

How WCAG 2.1 benefits people with cognitive impairment

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Herr

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Meet the presenters: Valorie Sundby



Background: Ten years of experience as a web accessibility specialist has taught me that I still have a lot to learn. The best move I made in this career was calling our local community college to work as an academic aide and proctor for the disability services department. Working with and for people with disabilities is a mind opening experience.

Current gig: Optum Digital Accessibility Engineer

My motto: Accessibility is a journey, not a destination

Meet the presenters: Vanessa Howle



Background: I have over 20 years experience in Accessibility/ Usability and over 21 years in Section 508. As an SME with disabilities, I have worked for many US Government agencies. I was featured on NASA TV for the Goddard Web Masters Speech on Cold Fusion and Accessibility for the Blind and the Keynote Speaker for DC Web Woman's Conference on Accessibility. I have experience and certifications additionally in Cyber Security, Far Clause, and Stop work orders.

Current gig: Optum Digital Accessibility Engineer

Motto: Accessibility starts at the beginning, not the end

Meet the presenters: Karen Herr



Background: 20 “odd” years of software development, working with back-end code, system test, requirements, design, project management, front-end code, and accessibility.

I “cut my accessibility teeth” working on federal contracts where Section 508 was the law. The importance of accessibility hit home when my father was diagnosed with macular degeneration and needed low-vision aids to surf the web, read his Kindle, and publicly post humiliating Facebook messages to his grandkids.

Current gig: Optum Digital Accessibility Engineer

Motto: It’s a (keyboard) trap!

What we'll cover today

- Cognitive impairment categories
- What is cognitive load?
- Impacts of Cognitive impairment
- How does WCAG 2.1 help?

Cognitive Impairment

Cognitive Impairment types

- **Malfunction – something is broken**
 - Learning Disability, head injury, cPTSD
- **Instability – short period impairment**
 - Anxiety, excessive stimulation, physicochemical changes
- **Progressive decline – deterioration over time**
 - Progressive disease (Alzheimer's), drug use/abuse

In the news

- Yale researchers Sally and Bennett Shaywitz – 1983 study tracking 400 Kindergarteners found 1 in 5 have dyslexia
- Dr. Laura Cassidy – 50% of those incarcerated have dyslexia

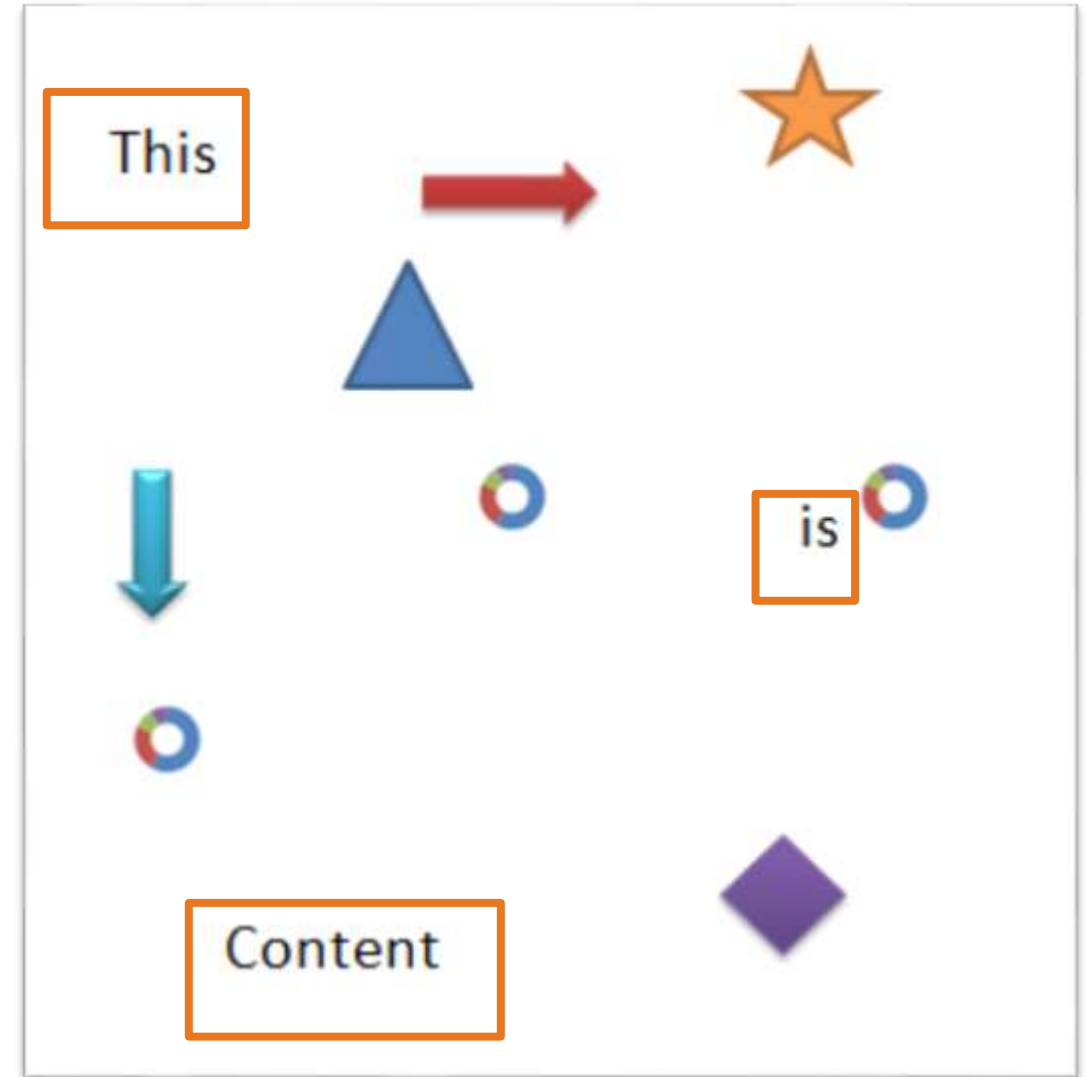
[CBS News: Dyslexia - cracking the code](https://www.cbsnews.com/video/dyslexia-cracking-the-code/)

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Cognitive Load

Extrinsic Load

The effort it takes to perceive the content.

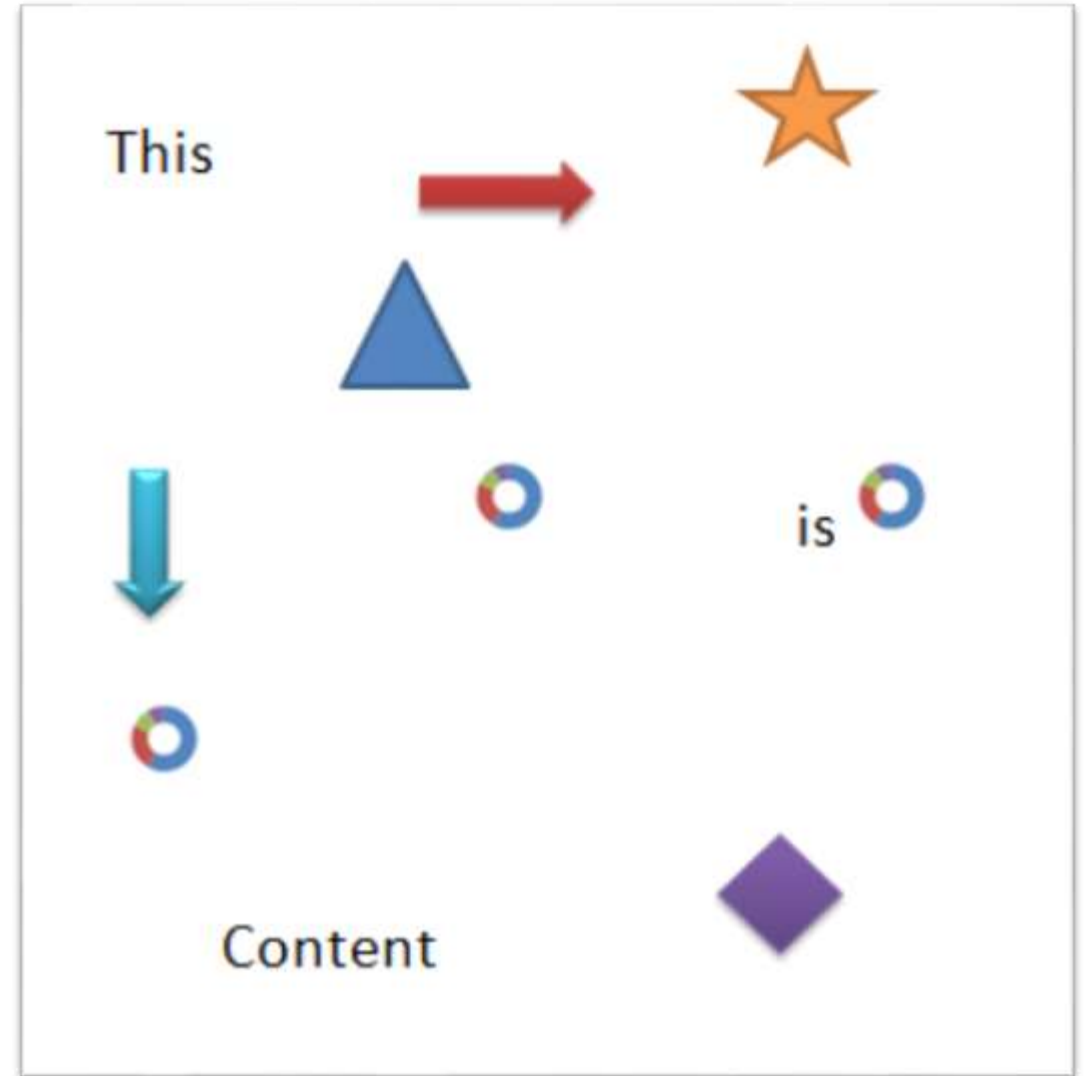


Extrinsic

Intrinsic Load

The effort it takes to understand the information.

This is content.

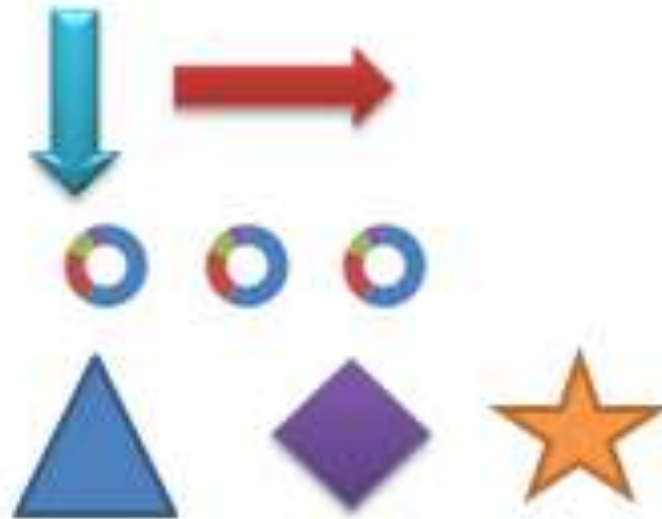


Intrinsic

Germane Load

The effort it
takes to store
the information.

This is content. Content is information.



Germane

Impacts of cognitive impairment

Quote from a trainer

“The cognitive impairment will always be there. Usually, when there is cognitive impairment, there is a level of anxiety that mounts quickly and stress can develop quickly. So perhaps, by creating a very positive environment, I can minimize anxiety. Of course, the most effective way is to find what works for each particular client. That’s always very unique based on the individual.” (Perez, 2019).

Math

Word problem

The sheptles clagged at x plobs per mocbets. The heffepts clagged at y plobs per netglips. Who got to the hestflef first?

Interview with a trainer

Key points training people with cognitive disabilities:

- 1. Routine/Process to maximize comfort**
- 2. Reduce distractions.**
- 3. Provide a cheerful environment 😊**
- 4. Teach to the individual's learning method**
- 5. Pace to the individual. (reduces stress)**

Assistive technology for cognitive support

Personalization is Key.

The following features have assisted me greatly in my journey:

- Access to word definitions, synonyms and antonyms
- Highlighting in different colors
- Write notes on the page and extract information
- Assistance to read and pronounce words

Speech and Auditory processing

Four basic skills in auditory processing:

Auditory Discrimination: song lyrics, screen readers

Figure-to-Ground Discrimination: meetings, conferences

Auditory Memory: remembering names – verbal introductions

Auditory Sequencing: write everything down

Anxiety and cognition

- Often a comorbid impairment
- Highly variable
- Impact changes quickly

How does WCAG help?

WCAG 2.1 helps

The success criteria impacts cognitive load in the following ways:

- **Eliminates or reduces:** complexity, time limits, distractions
- **Optimizes:** orientation, language, text size and spacing
- **Assists:** labels and instructions, auto-complete, consistency

1.3.4 Orientation

Continuous eye tracking can cause fatigue.

- Allows user to adjust orientation to “sweet spot”.

Related Success Criteria:

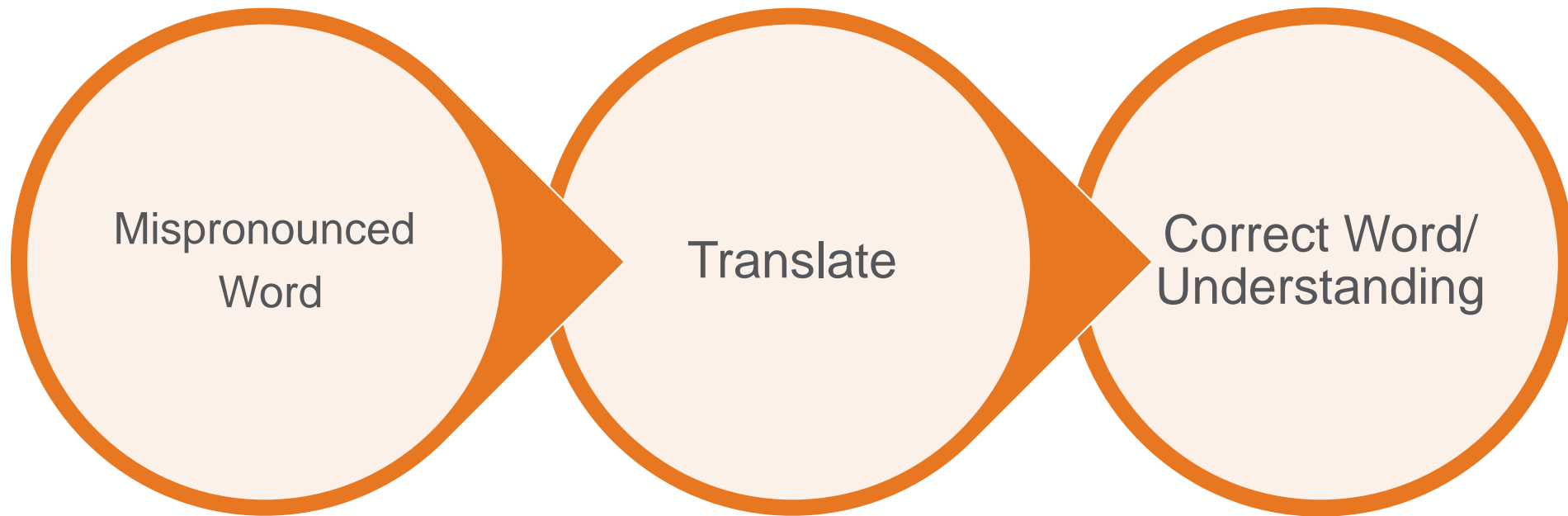
- 1.4.4 Resize Text
- 1.4.10 Reflow
- 1.4.11 Text Spacing

Extrinsic

Intrinsic

3.1.1 Language / 3.1.2 Language of parts

- Screen reader pronunciation and intonation
- Incorrect language leads to mispronunciation



Extrinsic

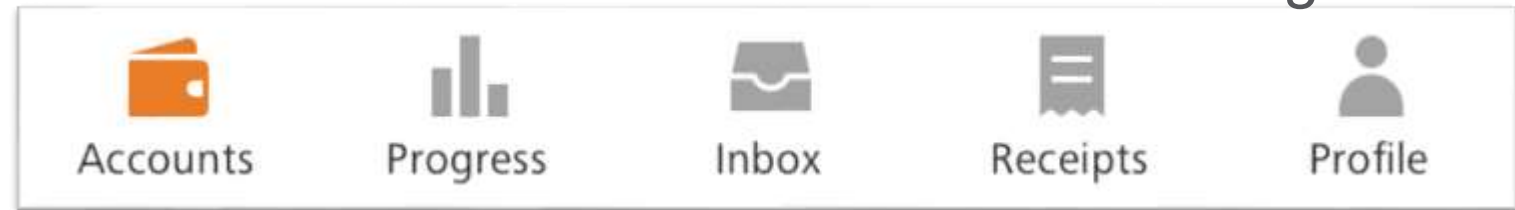
Intrinsic

1.1.1 Non-Text Content

Cognitive support iconography

- Pair text with icon
- Decorative
- Mobile

Mobile Bottom Tabbed Navigation



Extrinsic

Intrinsic

Germane

Hand movement impacts cognitive load

Success criteria that lighten the load:

1.4.13 Content on hover or focus,

2.1.4 Character Key Shortcuts

2.5.1 Pointer Gestures

2.5.2 Pointer Cancellation

2.5.4 Motion Actuation

2.5.6 Concurrent Input Mechanisms

Extrinsic

Intrinsic

WCAG Success Criteria lightens the load

Extrinsic:

- Leaves content visible to provide time to comprehend
- Provides single point of operation to simplify interactions
- Allows the use of a familiar interface (keyboard) instead of complex gestures

Intrinsic:

- Reduces anxiety by ability to undo inadvertent actions
- Removes fear of erratic motion triggering an event
- Eliminates the need to learn a new interface
- Eliminates the need to learn new gestures

Extrinsic

Intrinsic

Forms: Guideline 1.3 Adaptable

Make content available in a way that can be perceived.

Provides the connection between the information and what the user is asked to do.

Please select cognitive load type:

- ☐ Extrinsic
- ☐ Intrinsic
- ☐ Germane

Extrinsic

Intrinsic

Germane

Forms: Guideline 1.4 Distinguishable

Make the default presentation as easy to perceive as possible.



Forms: Guideline 3.3 Input Assistance

Aim for first time success:

- Provide enough information
- Formatting instruction
- Ability to review and modify

Extrinsic

Intrinsic

Germane

Questions

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Thank you!

