

Technology Feature Brief

Automated Text Simplification

Automated text simplification (ATS) uses automated processes like natural language processing or machine learning to change how texts are worded to make them easier to understand. Varying the complexity of a text can benefit readers of different ages and levels of engagement or those who approach text with differing goals. Having automated recommendations for types of simplifications, with options for alternate levels of text complexity, means reducing barriers while empowering learners to make the best choices for them.

In this example from [Rewordify](#), complex words in the text are identified and highlighted automatically, and replacement suggestions for these highlighted words are provided in the margins.

There are 8 hard words. Learn 5 of them, or all of them?

Reading time: 27 seconds. | Total points: 0 | ? | X

[Rewordified text](#) [Stats](#) [Share](#) [Print / Learning activities](#) [Parts of speech](#)

Navy Lieutenant Nunn arrived this morning at Lord Dartmouth's with letters from General Gage, Lord Percy, and Lieutenant-Colonel Smith **concerning the** events that **occurred** on April 19th and involved the British troops, the colonial **militia**, and **several** rebel parties. Lieutenant-Colonel Smith was **concerned about** the **chaos** that was **occurring** north of Boston and sent six light infantry companies to secure two bridges near Concord. On their way to complete this order, the companies found a group of armed country people near the road in Lexington. As the British troops approached them to find out why they had **assembled**, the members of this **militia** ran off in great confusion. During this time, **several** shots were fired at the British troops from behind a stone wall, a meeting house, and other homes. One British soldier

concerning the about the
occurred happened
militia group of armed citizens
several (more than two, but not a lot of)
concerned about worried about
chaos noise and confusion
occurring happening
assembled got together

Research

- Research suggests people who struggle with reading, including those with reading disabilities, intellectual disabilities, and visual impairments, process human-simplified texts more effectively than non-simplified texts, suggesting that ATS has great potential.

[Saggion, 2017](#)

[Djamasbi et al., 2016](#)

[Djamasbi, Shojaeizadeh, Chen, & Rochford, 2016](#)

[Shojaeizadeh, Djamasbi, Chen, & Rochford, 2017](#)

- Most automatic text simplification tools use lexical simplification and syntactic simplification. Lexical simplification is modifying vocabulary to make a text easier to understand. Syntactic simplification is transforming long sentences into simpler sentences. **Syntactic simplification is more difficult to automate than lexical simplification; it requires a large amount of human input to train a system to implement this.**

[Saggion, 2017](#)

[Shardlow, 2014](#)

- Current commercial and open-source ATS programs are still in their infancy. Most cannot function entirely as AI and often have behind-the-scenes humans reviewing and editing automated suggestions. Additionally, it can be difficult to determine whether ATS successfully improves a text's readability since neither ATS tools nor automated tools for measuring readability can fully account for a text's meaning or the relationships among the words. ATS products like Snap & Read, Rewordify, and Kindle Word Wise attempt to simplify texts while preserving their original meanings by providing definitions and simplified word replacements. No research has been conducted to determine whether these types of product features improve or detract from readability and text comprehension. **More research is needed to determine how good, automated text simplification needs to be for it to be considered useful.**

[Chen, Rochford, Kennedy, Djamasbi, Fay, & Scott, 2016](#)

[Siddharthan, 2014](#)

Related Guidelines

Automated text simplification is related to existing guidelines and best practices, including the Web Content Accessibility Guidelines (WCAG) and the Universal Design for Learning (UDL) Guidelines. Connections include:

- UDL Guidelines
 - [UDL Checkpoint 8.2](#): Vary demands and resources to optimize challenge
 - [UDL Checkpoint 5.3](#): Build fluencies with graduated levels of support for practice and performance
 - [UDL Checkpoint 7.3](#): Minimize threats and distractions
- WCAG includes requirements that address cognitive accessibility. The requirements appear in [Guideline 3.1 Readable](#): Make text content readable and understandable, specifically [Success Criterion 3.1.5 Reading Level \(Level AAA\)](#): When text requires reading ability more advanced than the lower secondary education level after removal of

proper names and titles, you need to ensure that supplemental content, or a version that does not require reading ability more advanced than the lower secondary education level, is available.

Automated Text Simplification Examples

Text Simplification:

- [Snap & Read](#)
- [Rewordify](#)
- [Kindle Word Wise](#)
- [IBM Content Clarifier](#) (also summarizes)

Summarization:

- [Text Compactor](#)
- [SMMRY](#)
- [Open Text Summarizer](#)

Readability & Complexity Statistics Only

- [textstat](#)
- [Readable](#)

Features in some popular products for text simplification, summarization, and readability statistics:

- Free, standalone webpage: Rewordify, Text Compactor
- Free, Open Source: textstat
- Users can change the difficulty level of output text: Rewordify, Snap&Read
- Users can change the presentation style of the output text: Rewordify



This content was developed under a grant from the US Department of Education, #H327A170002. However, the contents do not necessarily represent the policy of the US Department of Education, and you should not assume endorsement by the Federal Government. Project Officer, Celia Rosenquist.



Except where otherwise noted, CISL content is licensed under a Creative Commons Attribution 4.0 International License.