could offer details on the reading experiences of persons with and without disabilities.

4.6. Implications for Practice and Policy

Lastly, additional recommendations for practice and policy considerations can be made as a result of this literature review. Below are some recommendations that contextualize the appropriate use of serifs, different typefaces, type styles, letter case, and make suggestions for type size, spacing, and line length. Hopefully, they may provide guidance in creating typography that is visually interesting, meaningful, and accessible in practice and for policymakers to consider.

Serifs. The research indicates that serifs are not a significant legibility factor (Arditi & Cho, 2005; Bernard et al., 2003; Minakata & Beier, 2022; Perea, 2013; Sheedy et al., 2005; Soleimani & Mohammadi, 2012). Serif typefaces may be used appropriately for aesthetic and stylistic value. When selecting serif typefaces for use, consider the intended audience and the appropriateness of letterforms including stroke contrast.

Typeface. In some of the reviewed studies, other typefaces match or outperform Arial in legibility measures (Sieghart, 2023; Wallace et al., 2022). The ubiquity of Arial may influence its perceived subjective legibility. Typefaces other than Arial may be used appropriately; however, display or decorative typefaces should be used moderately (CNIB, 2020; EBU, 2016) and never at small type sizes. When selecting typefaces for use, consider the intended audience and the appropriateness of letterforms including stroke contrast, letter width, and the embellishment of typefaces.

Type style. Bold and italic type styles may moderately reduce reading speed (Dyson & Beier, 2016) but can add hierarchy and organization (Lupton, 2010b), which may provide greater semantic meaning and contribute to increased readability. Additionally, people with low vision often prefer bold type styles for reading (Bernard et al., 2013). Bold and italic type styles may be used for differentiation and to add visual interest, tone, and hierarchy. When selecting type styles for use, consider the intended audience and the appropriateness of stroke contrast and stroke width (weight). Additionally, bold type styles may be helpful for other design-based uses to increase visibility and readability (Bringhurst, 2004).

Letter case. Uppercase letters are typically larger than lowercase letters, and at smaller type sizes, may be more readable for people with low vision (Arditi & Cho, 2007). Many studies have reported that reading text in all uppercase slows reading speed compared to lowercase or sentence case text, and this may be due to greater familiarity with reading lowercase or sentence case text (Dyson, 2023b). The long-standing concern that uppercase letters obscure word shapes, as noted in the Government of Canada (2022) guidelines, persists. However, research evidence does not support the word-shape model of reading (Larson, 2004). Limiting the use of uppercase text may negatively affect how agencies, organizations, and companies present their identity and branding, particularly in advertising and promotional campaign materials. Text set in all uppercase letters may be used for moderate amounts of content to differentiate and add visual interest, emphasis, and hierarchy.

Type size. In regards to type size, bigger is only sometimes better. There is no benefit to exceeding optimal type sizes (Sieghart, 2023). Select a type size that accommodates the appropriate white space within the format of the material. Consider the intended audience and their individual differences and disabilities, larger type sizes may benefit people with low vision.

Spacing. Insufficient letter spacing (tracking) (Beier & Oderkerk, 2019; Liu & Arditi, 2001) or line spacing (leading) (Dobres et al., 2018) can cause visual crowding and significantly reduce readability. Use letter spacing close to normal settings and avoid negative (less than normal) letter spacing. Line spacing in points should be at least the type size in points plus 20 to 30%. In many page layout programs, the default line spacing is set to 20% more than the type size. Be cautious of using less than normal letter or line spacing for copy fitting or to compensate for larger text sizes.

Line length. Line lengths can influence the reader's performance and experience. Multi-column layouts can shorten line lengths and may benefit reading for all readers, but may be especially beneficial for people with disabilities such as dyslexia (Schneps et al., 2013).

These recommendations may guide design practice and encourage consideration of the design context for the appropriate use of serifs, different typefaces, type styles, and uppercase letters while also providing suggestions on type size, spacing, and line length. The results of this literature review may interest policymakers in government, businesses, non-profits, and broader public sector organizations who may consider these recommendations in future versions of their accessible typography guidelines.

4.7. Conclusion

As the research has demonstrated, there is no one-size-fits-all solution that optimizes typography for everyone in every situation. The body of research on accessible typography has inconsistent and sometimes contradictory results which may be due to differences in readers, typefaces, and research methodologies and methods. However, the opposing results from one study may not disprove the findings of another study. Instead, these contradictions reflect the complexity and nuance involved in balancing the design, individual, and contextual factors that influence the readability and functionality of typography. This literature review demonstrates the need for accessible typography guidelines that are practical, grounded in evolving research, and acknowledge that there are different types of reading that serve diverse purposes. Accessibility guidelines must also consider the artistic and emotional aspects of people, and not only focus strictly on their ability or lack thereof. Accessibility is an essential initiative towards social justice and benefits everyone, especially people with disabilities.

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Appendix A: Empirical Studies on Legibility and Readability Using Quantitative Methods (*n* = 30)

#	Study	Participants	Research objective	Research measurements	Key findings/results
1	Al-Samarraie et al., (2017)	• 23 (*M* = 32 y/o) • Penang, Malaysia	Evaluate the reading effectiveness of text online in single or multi-column layouts.	1. Eye movements	1. Three-column layout performed best for repeated reading. 2. One column layout performed best for non-repeated reading. 3. Repeated reading improved performance regardless of layout.
2	Arditi & Cho, (2005)	• 6 (4 normal vision, 2 low vision) • New York City	Investigate the influence of serifs on legibility and readability.	1. Type size threshold 2. Reading speed	1. Serifs did not affect reading speed for any participants. 2. Serifs slightly improved legibility. 3. There was no legibility effect between typefaces that were the same but had or lacked serifs for those with normal, corrected-to-normal vision, or vision loss.

#	Study	Participants	Research objective	Research measurements	Key findings/results
3	Arditi & Cho, (2007)	• 9 (5 normal vision, 4 low vision) New York City	Investigate the influence of serifs on legibility and readability.	1. Type size threshold 2. Reading speed	1. Uppercase text had the lowest size threshold. 2. Uppercase text was read the fastest at smaller text sizes, particularly by individuals with vision loss; however, at larger sizes, reading performance was similar across all case conditions. 3. Results indicated that size is essential to legibility, and uppercase may be more readable at smaller text sizes, especially for people with low vision.
4	Beier & Oderkerk, (2019)	• 42 (22 under 50, 20 over 50) • (*M* = 47.67 y/o) • Copenhagen, Denmark	Test the legibility of Gill Sans Light, KBH Display Regular, and KBH Text Regular with younger and older adults.	1. Reading speed 2. Reading acuity 3. Critical print size	1. KBH Display and Text was more readable at smaller sizes for both age groups. 2. Gill Sans improved reading speed for the older group at larger sizes but impaired it at smaller sizes. 3. Results suggested there is no universally most legible font; legibility depends on the context.
5	Beier & Oderkerk, (2021)	• 24 (*M* = 25.9 y/o) • Copenhagen, Denmark	Investigate the impact of stroke contrast of bold fonts on letter recognition.	1. Reading accuracy	1. Bold fonts with high stroke contrast impaired letter recognition, low or medium stroke contrast did not. 2. Results showed that stroke contrast affects reading.
6	Bernard et al., (2013)	• 6 (17–24 y/o) • Berkeley, California	Investigate the effects of letter-stroke boldness on reading speed in central and peripheral vision.	1. Reading speed	1. Stroke weight only affected reading in central vision once the weight becomes very thin or thick. 2. Reading in the periphery was almost equal for all conditions. 3. Some people with vision loss prefer bolder fonts, these results suggested that preferences may not be connected to performance.
7	Diemand-Yauman et al., (2011)	• Expt. 1: 28 (18–40 y/o) • Princeton, New Jersey • Expt. 2: 222 (15–18 y/o) • Chesterland, Ohio	Test if disfluency, in the form of typography, leads to deeper processing and improves retention.	1. Test scores	1. In expt. 1 and 2, the disfluent conditions yielded higher test scores, and the students outperformed the fluent conditions. 2. Results indicated that small disfluency interventions may significantly impact student performance and retention.
8	Dobres et al., (2018)	• 30 (*M* = 53 y/o) • Cambridge, Massachusetts	Examine the effects of visual crowding, text size, and positional uncertainty on text legibility at a glance.	1. Reading accuracy 2. Reading time	1. Smaller type size, smaller leading, and positional uncertainty had an adverse effect on readability. 2. Additional leading did not improve the readability of smaller text. 3. There was a weak connection of age and legibility thresholds. 4. Results suggested that visual crowding significantly influences readability.

#	Study	Participants	Research objective	Research measurements	Key findings/results
9	Dyson & Beier, (2016)	• 12 • Reading, UK • Copenhagen, Denmark	Determine what type of typographic variation (weight, width, stroke contrast, and italic) and the limits of the variation before compromising legibility.	1. Response time 2. Reading accuracy	1. Bold or expanded type impaired legibility. 2. Italics (used for emphasis) did not compromise legibility. 3. Bold was found to be more appropriate than italic for headings. 4. Results supported using typographic variations to emphasize text effectively.
10	Dyson & Haselgrove, (2001)	• Fast Reading: 12 (18–24 y/o), 6 (25–44 y/o) • Normal Reading: 14 (18–24 y/o), 4 (25–44 y/o) • Reading, UK	Evaluate how line length affects reading on screen at normal and fast speeds.	1. Test scores 2. Reading time	1. A medium line length of 55 characters per line yielded the best performance at normal and fast reading speeds and read faster than shorter line lengths. 2. There may be a more optimal length than 55 characters per line, as the study tested a broad range of line lengths.
11	French et al., (2013)	• 275 (13–16 y/o) • Bristol, UK	Explore if disfluency is appropriate for all students or if it has an adverse effect on students with less motivation or ability.	1. Test scores	1. The disfluent font conditions produced higher test scores. 2. Dyslexic students experienced a more significant increase in test scores than non-dyslexic students. 3. Results found that disfluency may be beneficial to learning and memory recall.
12	Gasser et al., (2005)	• 149 (*M* = 18.98 y/o) • Cedar Falls, Iowa	Investigate the influence of serifs (or lack thereof) and proportional or monospace widths on memory recall.	1. Test scores	1. Serif typefaces significantly improved memory recall and yielded higher test scores. 2. Character width and spacing did not have an effect. 3. Results found serifs beneficial; however, the increase in performance could be influenced by familiarity.
13	Geller et al., (2018)	• Expt. 1: 30 • Expt. 2 and 3: 36 • Ames, Iowa	Examine how perceptually disfluent typography in the form of cursive handwriting affects memory.	1. Test scores	1. Easy-to-read and hard-to-read cursive performed better for memory recall than type-print; easy-to-read cursive was statistically the best performing. 2. Results found disfluency beneficial but indicated that the level of disfluency and how it is enacted matters.
14	Kanonidou et al., (2014)	• Amblyopes Group: 15 (*M* = 44.6 y/o) • Control Group: 18 (*M* = 42 y/o) • Leicester, UK	Investigate the effects of font size on reading speed and eye movements in people with strabismic amblyopia (distorted spatial perception).	1. Eye movements 2. Reading speed	1. Participants with strabismic amblyopia read slower than those without. 2. Reading speeds were average for strabismic amblyopes in the larger text conditions; reading was impaired as the font size decreased.

#	Study	Participants	Research objective	Research measurements	Key findings/results
15	Krivec et al., (2020)	• 82 (16–36 y/o) • 26 dyslexic • Ljubljana, Slovenia	Assess if typographic variables that are self-set by participants improve readability.	1. Reading speed	1. No significant impact of self-set or pre-set text. 2. Results indicated that preferences are not performance-based and typography informed by research may be optimal for most.
16	Minakata & Beier, (2021)	• 25 (18–35 y/o) • Copenhagen, Denmark	Evaluate the effect of letter width on eye movement while reading.	1. Eye movements 2. Reading speed	1. Ultra condensed fonts resulted in longer fixations. 2. Condensed, roman (regular), and extended fonts had comparable reading and processing times. 3. There was no significant effect of letter width on reading speed. 4. Results showed that readers can adapt their reading to accommodate different levels of legibility.
17	Minakata & Beier, (2022)	• Expt. 1: 33 (*M* = 23 y/o) • Expt. 2: 24 (*M* = 26 y/o) • Copenhagen, Denmark	Explore the impacts of serifs (or lack thereof) and stroke contrast on word identification.	1. Type size threshold 2. Reading accuracy 3. Reading speed	1. Typefaces with low-stroke contrast could be read at smaller font sizes than fonts with high-stroke contrast. 2. Sans-serif typefaces with a low-stroke contrast were read at smaller font sizes, and the opposite was observed for serif typefaces. 3. There was no effect of serifs on word recognition.
18	Minakata et al., (2023)	• 19 low vision (*M* = 32 y/o) • Copenhagen, Denmark	Compare the effects of serifs (or lack thereof) and stroke contrast on font size thresholds and reading in those with and without low vision.	1. Reading accuracy 2. Reading speed	1. Low stroke contrast words were read at smaller sizes in serif fonts. 2. For low vision readers, serif fonts with low stroke contrast and sans serif with high stroke contrast performed best; the opposite was true for ‘normal’ vision readers. 3. Results indicated that typographic variables could interact and produce unexpected results.
19	Moret-Tatay & Perea, (2011)	• 20 • Valencia, Spain	Examine the effects of serif on lexical access.	1. Reading accuracy	1. Sans serif fonts outperformed serif fonts. 2. Removing serifs slightly increased letter spacing, which may have improved reading efficiency. 3. Increased letter spacing reduced visual crowding and improved word recognition.
20	Perea, (2013)	• 24 • Valencia, Spain	Examine the effects of serifs (or lack thereof) on normal reading.	1. Eye movements	1. Serif or sans serif had no significant effect on eye movement measures. 2. Recommendations to use serif typefaces may be based on historical or aesthetic preferences, not performance.
21	Perea et al., (2011)	• Expt. 1: 38 • Expt. 2: 16 • Valencia, Spain	Investigate the effects of letter spacing on word recognition.	1. Reading accuracy 2. Reading speed	1. Letter spacing played an important role in word identification. 2. Results found that word recognition was faster with words that had a moderate increase in letter spacing.

#	Study	Participants	Research objective	Research measurements	Key findings/results
22	Pušnik et al., (2016a)	• 50 (*M* = 25.3 y/o) • Ljubljana, Slovenia	Examine the best options for typeface, letter case, and position of on-screen text for efficient reading.	1. Eye movements 2. Reading speed	1. Georgia (serif) was the best-performing typeface. 2. Uppercase was the best-performing letter case. 3. Upper regions on the screen were the best positions. 4. Results found serifs beneficial and preferred uppercase over sentence case or lowercase letters for legibility.
23	Pušnik et al., (2016b)	• 50 (*M* = 24.3 y/o) • Ljubljana, Slovenia	Determine the difference in word recognition for typeface, letter case, type size, and position of on-screen text for efficient reading.	1. Eye movements 2. Reading speed	1. Calibri (sans serif) was the best-performing typeface, uppercase was better performing than lowercase. 2. Swiss 721 (sans serif) was the worst-performing typeface regardless of letter case. 3. Trebuchet, Verdana, Georgia had comparable performance regardless of letter case.
24	Risko et al., (2011)	• Expt. 1: 56 • Expt. 2: 64 • Tempe, Arizona	Investigate the impairments of increased letter spacing on cognitive processing.	1. Reading accuracy 2. Reading speed	1. Increased letter spacing impaired reading. Words and non-words were equally affected. 2. Results indicated that increased spacing encourages some form of serial processing.
25	Sawyer et al., (2020)	• 73 (*M* = 55 y/o) • Orlando, Florida	Compare the differences in glance legibility of eight sans serif typefaces that are commonly used in interface design.	1. Reading speed	1. Frutiger performed the best, and Gill Sans performed the worst. 2. Generally, typefaces with more open shapes and contours performed better than those with closed ones.
26	Schneps et al., (2013)	• 27 Dyslexic high school students • Cambridge, Massachusetts	Investigate if reading in shorter line lengths, specifically on small handheld devices, is beneficial for readers with dyslexia.	1. Eye movements	1. The smaller device (iPod) with shorter line lengths performed better than the larger format (iPad). 2. Normal letter spacing was preferred over expanded. 3. Results illustrated that minor line length and spacing adjustments can significantly impact reading.
27	Sheedy et al., (2005)	• 115 (18–35 y/o except expt. 4, age was not disclosed) • Expt. 1: 30 • Expt. 2: 25 • Expt. 3: 30 • Expt. 4: 30 • Columbus, Ohio	Identify and measure the typographic parameters that most affect a typeface's legibility on-screen.	1. Type size threshold 2. Visual acuity	1. Capital letters were more legible than lowercase words. 2. Bold was beneficial for capital letters and words; italic had an adverse effect. 3. Lowercase letters were more legible than words. 4. Legibility increased with font size up to 9 px./10 pt. which was found to be optimal. 5. Font size, font type, stroke width all significantly impacted legibility. However, serifs may not be a significant factor.

#	Study	Participants	Research objective	Research measurements	Key findings/results
28	Slattery & Rayner, (2010)	• Expt. 1:18 • Amherst, Massachusetts • Expt. 2: 72 • La Jolla, California	Examine how the legibility of typefaces and font smoothing technology influences eye movements while reading.	1. Eye movements 2. Reading speed 3. Test score	1. There was no effect of typeface on comprehension. 2. Times New Roman was the best-performing typeface, and ClearType was the best-performing format. 3. Low-frequency words were slower reading. 4. Results indicated that familiarity may influence legibility.
29	Slattery & Rayner, (2013)	• Expt. 1: 32 • Amherst, Massachusetts • Expt. 2: 64 • La Jolla, California	Explore the influence of intraword and interword spacing on reading.	1. Eye movements 2. Reading speed 3. Test score	1. Cambria, designed for digital display, consistently outperformed Times New Roman. 2. Words with decreased letter spacing but increased word spacing performed best. 3. Results showed increased word spacing was beneficial, with no negative effects from decreased letter spacing.
30	Soleimani & Mohammadi, (2012)	• 120 (16–20 y/o) • Urmia, Iran	Investigate the effects of font type, font size, and line spacing on reading speed, comprehension, and memory recall.	1. Reading speed 2. Test score	1. Font size impacted reading speed; 12 pt was read fastest but did not impact comprehension. 2. No effect of font style or line spacing was found on reading speed or comprehension. 3. None of the typographic variables affected memory.

Appendix B: Empirical Studies on Legibility and Readability Using Both Quantitative and Qualitative Methods ($N = 12$)

#	Study	Participants	Research objective	Research measurements	Key findings/results
1	Banerjee et al., (2011)	• 40 ($M = 27.5$ y/o) • Delhi, India	Evaluate the effects of font type and size on reading on-screen.	1. Serif or sans serif. 2. Typeface 3. Type size	1. Serifs lead to faster reading times. 14 pt. Courier was the best performing, with 14 pt. Arial trailing closely. 2. Mental workload was best for 14 pt. Verdana with 14 pt. Courier and 14 pt Arial trailing closely. 3. Results indicated that serifs enable faster reading, 14 pt is ideal for on-screen reading, and sans serif fonts may reduce mental workload and were preferred.
2	Beier & Larson, (2013)	• 60 ($M = 28$ y/o) • London, UK	Explore what contributes to familiarity–exposure or common letterforms and how familiarity affects readers' performance and preferences of typefaces.	1. Reading speed 2. Questionnaire	1. Although the uncommon letterforms did not affect reading performance, readers did not like them. 2. Results indicated that the minimal change in letter structures may be due to subjective/aesthetic-based factors rather than performance-based concerns.

#	Study	Participants	Research objective	Research measurements	Key findings/results
3	Bernard et al., (2003)	• 35 (*M* = 25 y/o) • Albuquerque, New Mexico	Evaluate the relationship between typeface, size, and format on-screen. Specifically, objective and subjective differences between serif (Times) or sans serif (Arial), in 10 and 12 pt size, on-screen in dot matrix or anti-aliased formats.	1. Reading speed 2. Reading accuracy 3. Questionnaire	1. There were no significant differences in objective readability (reading accuracy and speed). 2. There was a significant effect of typeface, size, and format on subjective readability; sans serif and larger size were perceived as more readable. 3. Arial, 10 pt anti-aliased was the slowest reading, 4. Arial, 12 pt dot matrix was the most preferred. 5. Results showed the influence of perceived readability on subjective typeface preference.
4	Hojjati & Muniandy, (2014)	• 30 • Penang, Malaysia	Explore the effect of serif or sans serif typefaces and line spacing on reading speed and comprehension.	1. Test scores 2. Reading speed 3. Questionnaire	1. Sans serif outperformed the serif in all conditions. 2. Double line spaced sans serif had the best performance and highest participant preference.
5	Ling & van Schaik, (2006)	• Expt. 1: 72 (44 under 25, 28 26–50 y/o) • Expt. 2: 99 (*M* = 24 y/o) • Keele, UK	Investigate the effects of font type and line length on reading performance.	1. Reading accuracy 2. Task completion time 3. Questionnaire	1. In expt. 1, typeface did not impact search time or accuracy, and longer line lengths had faster searches with reduced accuracy. 2. In expt. 2, there was no significant effect of typeface or line length. 3. Participants preferred shorter line lengths and Arial.
6	Lonsdale, (2007)	• Expt. 1: 32 (*M* = 26.6 y/o) • Expt. 2: 32 (*M* = 25.6 y/o) • Expt. 3: 32 (*M* = 29.8 y/o) • Leeds, UK	Investigate if typographic and layout variables influence examination performance and outcomes.	1. Test scores 2. Questionnaire	1. Typographic layout affected speed, accuracy, and overall performance of participants' test results. 2. Participants preferred the increased legibility conditions. 3. Results showed that typography can significantly impact cognition and test performance.
7	Lonsdale, (2014)	• 32 (*M* = 30.9 y/o) • Leeds, UK	Examine if typographic variables affect examination performance for multiple-choice, location, and comprehension questions.	1. Test scores 2. Questionnaire	1. Typographic layout affected speed, accuracy, and overall performance of participants' test results. 2. Participants preferred the increased legibility conditions. 3. Results indicated that typography can significantly impact cognition and test performance.
8	Lonsdale, (2016)	• 30 (*M* = 29.3 y/o) • Reading, UK	Investigate if typographic and layout variables influence student performance when given a reading task without a time limit.	1. Test scores 2. Questionnaire	1. Typographic layout affected speed, accuracy, and overall performance of participants' test results. 2. Participants preferred the increased legibility conditions. 3. Results indicated that typography can significantly impact cognition and test performance.

#	Study	Participants	Research objective	Research measurements	Key findings/results
9	Lonsdale et al., (2006)	• 30 (*M* = 25.8 y/o) • Reading, UK	Investigate if typographic and layout variables influence examination performance and outcomes.	1. Test scores 2. Questionnaire	1. Typographic layout affected speed, accuracy, and overall performance of participants' test results. 2. Participants preferred the increased legibility conditions. 3. Results indicated that typography can significantly impact cognition and test performance.
10	Sieghart, (2023)	• 145 people with undisclosed disabilities • Hasselt, Belgium	Evaluate the effectiveness of two common east-to-read language (readability) recommendations of a sans serif typeface, such as Arial and 14 pt type size.	1. Reading speed 2. Questionnaire	1. 51.1% read serif typefaces the fastest. Arial was the worst performing typeface. 2. Serifs or lack thereof are not a significant legibility factor. 3. 12 or 12.5 pt was found to be large enough by 93.7% of participants. 4. Subjectively preferred typefaces were not the best performing. 5. Familiarity did not moderate reading speed; unfamiliar fonts were read faster than Arial. 6. Results indicated that the common recommendation of 14 pt Arial may need to be revised. There is no such thing as a single correct font or font size.
11	Ukonu et al., (2021)	• 315 • Nsukka, Nigeria	Examine preference, reading speed, and error detection rates for Times New Roman and Calibri typefaces in print and on screen.	1. Reading speed 2. Questionnaire	1. The average reading speed was higher for Times New Roman. 2. Times New Roman was preferred for print and Calibri for screen. 3. Preference for Calibri may be informed by familiarity, whereas preferences for Times New Roman may be based on the perception it is better for school assignments.
12	Wallace et al., (2022)	• 352 (*M* = 33 y/o) • Providence, Rhode Island	Explore the effects of font choice on reading speed and comprehension (and explore if there is a connection between font preference and performance).	1. Test scores 2. Reading speed 3. Questionnaire	1. Participants read 14% faster in their fastest reading font over their preferred font. Participants read 35% faster in their fastest font than their slowest font. 2. Familiarity was not a factor. 3. Results indicated that no single font or font size improves reading for everyone, reinforcing the need for individuation.

Appendix C: Reviewed Studies Data Collection Tools (*N* = 42)

Research measures (No. of studies)	Studies
Eye movements (*n* = 9)	Al-Samarraie et al. (2017); Kanonidou et al., (2014); Minakata & Beier, (2021); Perea, (2013); Pušnik et al., (2016a); Pušnik et al., (2016b); Schneps et al., (2013); Slattery & Rayner, (2010); Slattery & Rayner, (2013)
Questionnaires (*n* = 12)	Banerjee et al., (2011); Beier & Larson, (2013); Bernard et al., (2003); Hojjati & Muniandy, (2014); Ling & van Schaik, (2006); Lonsdale, (2007); Lonsdale, (2014); Lonsdale, (2016); Lonsdale et al., (2006); Sieghart, (2023); Ukonu et al., (2021); Wallace et al., (2022)

Research measures (No. of studies)	**Studies**
Reading accuracy (*n* = 11)	Banerjee et al., (2011); Beier & Oderkerk, (2021); Bernard et al., (2003); Dobres et al., (2018); Dyson & Beier, (2016); Ling & van Schaik, (2006); Minakata & Beier, (2022); Minakata et al., (2023); Moret-Tatay & Perea, (2011); Perea et al., (2011); Risko et al., (2011)
Reading acuity (*n* = 1)	Beier & Oderkerk, (2019)
Reading speed (*n* = 24)	Arditi & Cho, (2005); Arditi & Cho, (2007); Banerjee et al., (2011); Beier & Larson, (2013); Beier & Oderkerk, (2019); Bernard et al., (2013); Bernard et al., (2003); Hojjati & Muniandy, (2014); Kanonidou et al., (2014); Krivec et al., (20(20); Minakata & Beier, (2021); Minakata & Beier, (2022); Minakata et al., (2023); Perea et al., (2011); Pušnik et al., (2016a); Pušnik et al., (2016b); Risko et al., (2011); Sawyer et al., (20(20); Sieghart, (2023); Slattery & Rayner, (2010); Slattery & Rayner, (2013); Soleimani & Mohammadi, (2012); Ukonu et al., (2021); Wallace et al., (2022)
Reading time (*n* = 2)	Dobres et al., (2018); Dyson & Haselgrove, (2001)
Task completion time (*n* = 1)	Ling & van Schaik, (2006)
Test scores (*n* = 14)	Diemand-Yauman et al., (2011); Dyson & Haselgrove, (2001); French et al., (2013); Gasser et al., (2005); Geller et al., (2018); Hojjati & Muniandy, (2014); Lonsdale, (2007); Lonsdale, (2014); Lonsdale, (2016); Lonsdale et al., (2006); Slattery & Rayner, (2010); Slattery & Rayner, (2013); Soleimani & Mohammadi, (2012); Wallace et al., (2022)
Type size threshold (*n* = 4)	Arditi & Cho, (2005); Arditi & Cho, (2007); Minakata & Beier, (2022); Sheedy et al., (2005)

Appendix D: Reviewed Studies Typeface Design Variables (*N* = 33)

Study	**Letter structure**	**Letter width**	**Serif/sans**	**Stroke contrast**	**Stroke width**	**Typeface**	**Type style**
1. Arditi & Cho (2005)			•			•	
2. Banerjee et al., (2011)			•			•	
3. Beier & Larson, (2013)	•						
4. Beier & Oderkerk, (2019)	•					•	
5. Beier & Oderkerk, (2021)				•	•	•	
6. Bernard et al., (2013)					•	•	
7. Bernard et al., (2003)			•			•	
8. Diemand-Yauman et al., (2011)			•			•	
9. Dyson & Beier, (2016)		•		•	•		
10. French et al., (2013)						•	
11. Gasser et al., (2005)			•			•	
12. Geller et al., (2018)	•						
13. Hojjati & Muniandy, (2014)			•			•	
14. Ling & van Schaik, (2006)			•			•	
15. Lonsdale, (2007)						•	
16. Lonsdale, (2014)						•	
17. Lonsdale, (2016)						•	
18. Lonsdale et al., (2006)						•	
19. Minakata & Beier, (2021)		•					
20. Minakata & Beier, (2022)			•	•			
21. Minakata et al., (2023)			•			•	

Study	Letter structure	Letter width	Serif/sans	Stroke contrast	Stroke width	Typeface	Type style
22. Moret-Tatay & Perea, (2011)			•			•	
23. Perea, (2013)			•			•	
24. Pušnik et al., (2016a)			•			•	
25. Pušnik et al., (2016b)			•			•	
26. Sawyer et al., (2020)						•	
27. Sheedy et al., (2005)			•			•	•
28. Sieghart, (2023)			•			•	
29. Slattery & Rayner, (2010)			•			•	
30. Slattery & Rayner, (2013)			•			•	
31. Soleimani & Mohammadi, (2012)			•			•	
32. Ukonu et al., (2021)			•			•	
33. Wallace et al., (2022)			•			•	
Total	3	2	20	3	3	28	1

Appendix E: Reviewed Studies Typographic Variables (*N* = 29)

Study	Colour	Columns	Letter case	Letter spacing	Line length	Line spacing	Paragraph spacing	Text alignment	Type size	Word spacing
1. Al-Samarraie et al. (2017)		•								
2. Arditi & Cho, (2005)									•	
3. Arditi & Cho, (2007)			•						•	
4. Banerjee et al., (2011)									•	
5. Beier & Oderkerk, (2019)									•	
6. Bernard et al., (2003)									•	
7. Diemand-Yauman et al., (2011)	•									
8. Dobres et al., (2018)						•				
9. Dyson & Haselgrove, (2001)					•					
10. French et al., (2013)	•									
11. Hojjati & Muniandy, (2014)						•				
12. Kanonidou et al., (2014)									•	
13. Krivec et al., (2020)					•	•		•		

Study	Colour	Columns	Letter case	Letter spacing	Line length	Line spacing	Paragraph spacing	Text alignment	Type size	Word spacing
14. Ling & van Schaik, (2006)					•				•	
15. Lonsdale, (2007)					•	•	•		•	
16. Lonsdale, (2014)					•	•	•		•	
17. Lonsdale, (2016)					•	•	•		•	
18. Lonsdale et al., (2006)					•	•	•		•	
19. Minakata et al., (2023)									•	
20. Perea et al., (2011)				•						
21. Pušnik et al., (2016a)			•							
22. Pušnik et al., (2016b)			•						•	
23. Risko et al., (2011)				•						
24. Schneps et al., (2013)				•	•					
25. Sheedy et al., (2005)			•	•					•	
26. Sieghart, (2023)									•	
27. Slattery & Rayner, (2010)									•	
28. Slattery & Rayner, (2013)				•						•
29. Soleimani & Mohammadi, (2012)					•				•	
Total	2	1	4	5	9	7	4	1	17	1

Appendix F: Reviewed Studies Typeface Distribution by Study (*N* = 42)

#	Study/typefaces per study (*n*)	Typefaces
1	Al-Samarraie et al., 2017 (*n* = 1)	Times New Roman
2	Arditi & Cho, 2005 (*n* = 9)	Custom fonts
3	Arditi & Cho, 2007 (*n* = 1)	Arial
4	Banerjee et al., 2011 (*n* = 6)	Arial, Courier New, Georgia, Tahoma, Times New Roman, Verdana,
5	Beier & Larson, 2013 (*n* = 6)	Custom fonts, Helvetica, Times New Roman
6	Beier & Oderkerk, 2019 (*n* = 3)	Gill Sans Light, KBH Display Regular, KBH Text Regular
7	Beier & Oderkerk, 2021 (*n* = 3)	Custom fonts
8	Bernard et al., 2013 (*n* = 1)	Courier
9	Bernard et al., 2003 (*n* = 2)	Arial, Times New Roman

#	Study/typefaces per study (*n*)	Typefaces
10	Diemand-Yauman et al., 2011 (*n* = 6)	Arial, Bodoni MT, Comic Sans, Comic Sans Italicized, Haettenschweiler, Monotype Corsiva
11	Dobres et al., 2018 (*n* = 2)	Frutiger, Georgia
12	Dyson & Beier, 2016 (*n* = 7)	Custom fonts
13	Dyson & Haselgrove, 2001 (*n* = 6)	Arial
14	French et al., 2013 (*n* = 2)	Arial, Monotype Corsiva
15	Gasser et al., 2005 (*n* = 2)	Courier, Helvetica, Monaco, Palatino
16	Geller et al., 2018 (*n* = 3)	Custom font, Unspecified
17	Hojjati & Muniandy, 2014 (*n* = 2)	Times New Roman, Verdana
18	Kanonidou et al., 2014 (*n* = 1)	Courier New
19	Krivec et al., 2020 (*n* = 7)	Amasis, Bembo, Demos, Neue Frutiger, Neuzeit Office, Open Sans, Verdana
20	Ling & van Schaik, 2006 (*n* = 2)	Arial, Times New Roman
21	Lonsdale, 2007 (*n* = 3)	Times New Roman, Times New Roman Bold, Times New Roman Italic
22	Lonsdale, 2014 (*n* = 3)	DIN Bold, DIN Regular, Times New Roman
23	Lonsdale, 2016 (*n* = 3)	DIN Bold, DIN Regular, Times New Roman
24	Lonsdale et al., 2006 (*n* = 3)	DIN Bold, DIN Regular, Times New Roman
25	Minakata & Beier, 2021 (*n* = 4)	Univers Condensed, Univers Extended, Univers Regular, Univers Ultra Condensed
26	Minakata & Beier, 2022 (*n* = 4)	Custom fonts
27	Minakata et al., 2023 (*n* = 2)	Custom fonts
28	Moret-Tatay & Perea, 2011 (*n* = 2)	Lucida Bright, Lucida Sans
29	Perea, 2013 (*n* = 2)	Lucida, Lucida Sans
30	Perea et al., 2011 (*n* = 1)	Times New Roman
31	Pušnik et al., 2016a (*n* = 5)	Calibri, Georgia, Swiss 721, Trebuchet, Verdana
32	Pušnik et al., 2016b (*n* = 5)	Calibri, Georgia, Swiss 721, Trebuchet, Verdana
33	Risko et al., 2011 (*n* = 1)	Unspecified
34	Sawyer et al., 2020 (*n* = 8)	Avenir LT Pro 55 Roman, DIN Next LT Pro Regular, Eurostile Regular, Frutiger Neue LT Pro Regular, Gill Sans MT Regular, Meta Office Pro Book, Speak Office Pro Book, Univers Next Pro Regular
35	Schneps et al., 2013 (*n* = 1)	Georgia
36	Sheedy et al., 2005 (*n* = 4)	Arial, Georgia, Times New Roman, Verdana
37	Sieghart, 2023 (*n* = 5)	Arial, Thesis The Serif, Thesis TheAntiqua B, Thesis TheMix, Thesis TheSans
38	Slattery & Rayner, 2010 (*n* = 5)	Andale Mono, Consolas, Harrington, Script MT Bold, Times New Roman
39	Slattery & Rayner, 2013 (*n* = 4)	Cambria, Consolas, Georgia, Times New Roman
40	Soleimani & Mohammadi, 2012 (*n* = 2)	Arial, Bookman
41	Ukonu et al., 2021 (*n* = 2)	Calibri, Times New Roman
42	Wallace et al., 2022 (*n* = 16)	Arial, Avant Garde, Avenir Next, Calibri, EB Garamond, Franklin Gothic, Helvetica, Lato, Montserrat, Noto Sans, Open Sans, Oswald, Poytner Gothic, Roboto, Times, Utopia

Appendix G: Reviewed Studies Typefact Distribution by Typeface (*N* = 52)

#	Typeface/number of studies (*n*)	Studies
1	Amasis (*n* = 1)	Krivec et al., 2020
2	Andale Mono (*n* = 1)	Slattery & Rayner, 2010
3	Arial (*n* = 11)	Arditi & Cho, 2007; Banerjee et al., 2011; Bernard et al., 2003; Diemand-Yauman et al., 2011; Dyson & Haselgrove, 2001; French et al., 2013; Ling & van Schaik, 2006; Sheedy et al., 2005; Sieghart, 2023; Soleimani & Mohammadi, 2012; Wallace et al., 2022
4	Avante Garde (*n* = 1)	Wallace et al., 2022
5	Avenir/Avenir Next (*n* = 2)	Sawyer et al., 2020; Wallace et al., 2022
6	Bembo (*n* = 1)	Krivec et al., 2020

#	Typeface/number of studies (*n*)	Studies
7	Bookman (*n* = 1)	Soleimani & Mohammadi, 2012
8	Bodoni MT (*n* = 1)	Diemand-Yauman et al., 2011
9	Calibri (*n* = 4)	Pušnik et al., 2016a; Pušnik et al., 2016b; Ukonu et al., 2021; Wallace et al., 2022
10	Cambria (*n* = 1)	Slattery & Rayner, 2013
11	Comic Sans (*n* = 1)	Diemand-Yauman et al., 2011
12	Consolas (*n* = 2)	Slattery & Rayner, 2010; Slattery & Rayner, 2013
13	Courier/Courier New (*n* = 4)	Banerjee et al., 2011; Bernard et al., 2013; Gasser et al., 2005; Kanonidou et al., 2014
14	Custom Typeface (*n* = 7)	Arditi & Cho, 2005; Beier & Larson, 2013; Beier & Oderkerk, 2021; Dyson & Beier, 2016; Geller et al., 2018; Minakata & Beier, 2022; Minakata et al., 2023
15	Demos (*n* = 1)	Krivec et al., 2020
16	DIN /DIN Next (*n* = 4)	Lonsdale, 2014; Lonsdale, 2016; Lonsdale et al., 2006; Sawyer et al., 2020
17	Eurostile (*n* = 1)	Sawyer et al., 2020
18	Franklin Gothic (*n* = 1)	Wallace et al., 2022
19	Frutiger/Frutiger Neue (*n* = 3)	Dobres et al., 2018; Krivec et al., 2020; Sawyer et al., 2020
20	Garamond/EB Garamond (*n* = 1)	Wallace et al., 2022
21	Georgia (*n* = 7)	Banerjee et al., 2011; Dobres et al., 2018; Pušnik et al., 2016a; Pušnik et al., 2016b; Schneps et al., 2013; Sheedy et al., 2005; Slattery & Rayner, 2013
22	Gill Sans/Gill Sans MT (*n* = 2)	Beier & Oderkerk, 2019; Sawyer et al., 2020
23	Haettenschweiler (*n* = 1)	Diemand-Yauman et al., 2011
24	Harrington (*n* = 1)	Slattery & Rayner, 2010
25	Helvetica (*n* = 2)	Gasser et al., 2005; Wallace et al., 2022
26	KBH Display/Text Regular (*n* = 1)	Beier & Oderkerk, 2019
27	Lato (*n* = 1)	Wallace et al., 2022
28	Lucida (*n* = 1)	Perea, 2013
29	Lucida Bright (*n* = 1)	Moret-Tatay & Perea, 2011
30	Lucida Sans (*n* = 2)	Moret-Tatay & Perea, 2011; Perea, 2013
31	Meta Office Pro (*n* = 1)	Sawyer et al., 2020
32	Monaco (*n* = 1)	Gasser et al., 2005
33	Monotype Corsiva (*n* = 3)	Diemand-Yauman et al., 2011; French et al., 2013
34	Montserrat (*n* = 1)	Wallace et al., 2022
35	Neuzeit Office (*n* = 1)	Krivec et al., 2020
36	Noto Sans (*n* = 1)	Wallace et al., 2022
37	Open Sans (*n* = 2)	Krivec et al., 2020; Wallace et al., 2022
38	Oswald (*n* = 1)	Wallace et al., 2022
39	Palatino (*n* = 1)	Gasser et al., 2005
40	Poynter Gothic (*n* = 1)	Wallace et al., 2022
41	Roboto (*n* = 1)	Wallace et al., 2022
42	Tahoma (*n* = 1)	Banerjee et al., 2011
43	Thesis (*n* = 1)	Sieghart, 2023
44	Times New Roman/Times (*n* = 14)	Al-Samarraie et al., 2017; Banerjee et al., 2011; Bernard et al., 2003; Hojjati & Muniandy, 2014; Ling & van Schaik, 2006; Lonsdale, 2007; Lonsdale, 2014; Lonsdale, 2016; Lonsdale et al., 2006; Perea et al., 2011; Sheedy et al., 2005; Slattery & Rayner, 2010; Slattery & Rayner, 2013; Ukonu et al., 2021
45	Trebuchet (*n* = 2)	Pušnik et al., 2016a; Pušnik et al., 2016b
46	Script MT Bold (*n* = 1)	Slattery & Rayner, 2010
47	Speak Office Pro (*n* = 1)	Sawyer et al., 2020
48	Swiss 721 (*n* = 2)	Pušnik et al., 2016a; Pušnik et al., 2016b
49	Univers/Univers Next Pro (*n* = 2)	Minakata & Beier, 2021; Sawyer et al., 2020

#	Typeface/number of studies (*n*)	Studies
50	Unspecified (*n* = 2)	Geller et al., 2018; Risko et al., 2011
51	Utopia (*n* = 1)	Wallace et al., 2022;
52	Verdana (*n* = 6)	Banerjee et al., 2011; Hojjati & Muniandy, 2014; Krivec et al., 2020; Pušnik et al., 2016a; Pušnik et al., 2016b; Sheedy et al., 2005

Appendix H: Results From the Reviewed Studies Comparing Serif and Sans Serif Typefaces (*N* = 19)

Study	Serif preference	Sans serif preference	Serifs and sans serif conditional benefits	Null effect of serifs	Inconclusive
Arditi & Cho, (2005)				•	
Banerjee et al., (2011)			•		
Bernard et al., (2003)				•	
Gasser et al., (2005)	•				
Hojjati & Muniandy, (2014)		•			
Ling & van Schaik, (2006)					•
Minakata & Beier, (2022)				•	
Minakata et al., (2023)					•
Moret-Tatay & Perea, (2011)		•			
Perea, (2013)				•	
Pušnik et al., (2016a)	•				
Pušnik et al., (2016b)					•
Sheedy et al., (2005)				•	
Sieghart, (2023)			•		
Slattery & Rayner, (2010)	•				
Slattery & Rayner, (2013)					•
Soleimani & Mohammadi, (2012)				•	
Ukonu et al., (2021)			•		
Wallace et al., (2022)			•		
Total	3	2	4	6	4

Authors

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