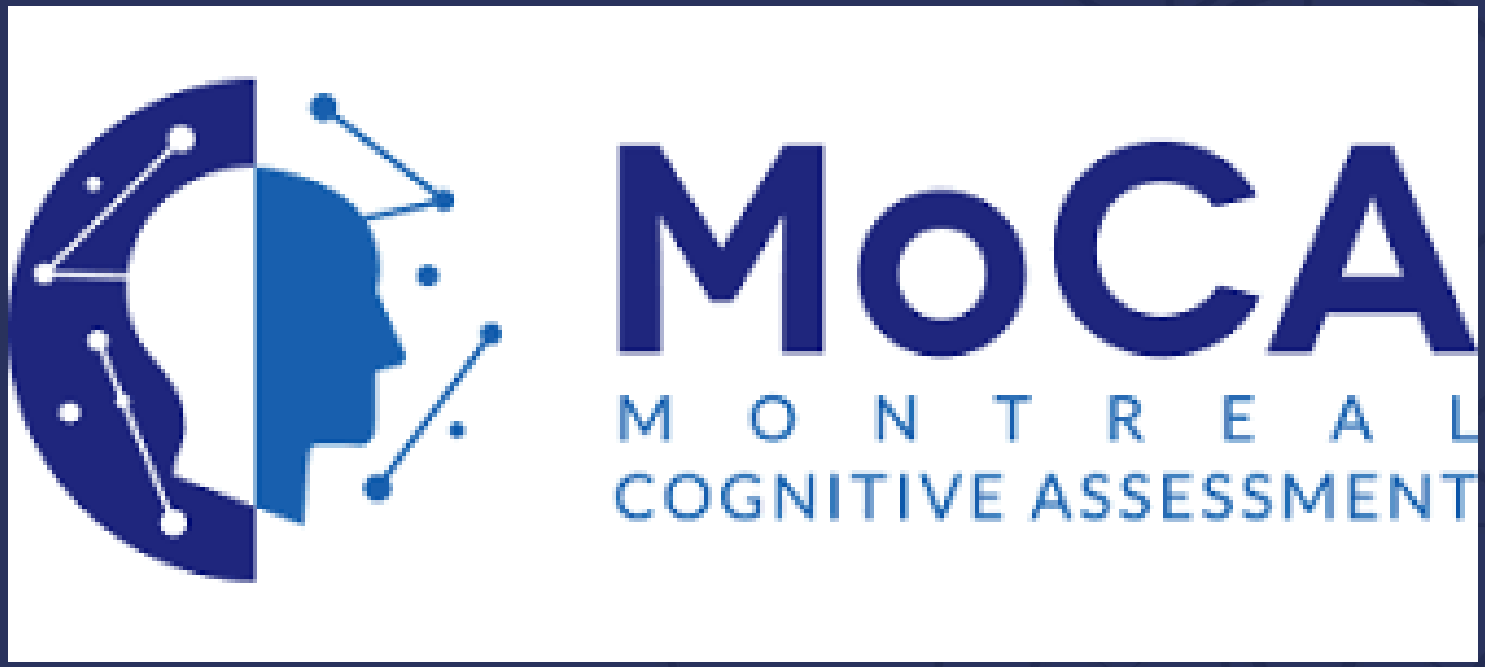
Everywhere, Everyone

People are Diverse


MoCA
MONTREAL
COGNITIVE ASSESSMENT

An Example of Diversity

"Aced" the MOCA.

"Flunked" the MOCA

TESTING TESTING

Creator of cognition test Trump brags of acing says it's 'supposed to be easy' for unimpaired people

July 21, 2020

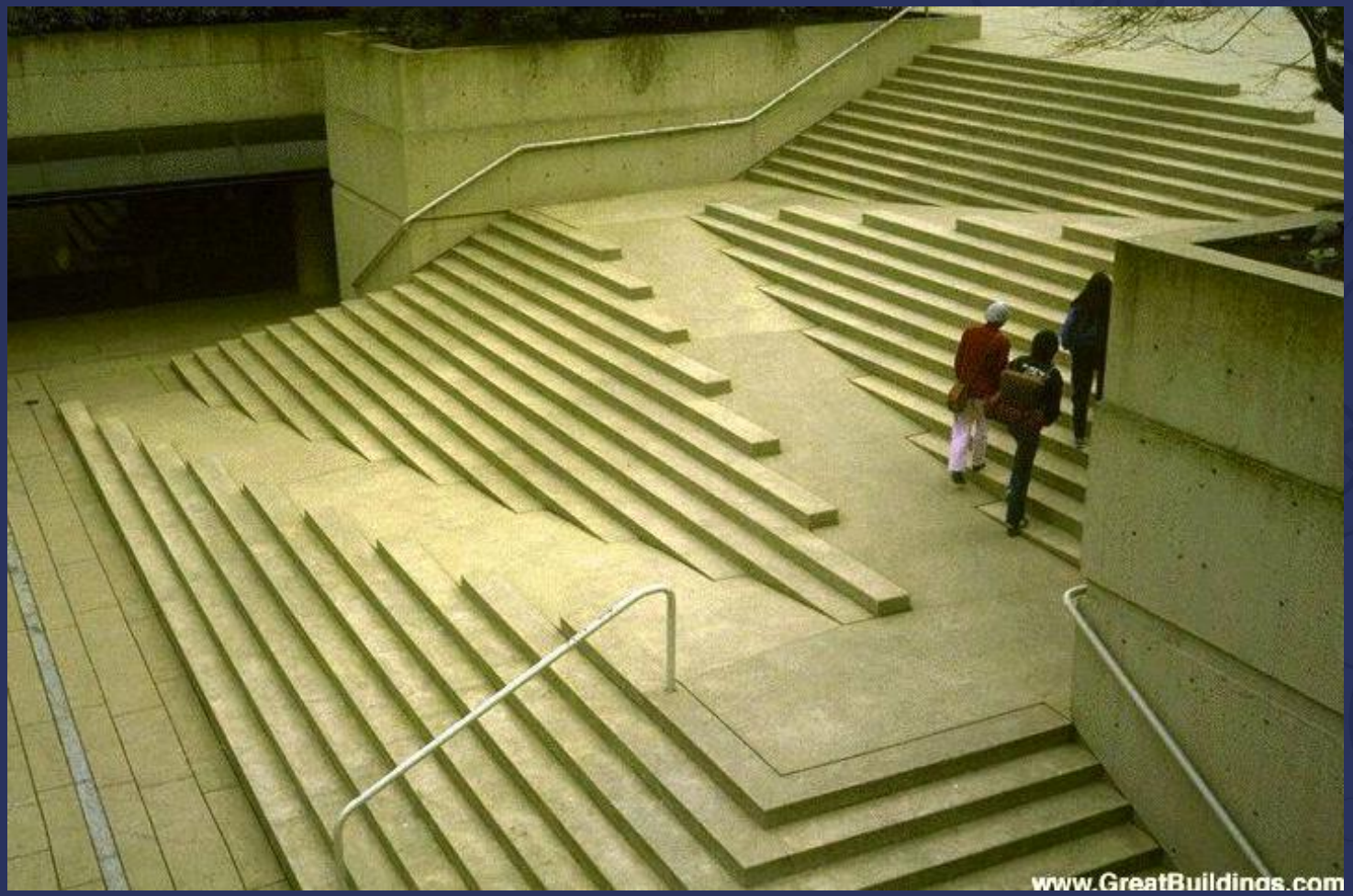
President Trump told Fox News host Sean Hannity earlier in July that he "aced" a cognitive test at Walter Reed Medical Center "very recently," and Fox News anchor Chris Wallace did not seem overly impressed when Trump brought up the test again during his *Fox News Sunday* interview over the weekend. Wallace said he also took the Montreal Cognitive Assessment (MoCA) test after Trump said he passed it, and "it's not the hardest test. It shows a picture and it says, 'what's that,' and it's an elephant."

Universal Design for Learning

Some people face more barriers than others

Retrofitting is highly problematic

Universal Design



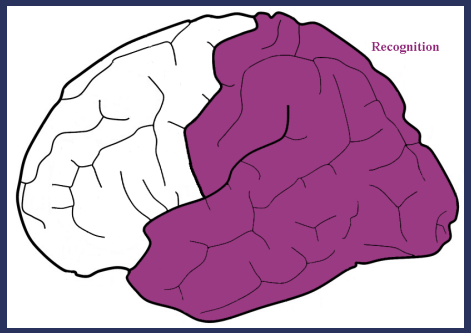
...better for Everyone

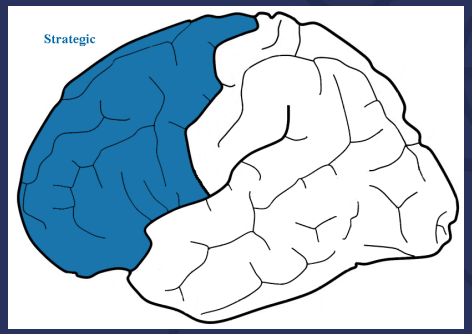
But careful design matters

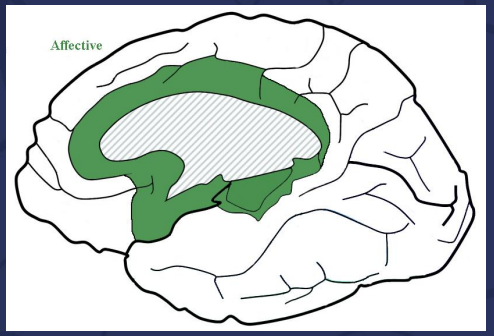
But what is Universal Design for Learning?

Universal Design for Learning

A research-based framework for identifying individual differences in learning

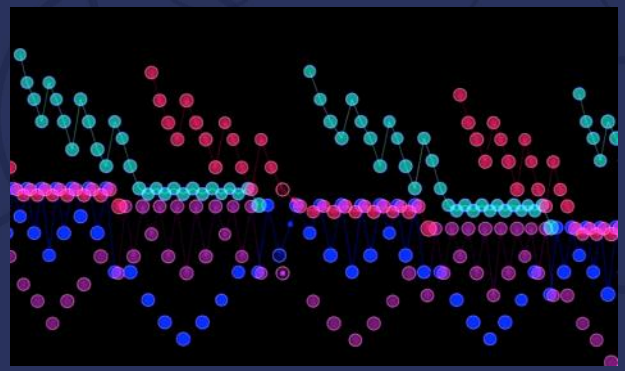






..and designing learning activities that meet the challenge of diversity

I. Provide Multiple Means of Representation	II. Provide Multiple Means of Action and Expression	III. Provide Multiple Means of Engagement
Perception	Physical action	Recruiting interest
Language, expressions, and symbols	Expression and communication	Sustaining effort and persistence
Comprehension	Executive function	Self-regulation



by reducing barriers for some and increasing options for all

I. Provide Multiple Means of Representation	II. Provide Multiple Means of Action and Expression	III. Provide Multiple Means of Engagement
Perception	Physical action	Recruiting interest
Language, expressions, and symbols	Expression and communication	Sustaining effort and persistence
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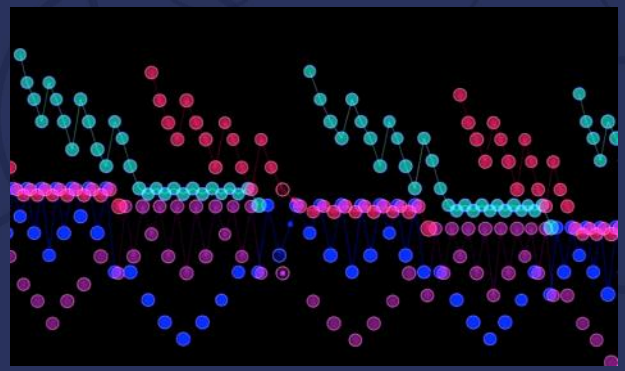
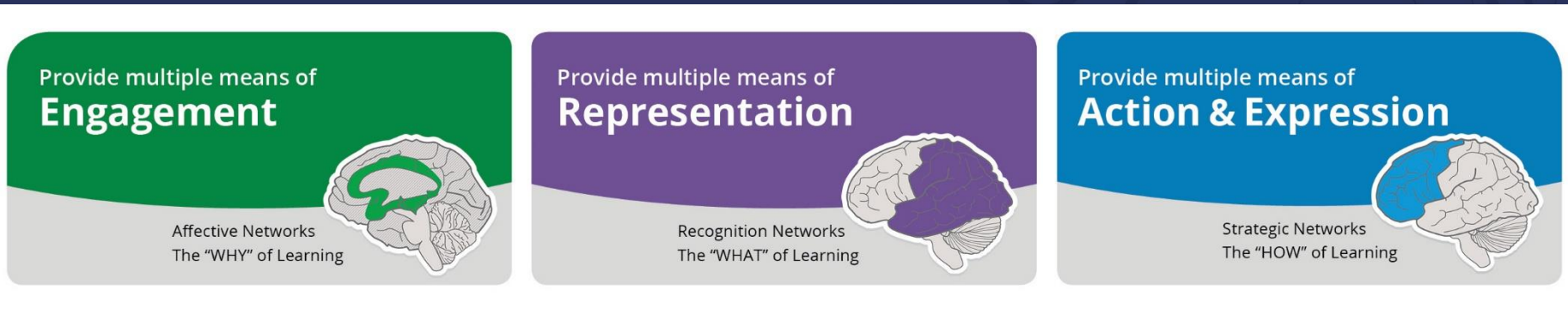


3 Principles of UDL



Necessary for *some*, good for *all*

Universal Design for Learning Guidelines

Provide Multiple Means of Engagement

Purposeful, motivated learners

Provide options for self-regulation
- Promote expectations and beliefs that optimize motivation
- Facilitate personal coping skills and strategies
- Develop self-assessment and reflection

Provide options for sustaining effort and persistence
- Heighten salience of goals and objectives
- Vary demands and resources to optimize challenge
- Foster collaboration and community
- Increase mastery-oriented feedback

Provide options for recruiting interest
- Optimize individual choice and autonomy
- Optimize relevance, value, and authenticity
- Minimize threats and distractions

Provide Multiple Means of Representation

Resourceful, knowledgeable learners

Provide options for comprehension
- Activate or supply background knowledge
- Highlight patterns, critical features, big ideas, and relationships
- Guide information processing, visualization, and manipulation
- Maximize transfer and generalization

Provide options for language, mathematical expressions, and symbols
- Clarify vocabulary and symbols
- Clarify syntax and structure
- Support decoding of text, mathematical notation, and symbols
- Promote understanding across languages
- Illustrate through multiple media

Provide options for perception
- Offer ways of customizing the display of information
- Offer alternatives for auditory information
- Offer alternatives for visual information

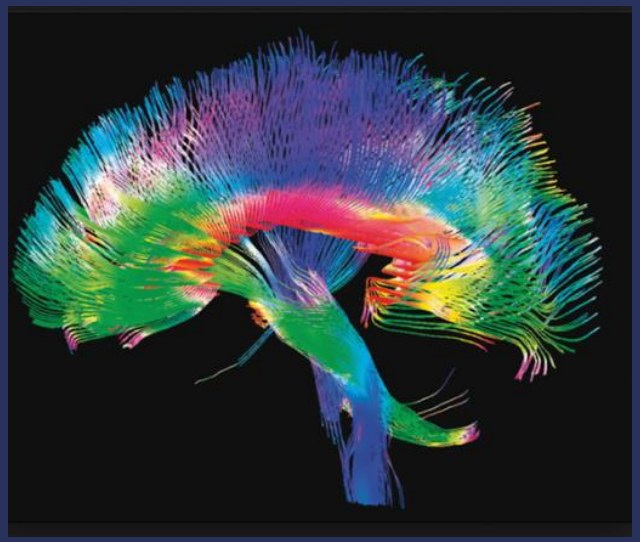
Provide Multiple Means of Action & Expression

Strategic, goal-directed learners

Provide options for executive functions
- Guide appropriate goal-setting
- Support planning and strategy development
- Enhance capacity for monitoring progress

Provide options for expression and communication
- Use multiple media for communication
- Use multiple tools for construction and composition
- Build fluencies with graduated levels of support for practice and performance

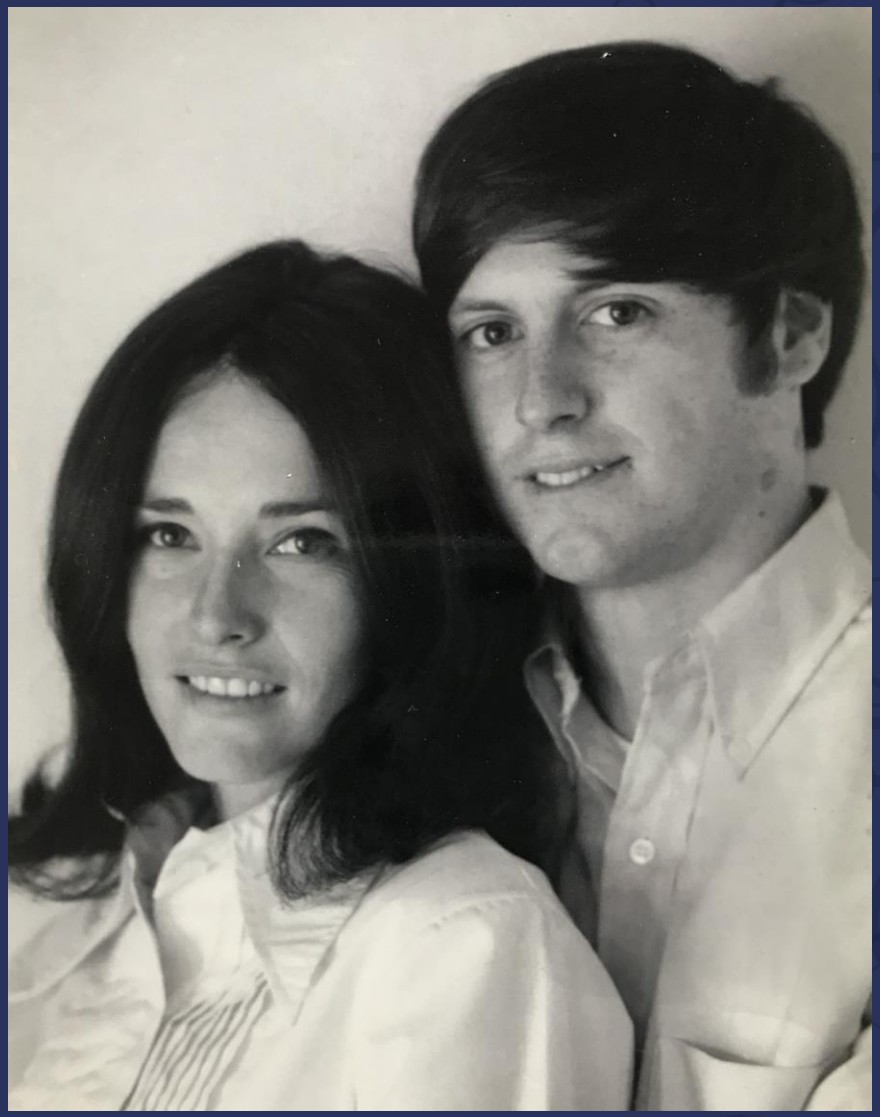
Provide options for physical action
- Vary the methods for response and navigation
- Optimize access to tools and assistive technologies



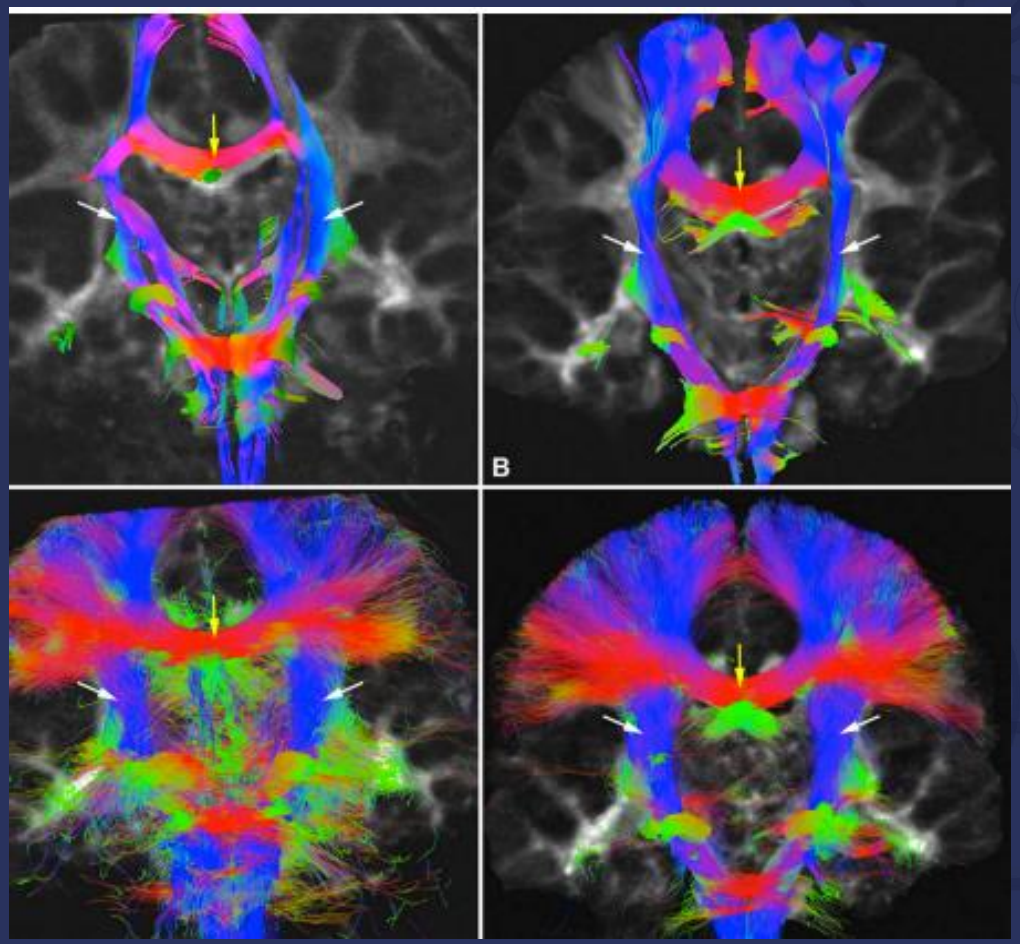
Advances in learning sciences

Advances in learning technologies

What do individual differences look like in the brain?



Neuroimaging: Individual differences are huge.



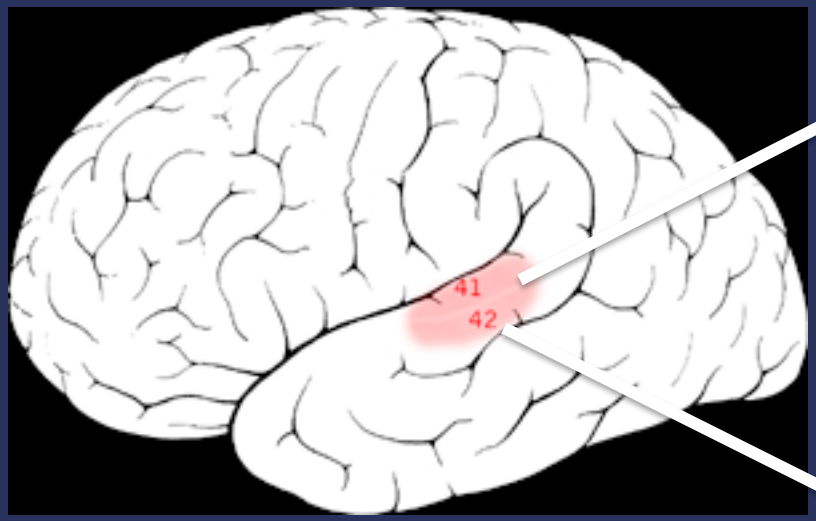
David vs Ruth on Music

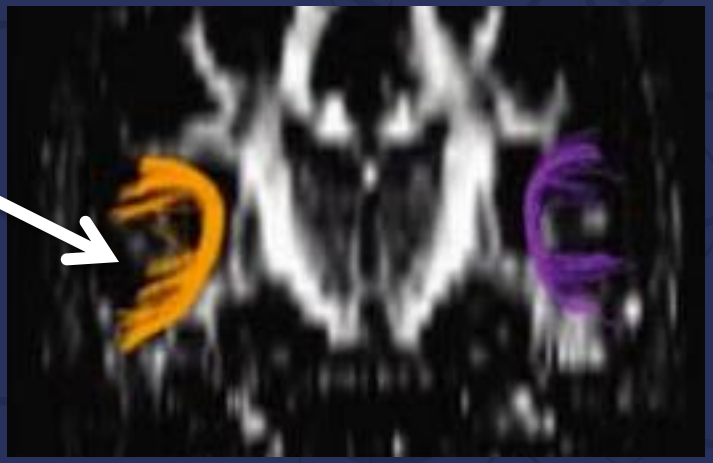
Perfect Pitch

David vs Ruth on Music

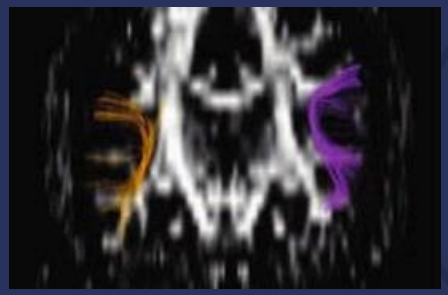
Not so much

Perfect Pitch


41
42



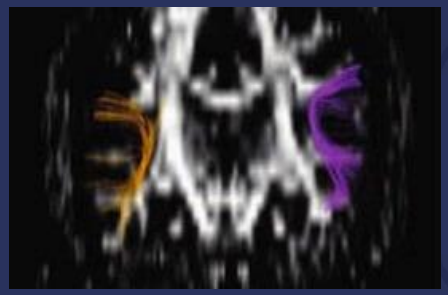
David vs Ruth



David is “hypo-connected”

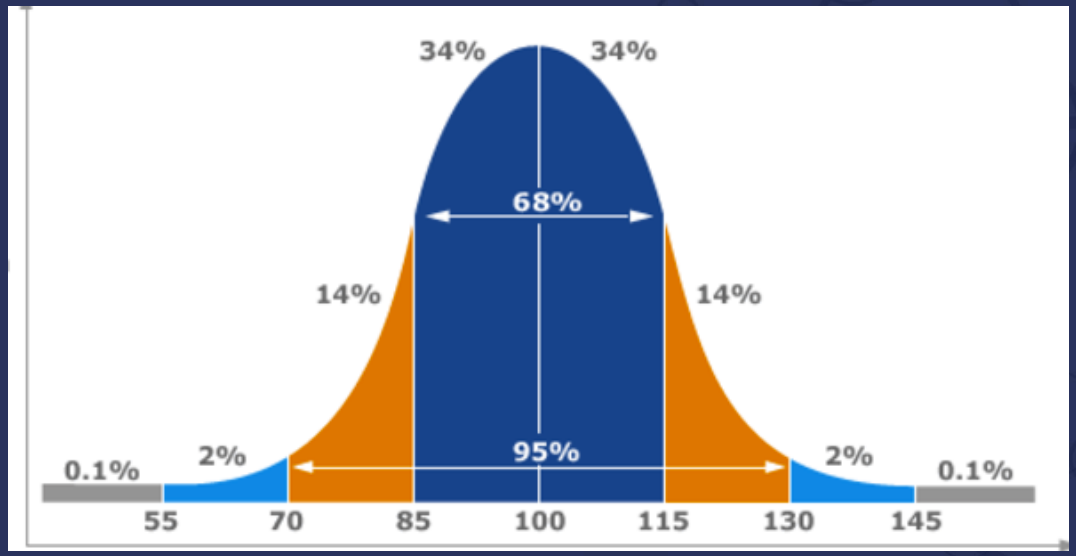
Ruth is “hyper-connected”

Who has a ”disability”?

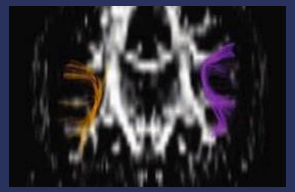


It depends……

Actually, we're both on a Spectrum

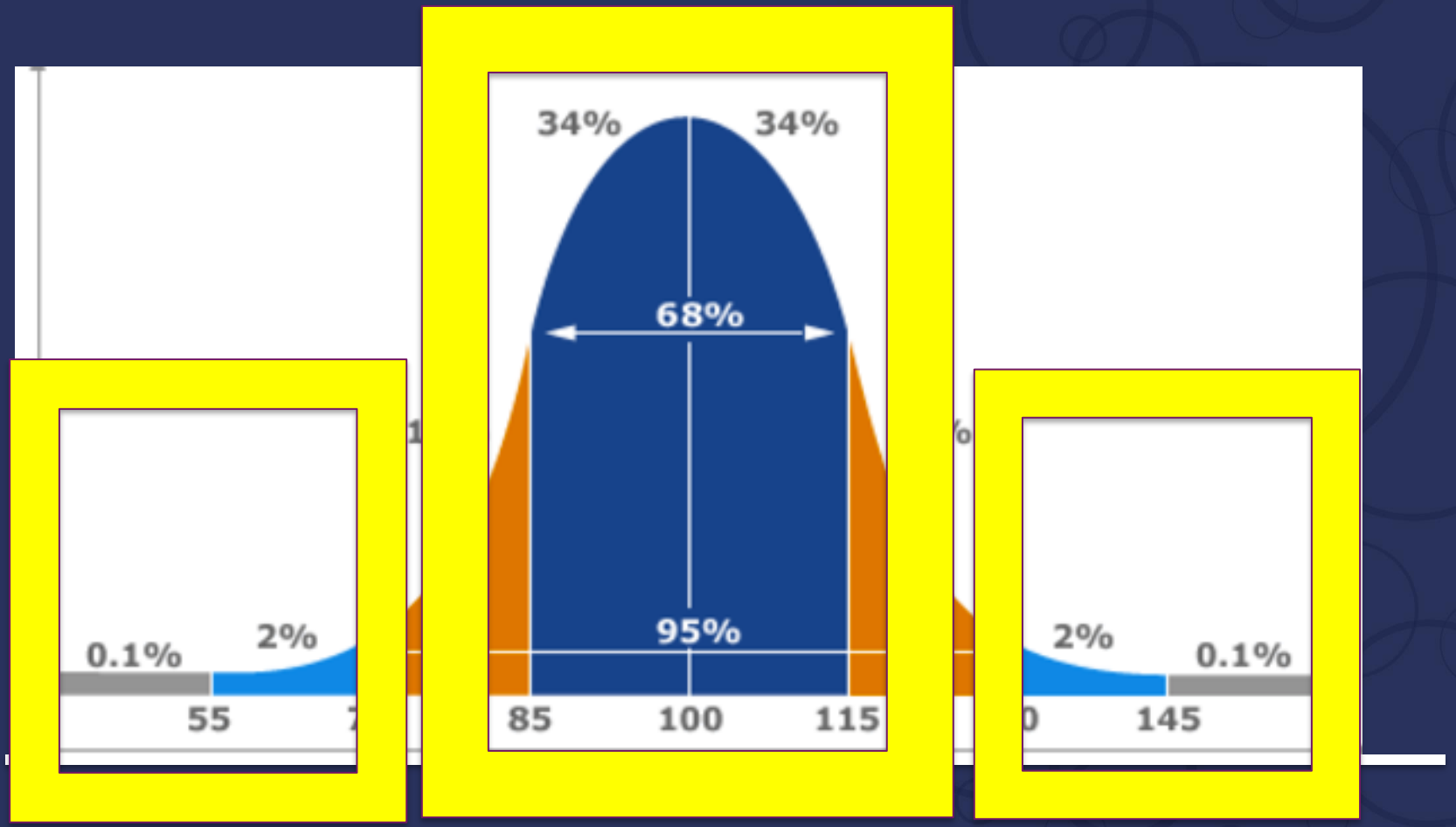


Hypo-acuity of pitch



Hyper-acuity of pitch

But the culture sees categories..



Defective
Disabled

Regular
Average

Gifted
Genius

What determines where each of us are on the spectrum?

Biology Matters

1) Neuroanatomy Matters
2) Phylogeny Matters
3) Genes Matter

What determines where each of us are on the spectrum?

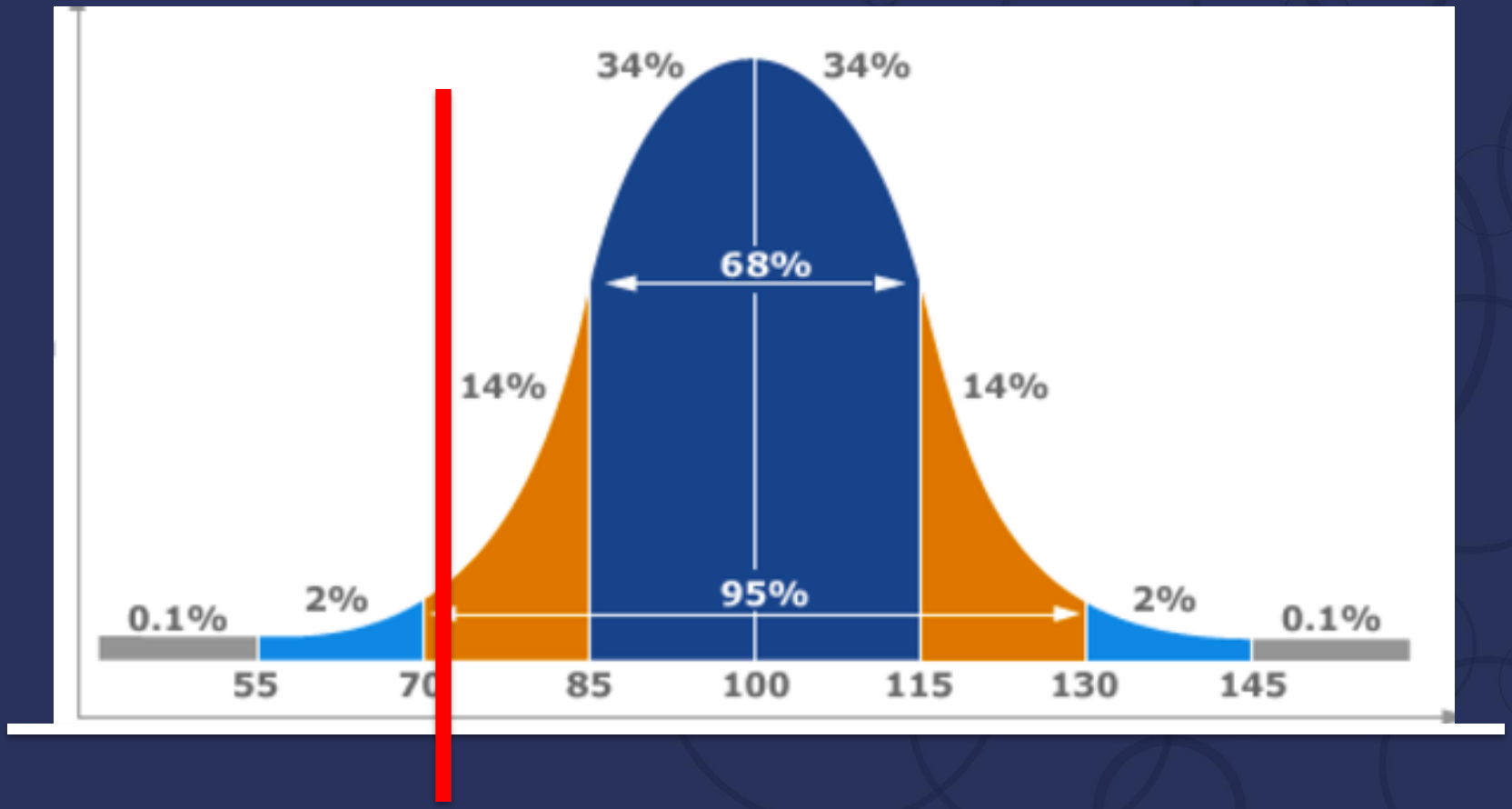
Biology Matters

1) Neuroanatomy Matters
2) Phylogeny Matters
3) Genes Matter

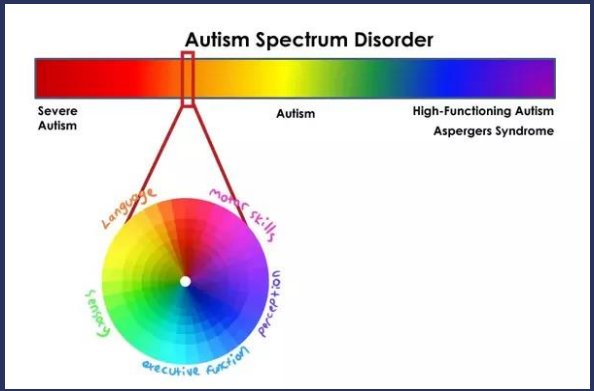
Environment Matters

4) Culture Matters
5) Language Matters
6) Instruction Matters
7) Timing Matters
8) Technology Matters
9) Context Matters

Both Biology and Environment determine the cut-off for disability, abnormality



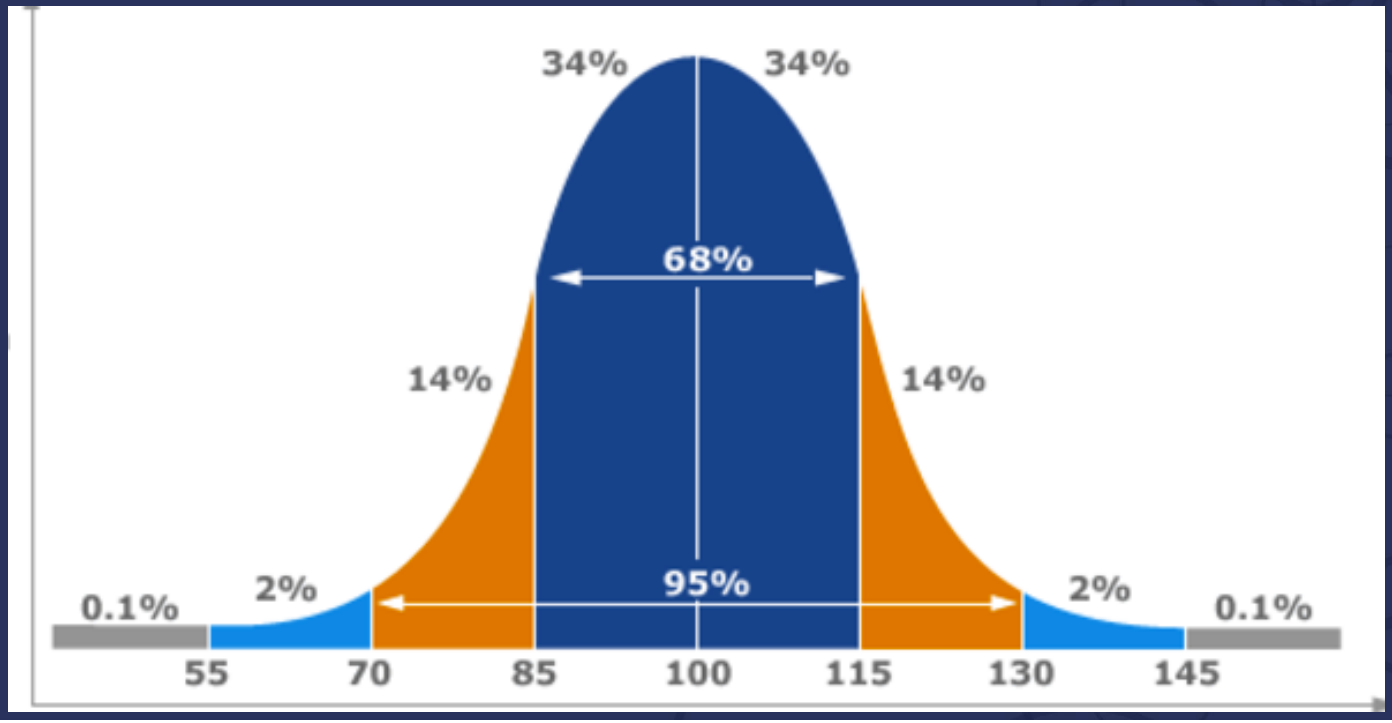
Revisiting the Autism Spectrum Traditional View

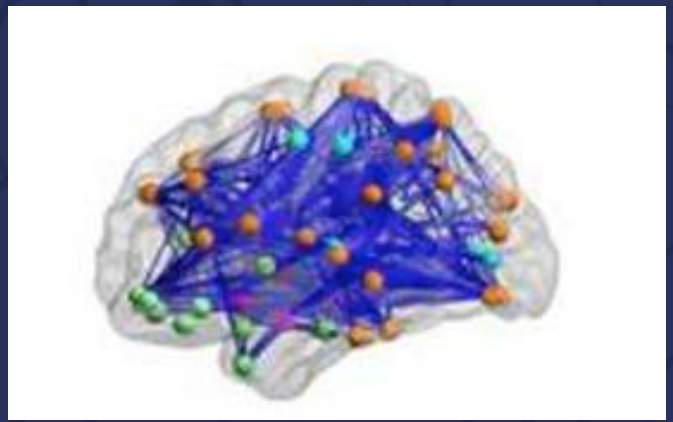


Abnormal, Disabled

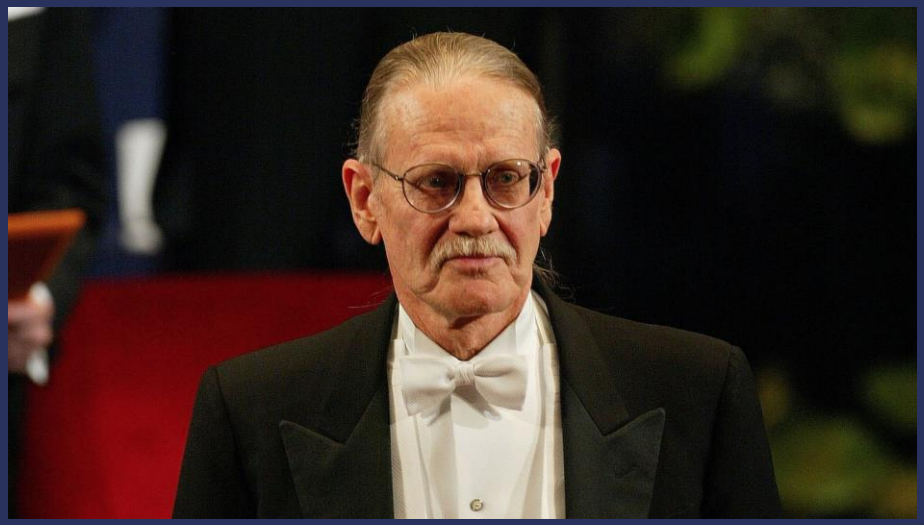
Normal, Non-Disabled

Revisiting the Autism Spectrum





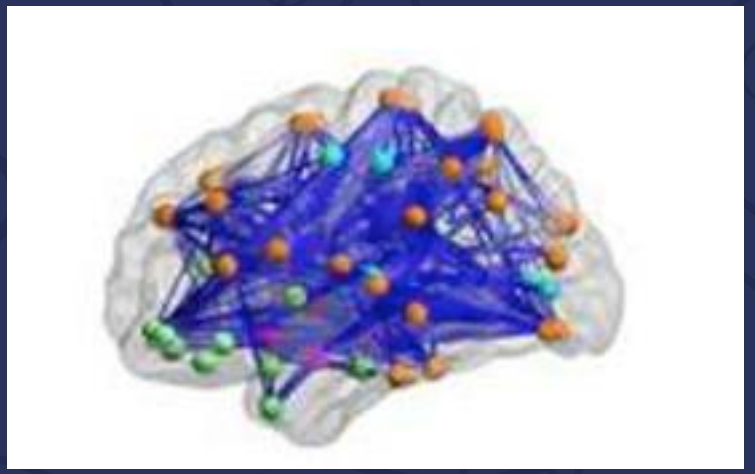
Vernon Smith



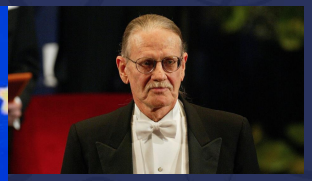
Greta Thunberg

Another “Spectrum”

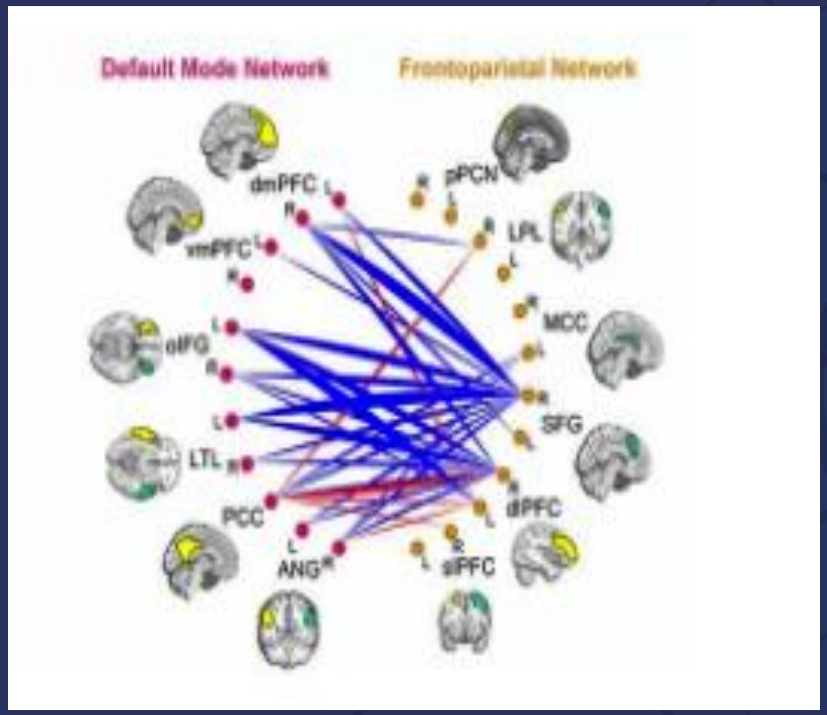
Hypo-connectivity



Hyper-connectivity



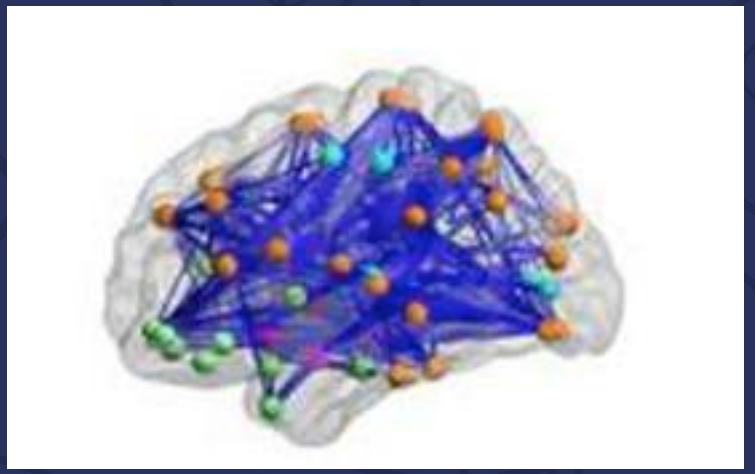
Tim Berners-Lee



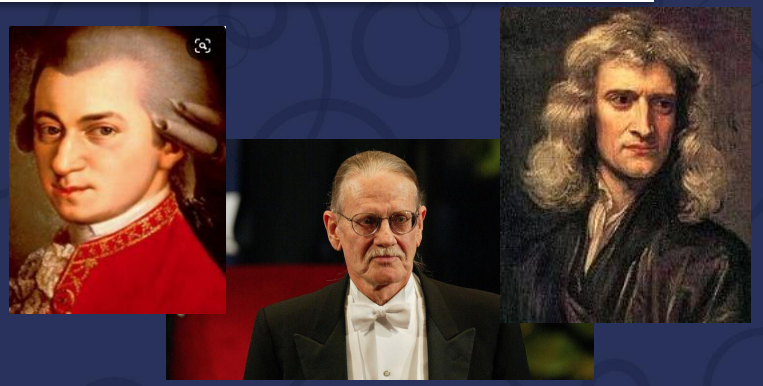
Sripada, C.S., Kessler, D. and Angstadt, M. (2014)

Another “Spectrum”

Hypo-connectivity



Hyper-connectivity



What determines where each of us is on the "autism" spectrum?

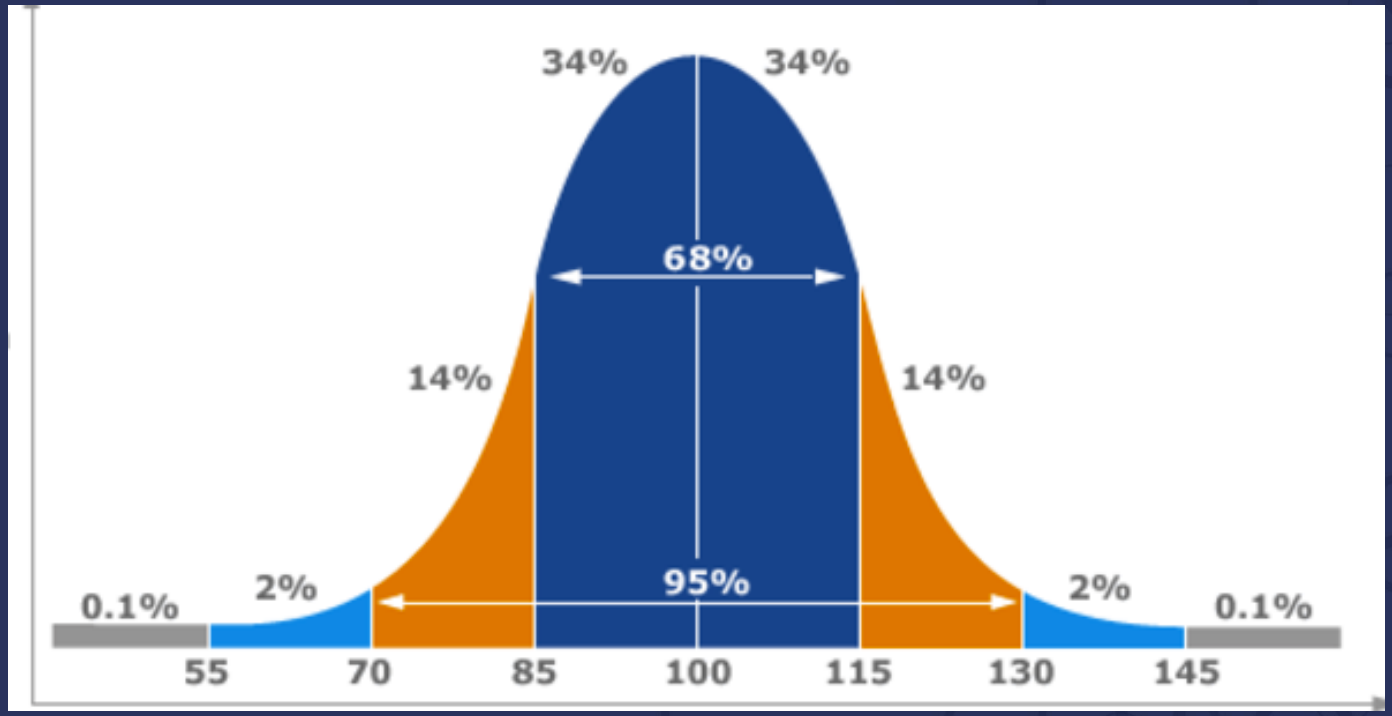
Biology Matters

1) Neuroanatomy Matters
2) Phylogeny Matters
3) Genes Matter

Environment Matters

4) Culture Matters
5) Language Matters
6) Instruction Matters
7) Timing Matters
8) Technology Matters
9) Context Matters

Where am I on the autism Spectrum?

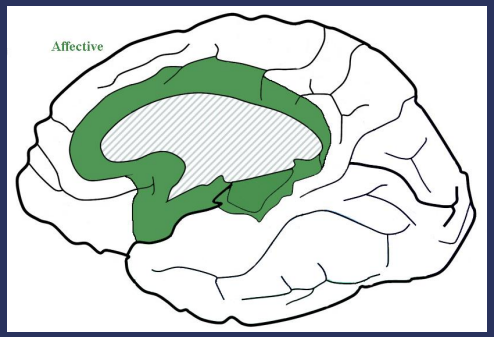


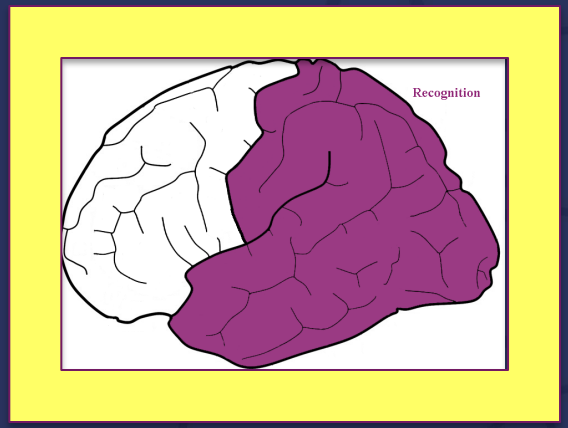
It depends……

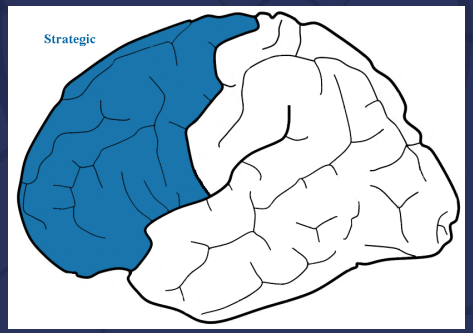
I am on the Spectrum,

And so are you.

Where did the three principles come from?

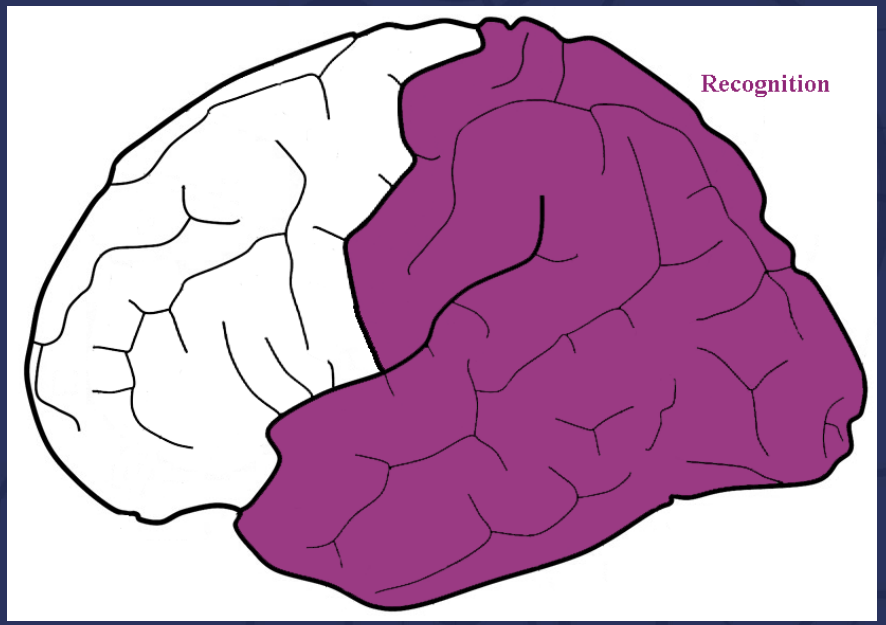




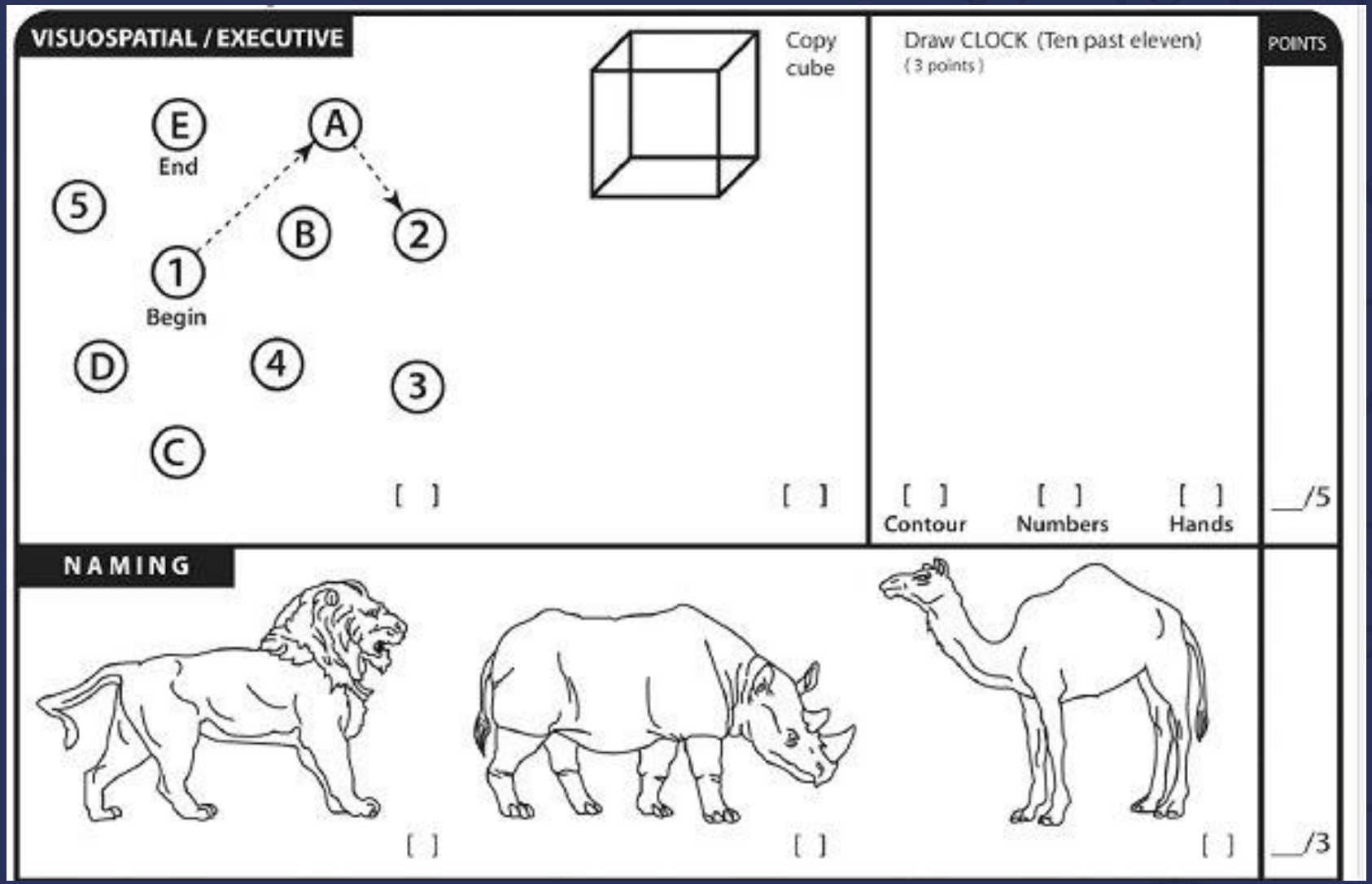


Recognition Networks
What's that?

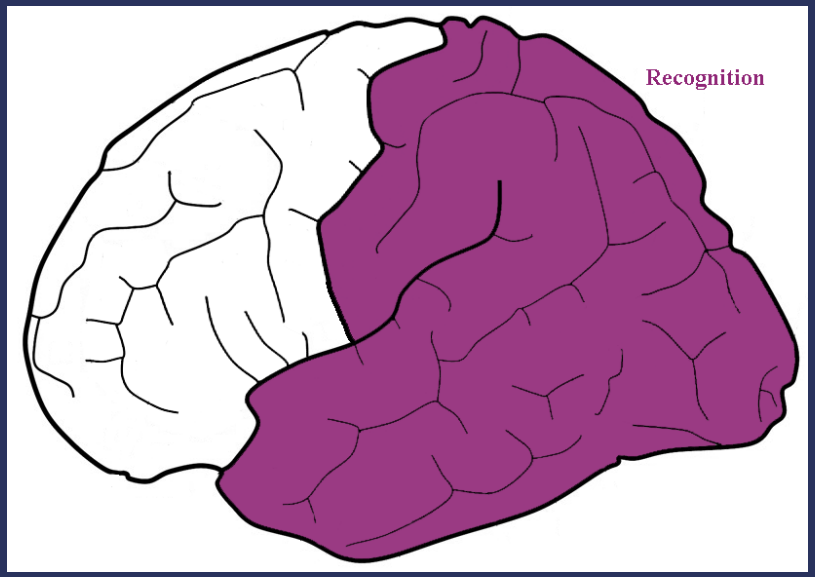
Perceive,
understand,
and remember
information from
the environment

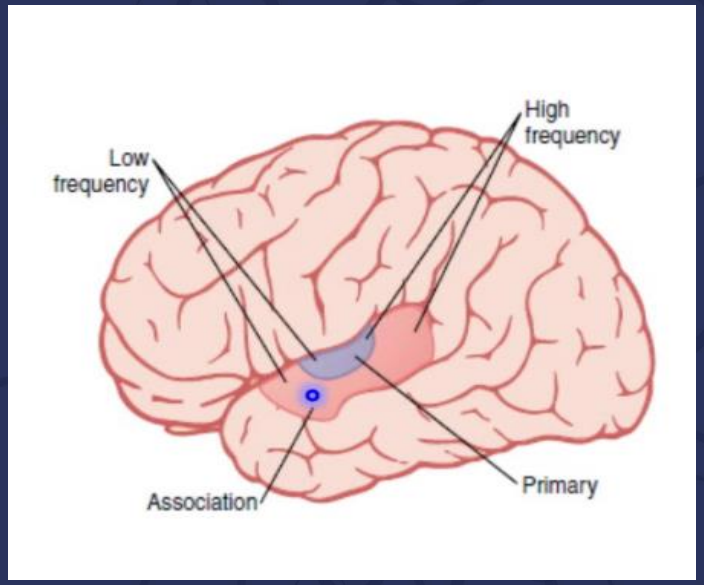


Recognition on the MOCA

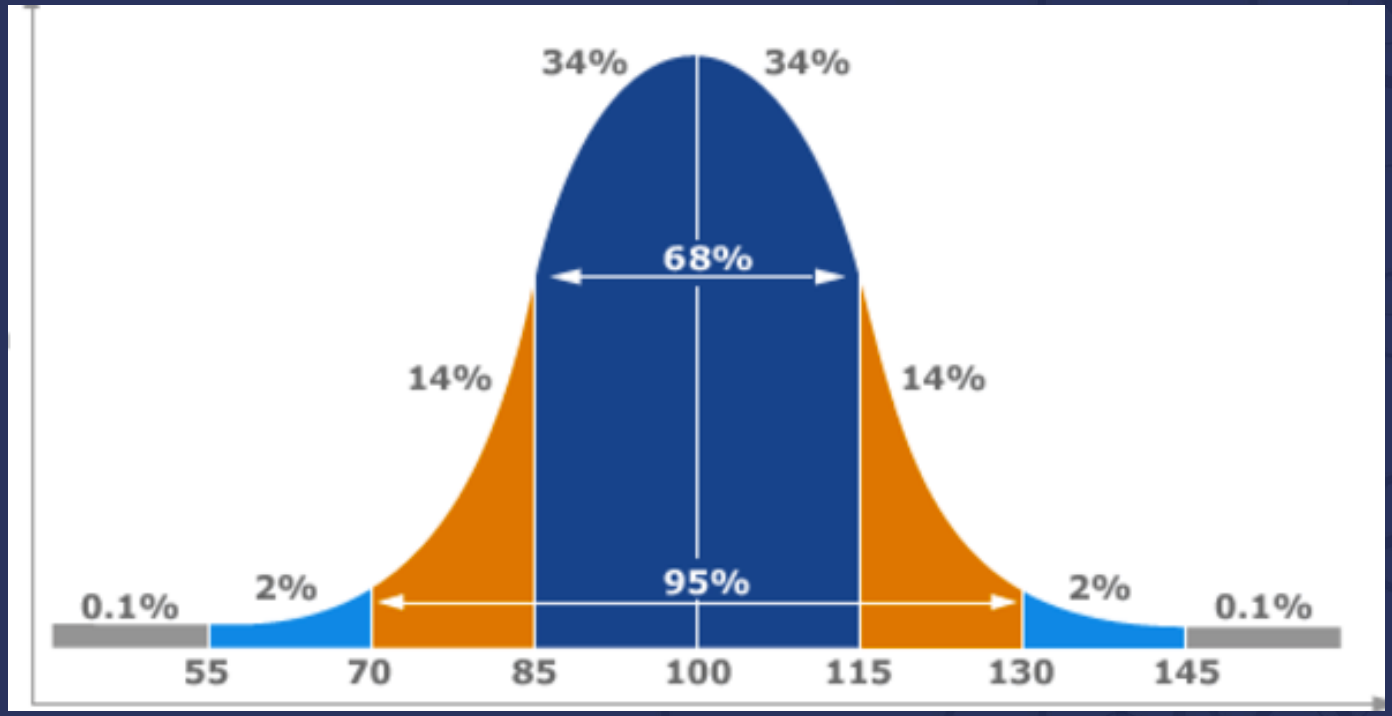


Where does recognizing sound happen?





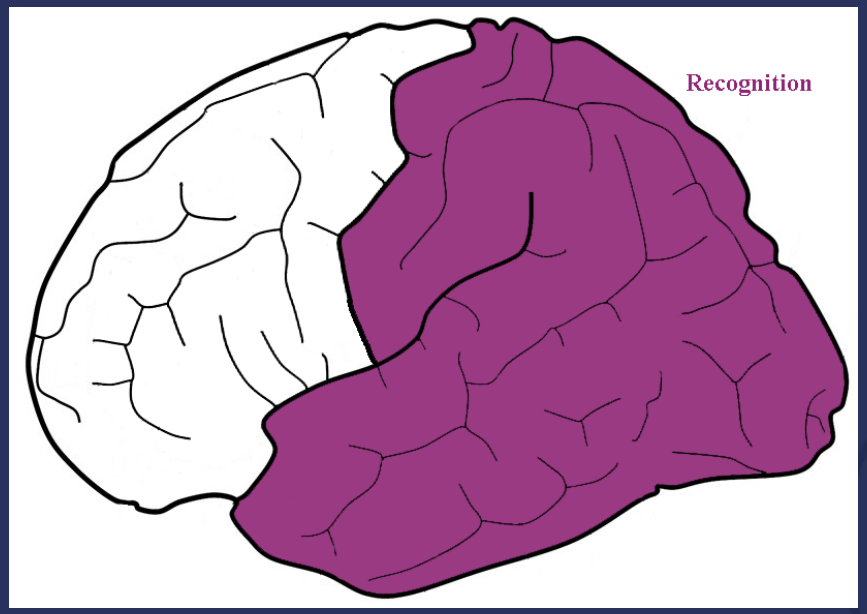
Where am I on the hearing spectrum?



It depends……

Aging has changed where I am on the spectrum

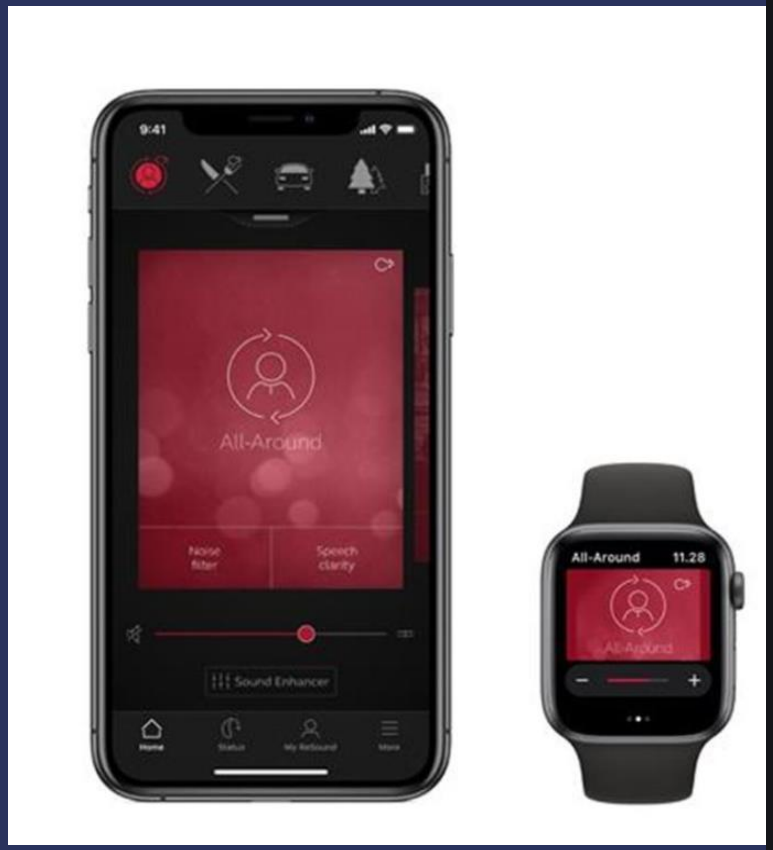
New Barriers to Learning: 1) hearing

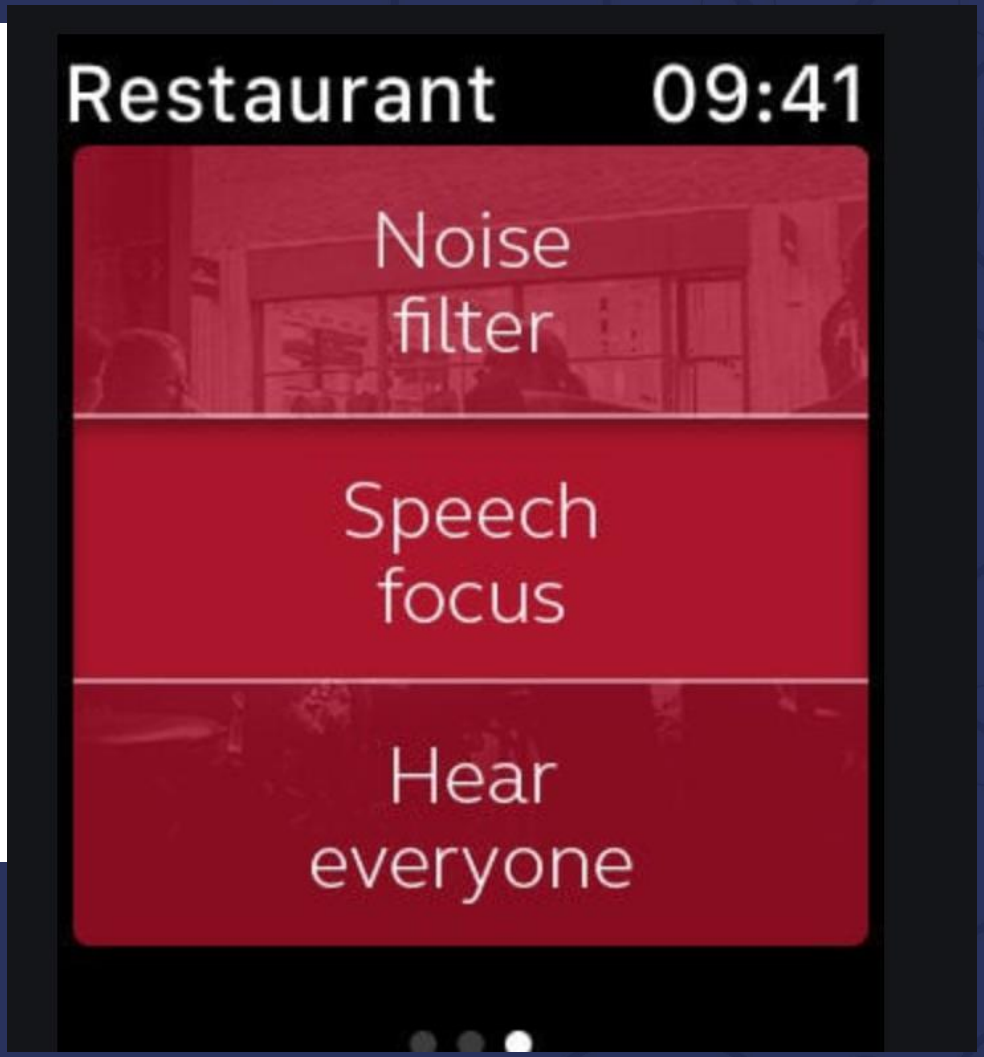


- NEUROLOGICAL EXAM
  MS: His language was fluent but slightly slow and hesitant. He scored a 25 out of 30 on the MOCA losing 1.4 trails, digit span back and 3 points for delayed recall. He named 12 words beginning with F, 16 animals with one repetition. Boston naming was 15 out of 15. On the I Boca he was 5 out of 5 on the visual association recall and recognition.
  CN: EOMI, PERRL, VFFTC, Face symmetrical. Tongue and uvula midline. Hearing intact.
  MOTOR: No drift. No adventitious movements. FFM and RAM are rapid. Full power throughout.
  SENSORY: Intact to LT
  DTR: Symmetrical throughout. Plantars are downgoing.
  COORDINATION: FFM, RAM, dysmetria, dysdidokokinesia.
  GAIT: Narrow based and steady.

New Technologies

Change where I am on the Spectrum






Back Spatial Configurator
Span
Back Spatial Configurator
Span
Back Spatial Configurator
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Back Spatial Configurator
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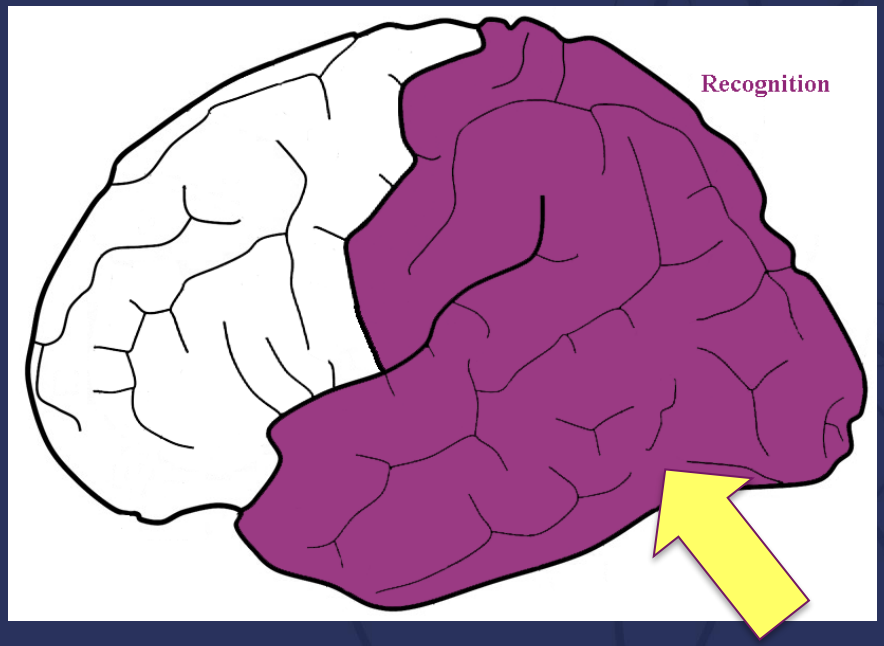
Back Spatial Configurator
Span

Remote control

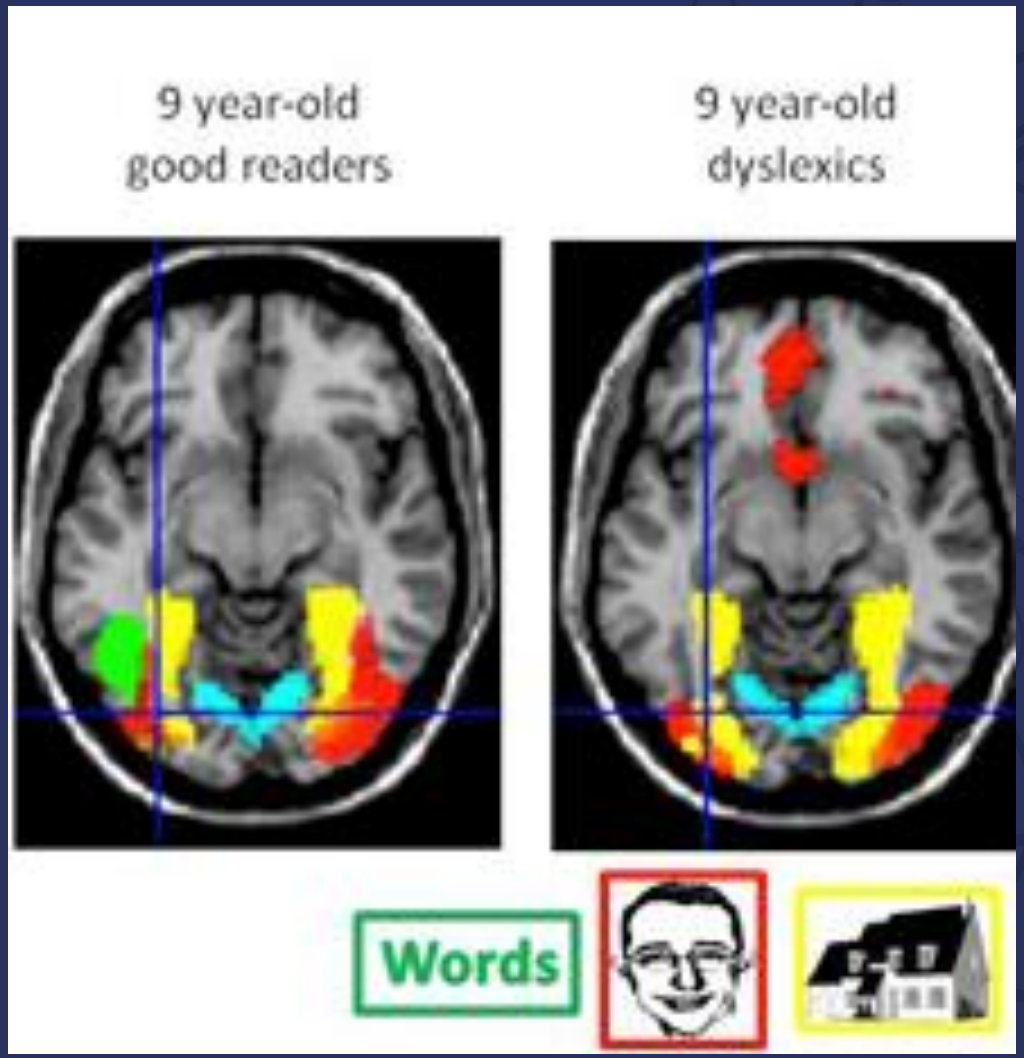
Directional hearing

Connectivity and streaming

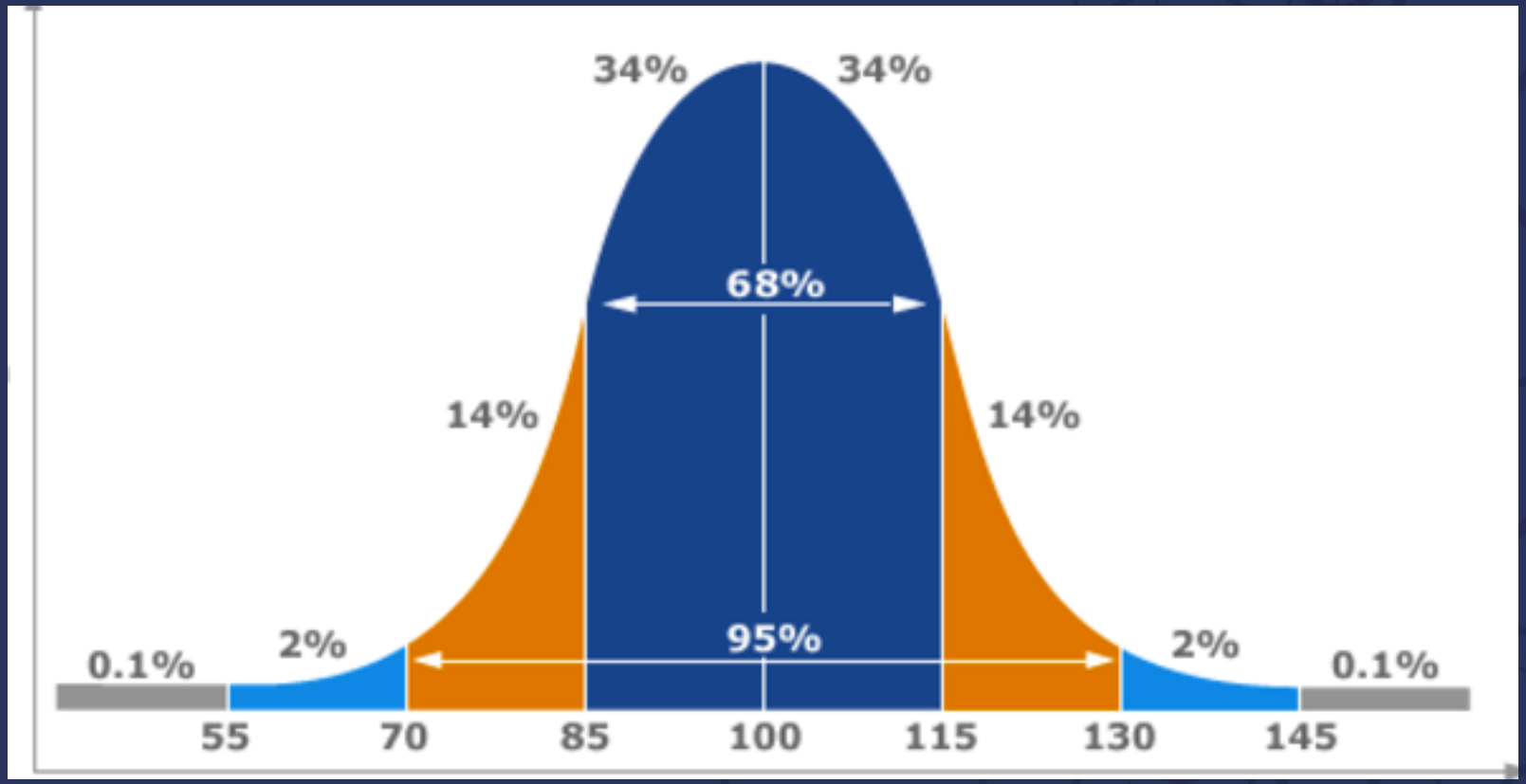


Word Recognition Area

Recognizing words in the Brain

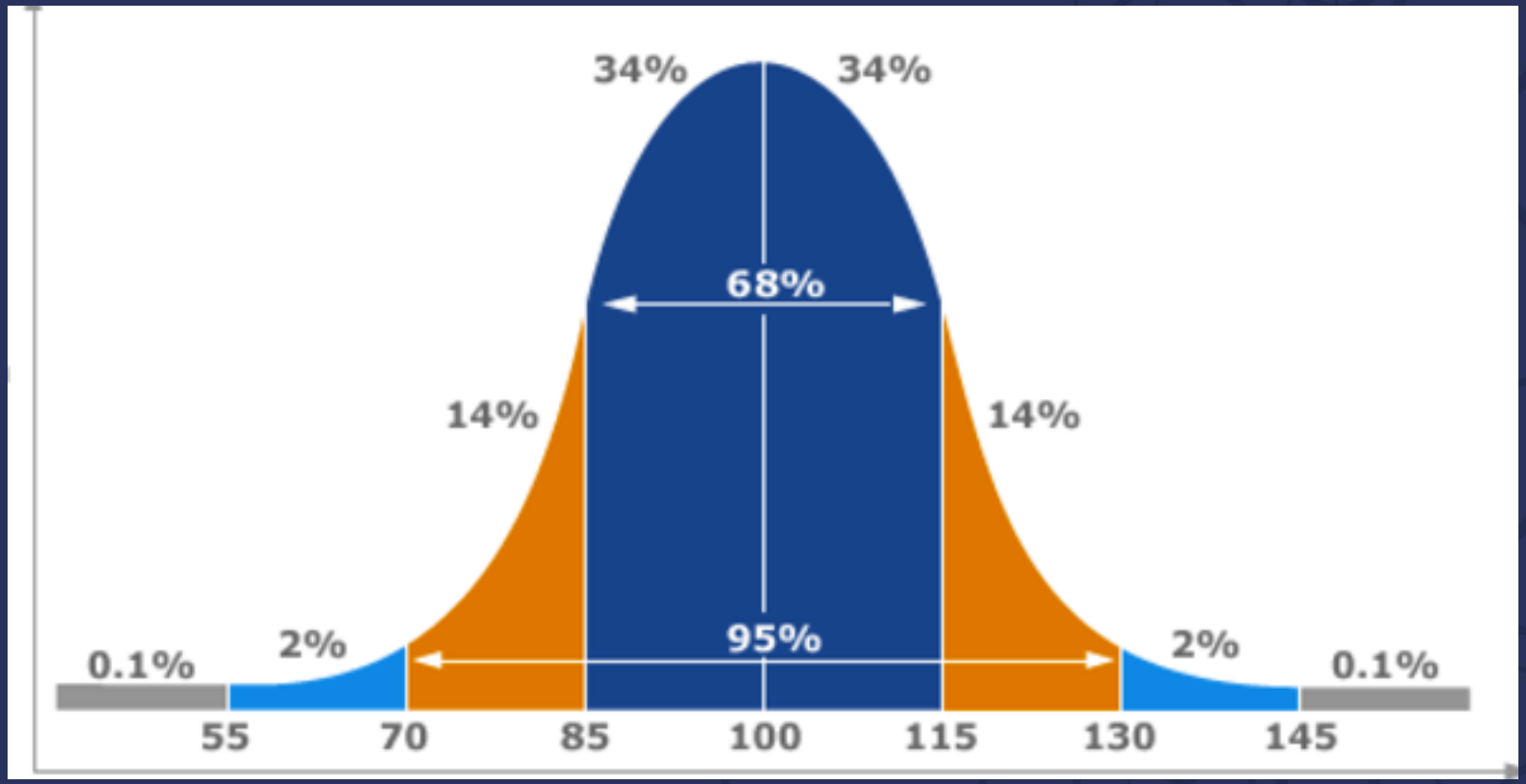


The “reading” Spectrum



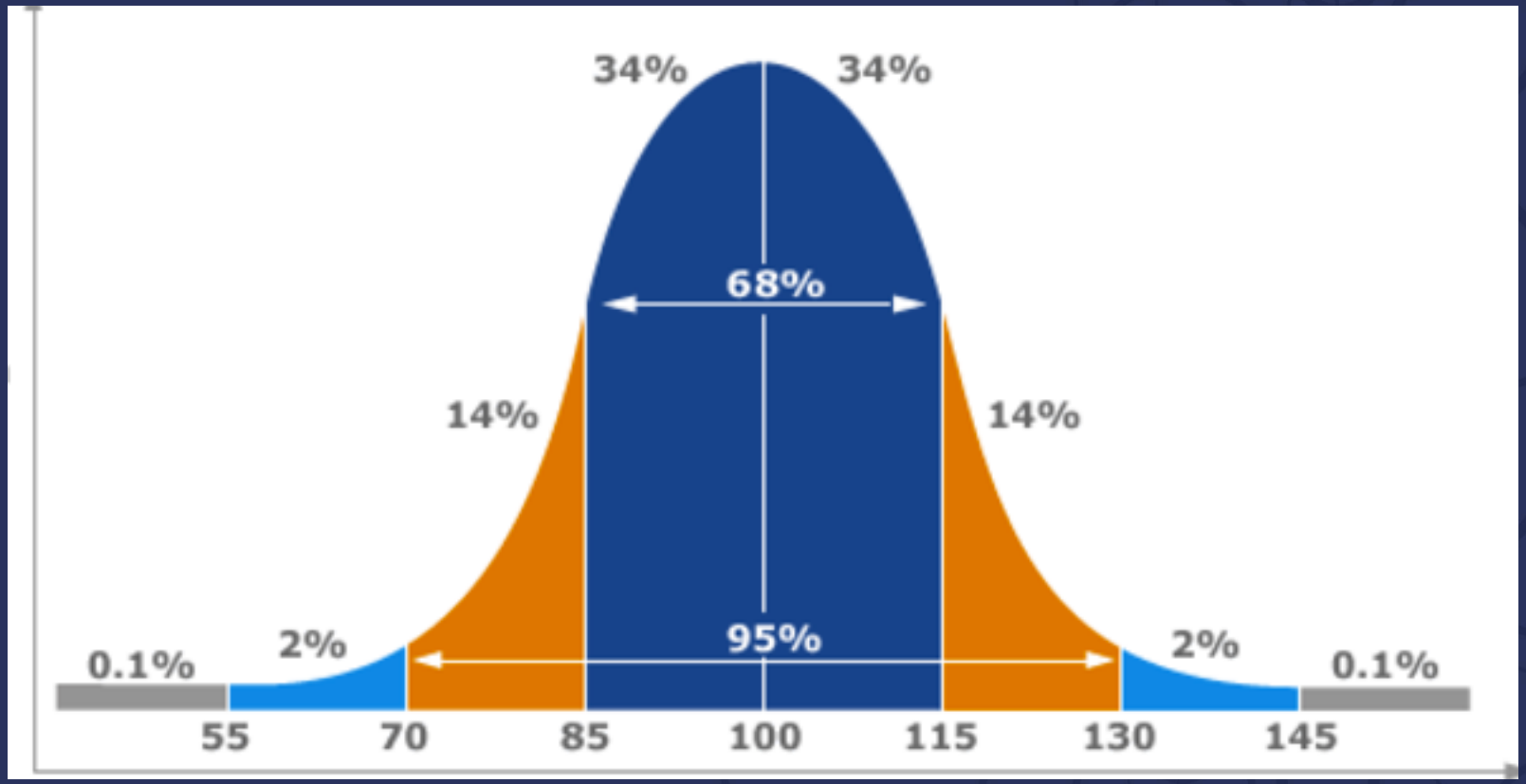
Hyperlexia Dyslexia Alexia

Who has a disability?

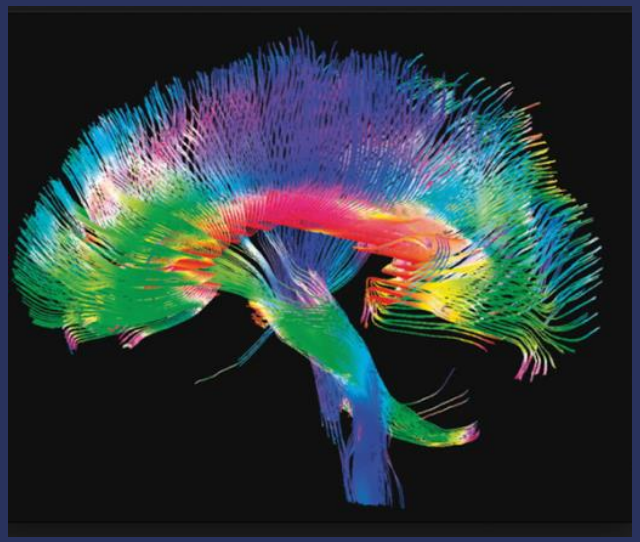


Hyperlexia Dyslexia Alexia

What to do about diversity in reading?



Hyperlexia Dyslexia Alexia



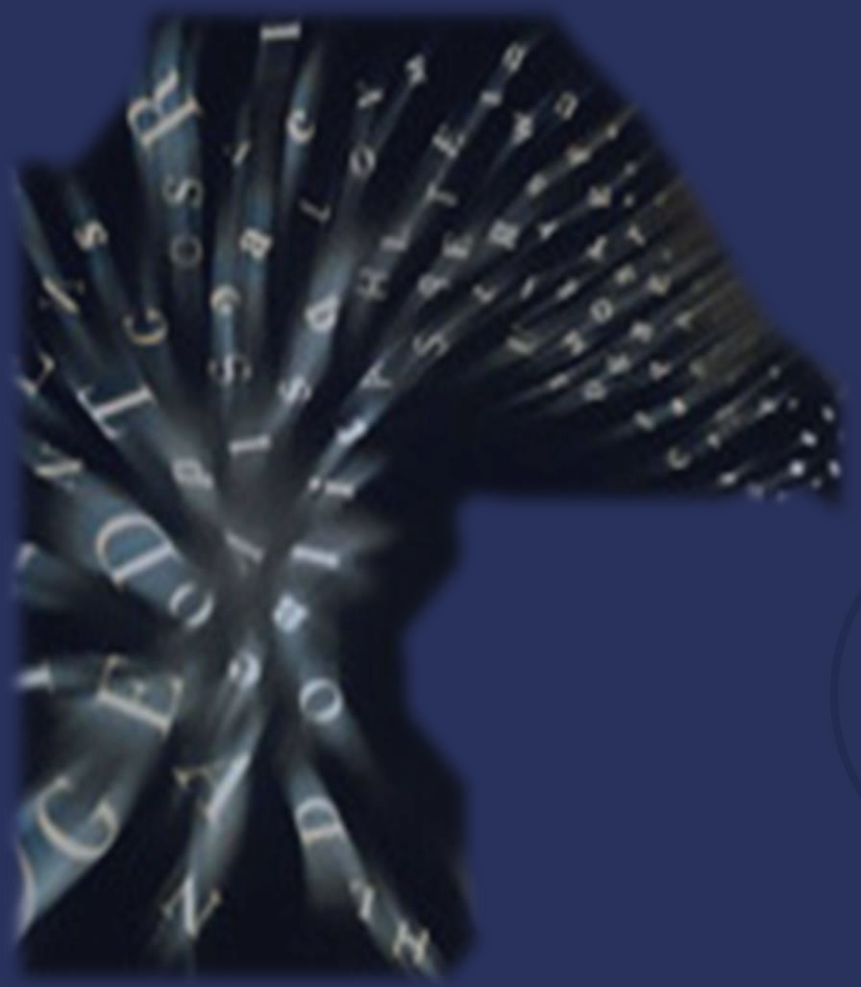
Advances in learning sciences

Advances in learning technologies

How have new technologies changed reading?

Advances in Learning Technologies
A Foundation for Flexibility

Flexible Display



A Tale of Two Cities

It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of

A Tale of Two Cities

It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season

दो शहरों की कहानी

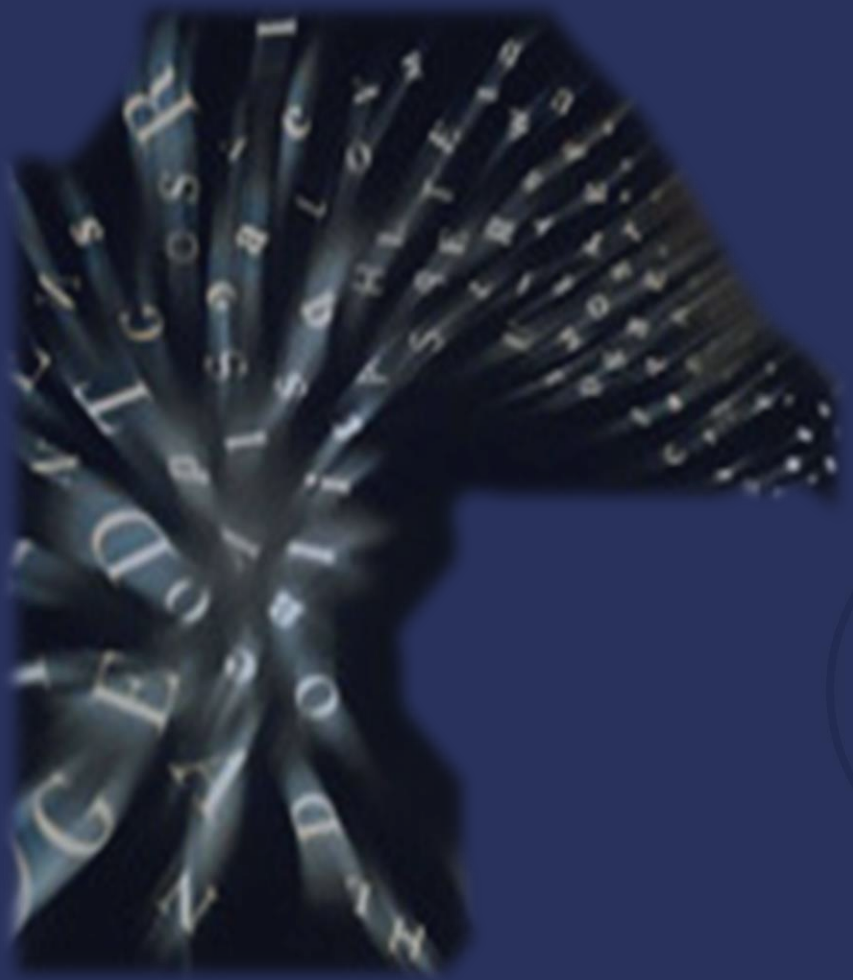
यह समय का सबसे अच्छा था, यह समय का सबसे बुरा था, यह ज्ञान की उम्र थी, यह मूर्खता की उम्र का था, यह विश्वास का युग था, यह अविश्वास का युग था, यह मौसम का था

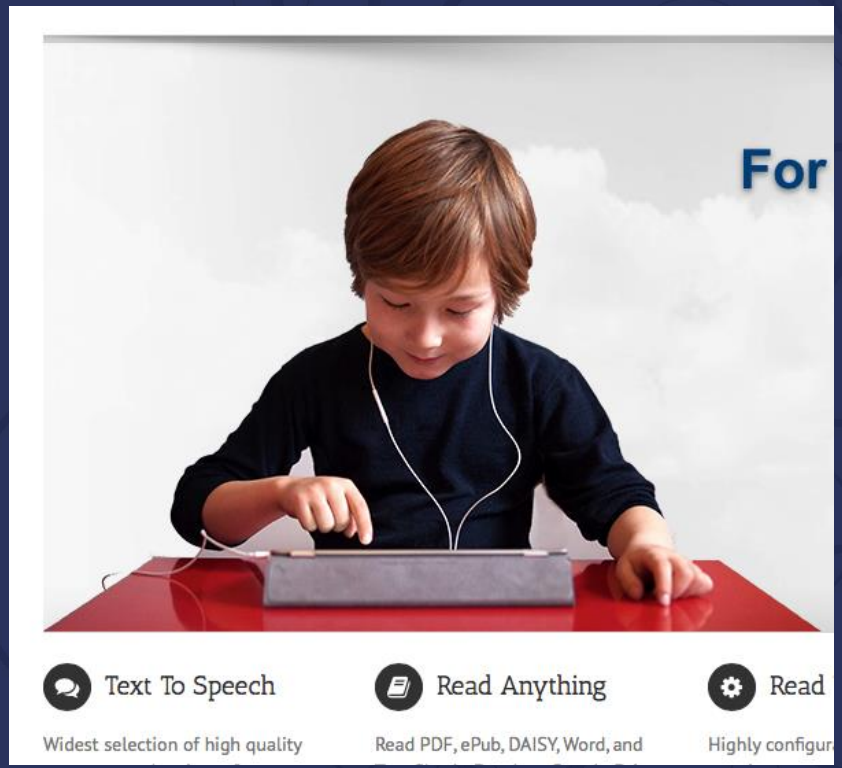
Flexible Display: Multiple Representations

A Tale of Two Cities

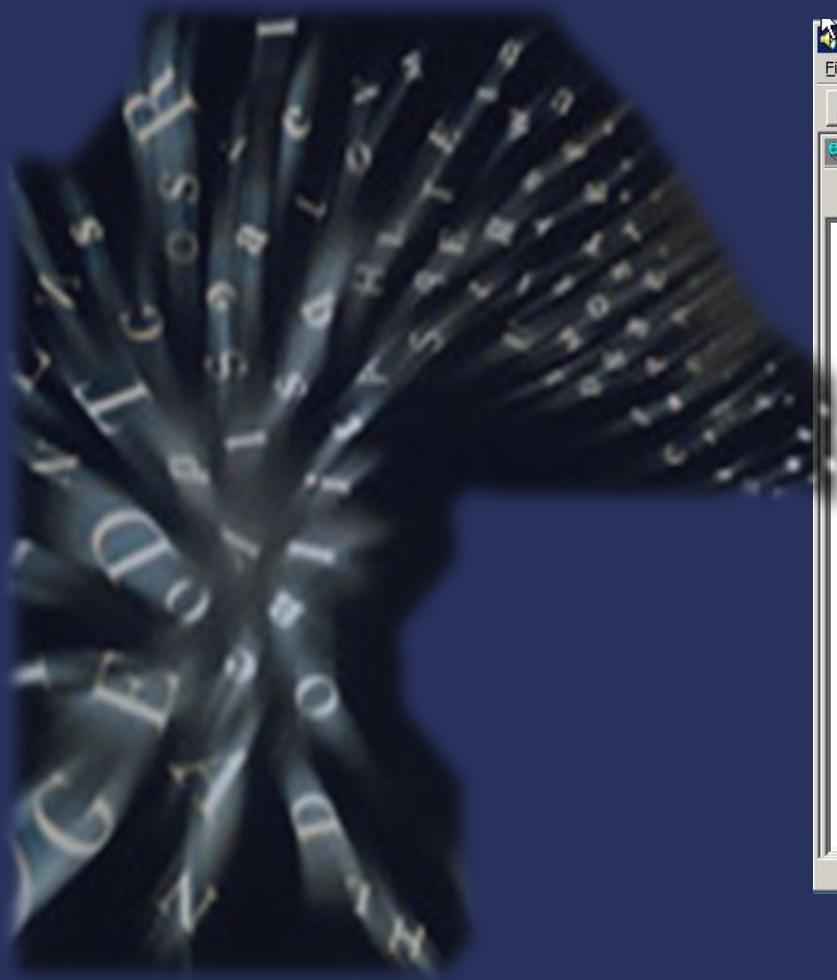
It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of

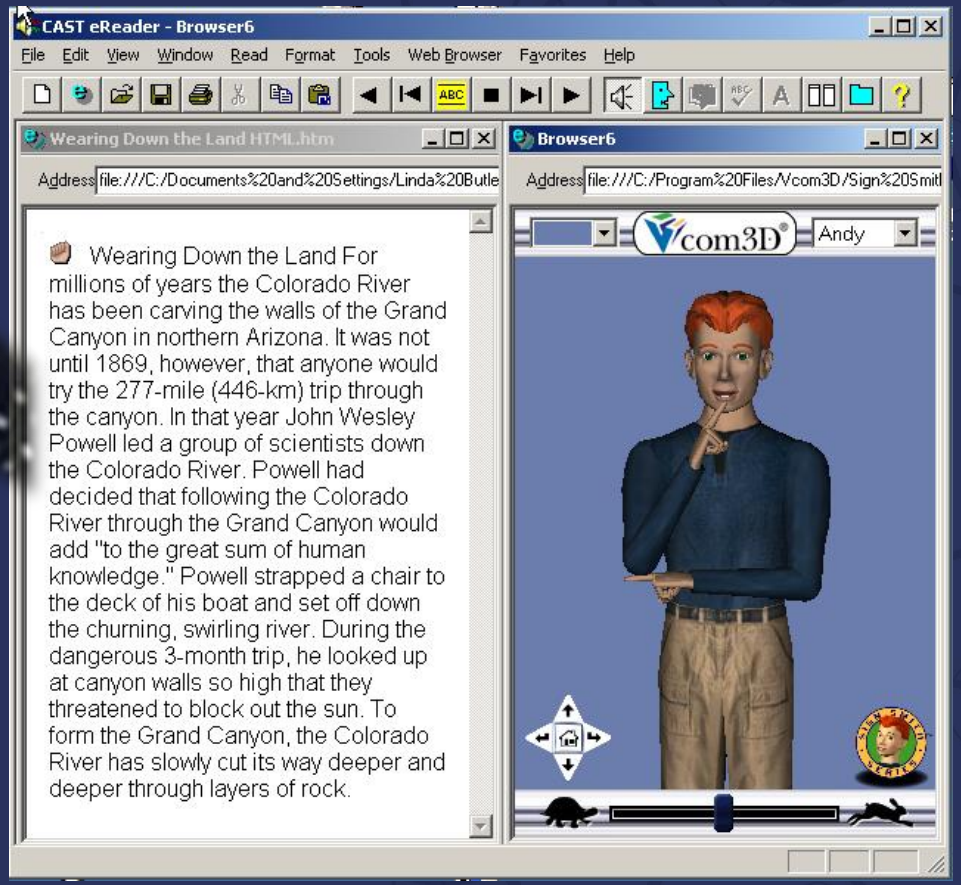
Flexible Display: Multiple Representations





Flexible Display:
Multiple Representations





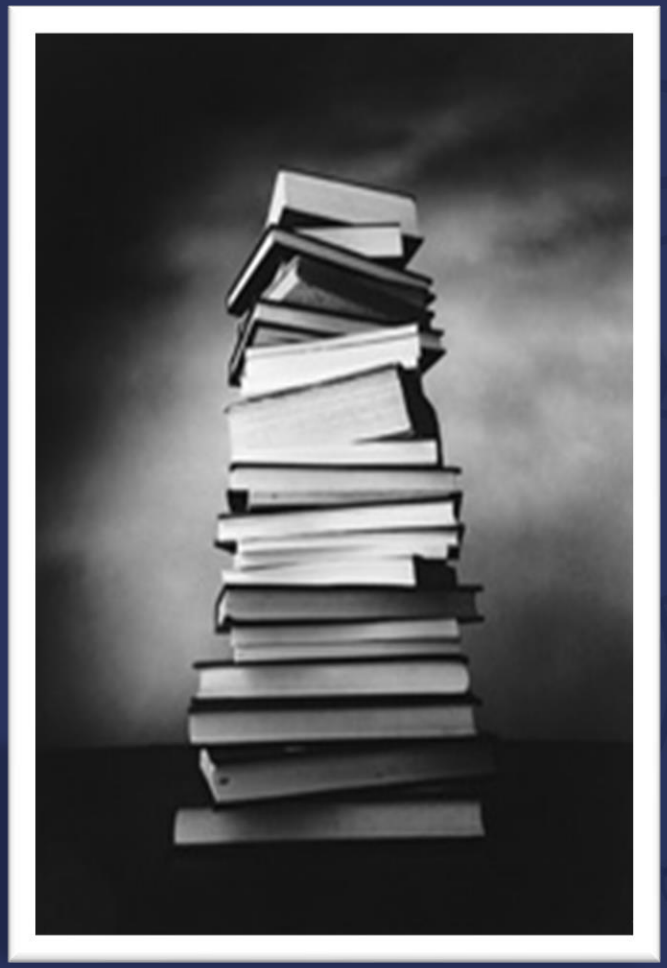
Schools need to make learning materials universally accessible
Nov. 17, 2019 Seattle Times

I'm a college sophomore and I haven't read a print book since eighth grade.

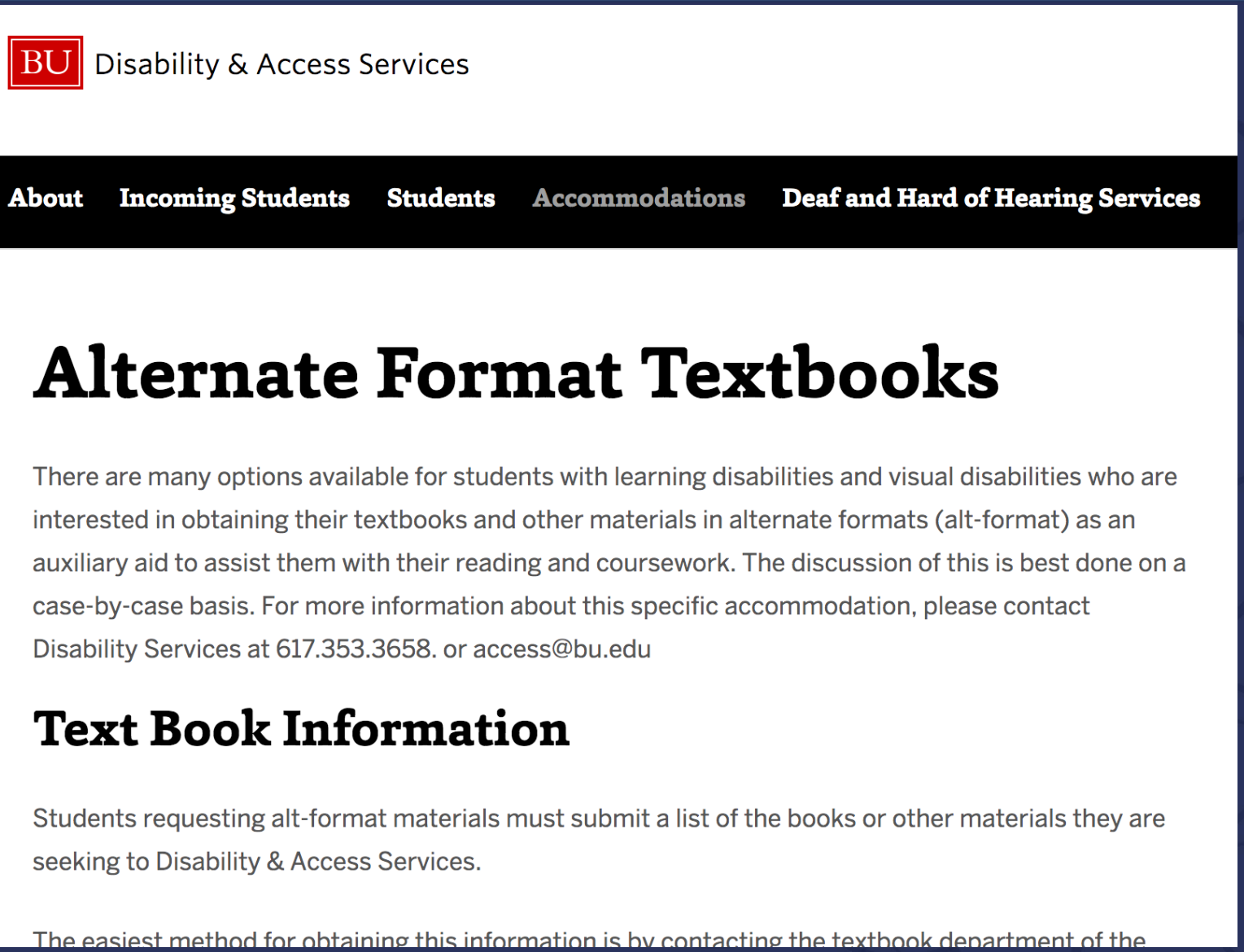
What are the downsides of remediation?

Federal NIMAS Legislation

The National Instructional Materials Accessibility Standard



…addresses the national need to increase the availability and timely delivery of print instructional materials in accessible formats to blind or other students with print disabilities in elementary and secondary schools.



BU Disability & Access Services

About | Incoming Students | Students | Accommodations | Deaf and Hard of Hearing Services

Alternate Format Textbooks

There are many options available for students with learning disabilities and visual disabilities who are interested in obtaining their textbooks and other materials in alternate formats (alt-format) as an auxiliary aid to assist them with their reading and coursework. The discussion of this is best done on a case-by-case basis. For more information about this specific accommodation, please contact Disability Services at 617.353.3658. or access@bu.edu

Text Book Information

Students requesting alt-format materials must submit a list of the books or other materials they are seeking to Disability & Access Services.

The easiest method for obtaining this information is by contacting the textbook department of the

https://www.bu.edu/disability/accommodations/procedures/specific/alternate-format-textbooks/

BU Alumni Medical Library

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E-Books

Medical Library E-Books List

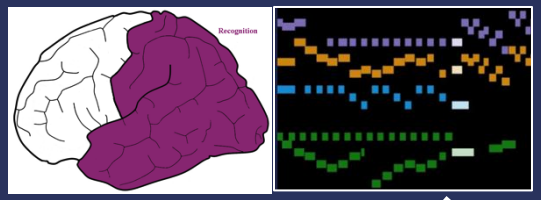
The Medical Library e-books list collects a subset of Boston University electronic books of particular relevance to medical and health topics. The list is searchable by book title, author and subject.

Also see our list of popular electronic book packages, below, to search for specific information in a number of books at once.

Medical Library E-Book Packages

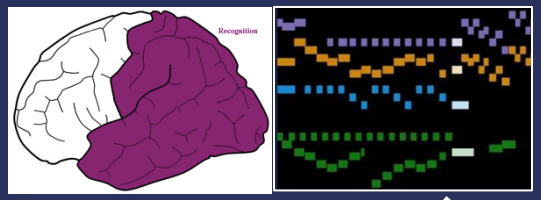
- AccessMedicine (McGraw-Hill, AccessLange)

Making Lectures More Universal



I. Provide Multiple Means of Representation
Perception
Language, expressions, and symbols
Comprehension

Making Lectures More Universal



I. Provide Multiple Means of Representation
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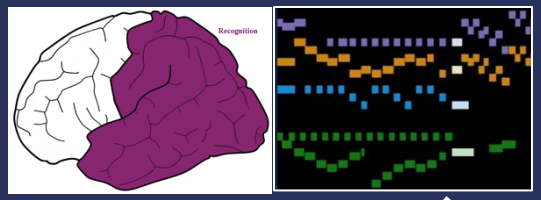
Accessible Multimedia Slides (posted before class)

Full video (captioned) available on the web 24 hours later

Crowd-sourced note-taking

Making Lectures More Universal



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March 1: Individual Differences in Neural Networks (2)
Topic: Strategic Networks and Executive Function
Notes compiled by Michelle Berkovitz

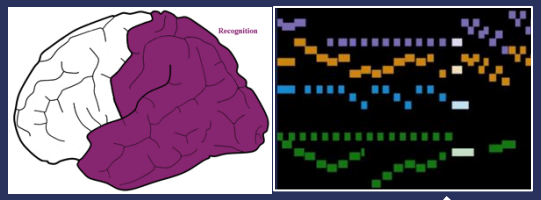
Ruth as an example of individual differences:

- She has perfect pitch.
- Studies have shown that people with a perfect pitch have an enlarged area devoted to perfect pitch right along the temporal auditory cortex.
- There's a very large area on the left side, but small area on the right side devoted to perfect pitch, which seems to be characteristic of people who have perfect pitch.
- A person with perfect pitch can identify a pitch as exactly b-flat, for example. They automatically code in pitches rather than melodies (as most people do).
- People with perfect pitch are oftentimes musicians. In most cases, this characteristic is an asset to the music profession.
- Most people are able to recognize relative pitches, their patterns, but not their absolute pitch.
- Ruth would see Professor Rose as disabled in not having this ability.
- Context is everything! A person's disabilities can be seen as an interface with their context.
  - For example, when in Church, Ruth will just not sing because fighting against the incorrect pitches that others are singing is too frustrating and overwhelming.
- Is perfect pitch all biology? All learning? It's very difficult to tell.
  - Studies have shown that if people with perfect pitch are not living in an environment or culture where pitch is important, this skill will decline or be lost. Conversely, in cultures that value pitch, these skills are found to have an even more elevated perfect pitch.

Strategic Networks

- In schools we tend to be more concerned with children's abilities to act strategically.
- Victorian Picture from first day of class – Eye movement recordings indicate the different strategic plans we use when looking at images.
  - Why are these plans so different?
    - You make a strategy depending on the question. Questions like: How are the people related? When does this scene take place?

Making Lectures More Universal



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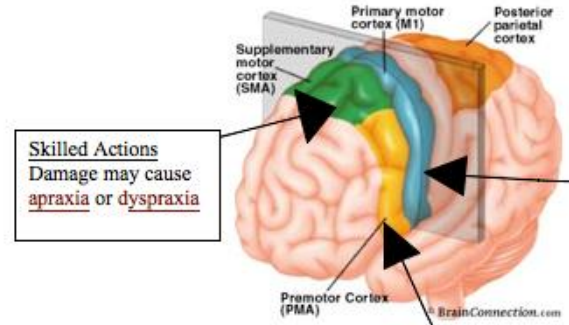
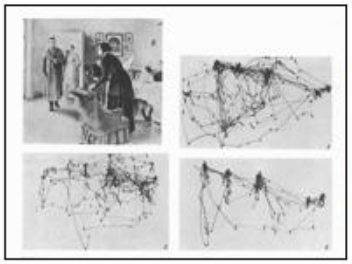


Skilled Actions
Damage may cause apraxia or dyspraxia

Intentional Actions
Primary Motor Cortex – neurons run down the spine; damage may lead to paralysis

Strategic Actions
Premotor cortex
For organized/planned movement or systems of movement

Strategic Action Example: Involving the Visual, Motor, and Prefrontal Cortex



Remember looking at the picture at left in class? The other line-dot pictures are recordings or mappings of a person looking at the same picture. Why the different 'looking strategies?' Because of the different 'contexts' in which the person was asked to look at the picture. (i.e. *How many people are in the photo?* vs. *What kind of room is it?*).

What about an infant's looking strategies?

This is a baby at one month (top) and two

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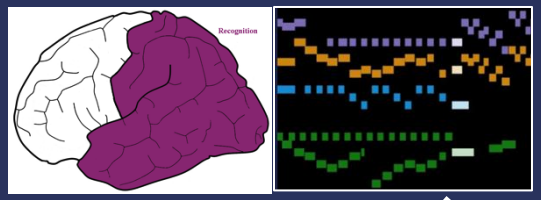

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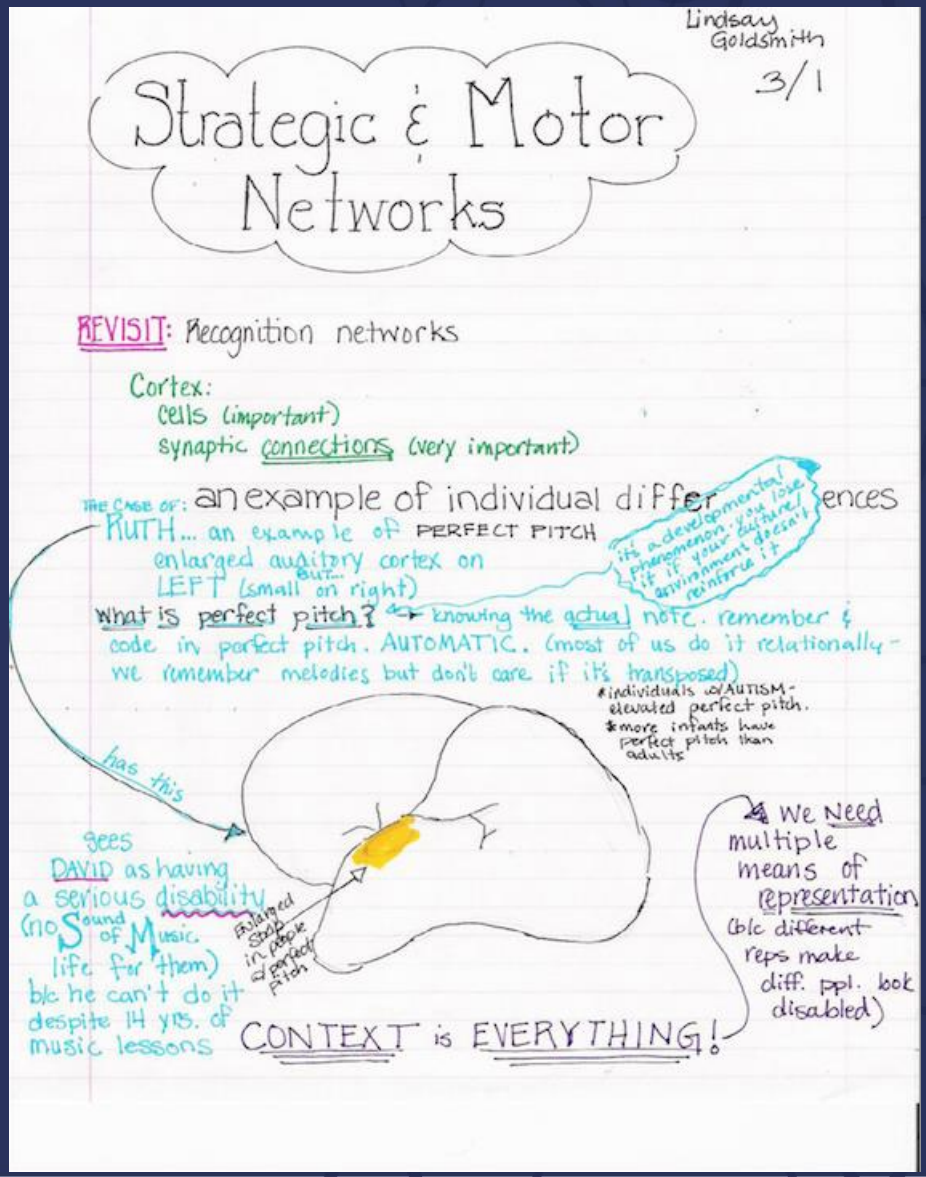

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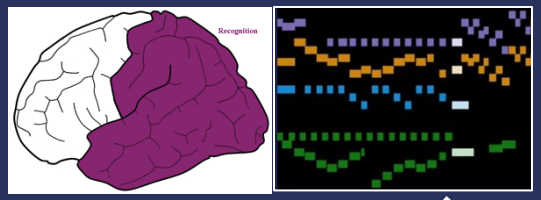

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Lecture Notes for February 14, 2006 – Valentine's Evening

The Author

Hi. My name is Chris. In case you missed it, or simply want to relive it – here's what happened on Tuesday night:

I am wearing a blue shirt. It's from the State of New Jersey - Department of Central Services. I stole it form my mom's laundry basket. I also am wearing jeans and new boots.

Dr. Rose enters the room at 7:02 pm.

I am seated next to Kati Blair. She wears a black top with green pants. And glasses. And a bracelet. And she holds out her necklace, and pulls out a green undershirt.

Kati

Kati asks me for gum. She's out of luck.

It is 7:05.

Kati says, "I forgot we are doing something fun."

Sam sets a bag down on the desk across from me. I suspect here are treats in this bag. Because it looks like there are a bunch of two liter bottles of something green.

Maia has been asked to move to the seat next to me.

Carolina

Carolina takes a picture. Perhaps she is taking notes as well. I have no camera. Yes I do!!! My cell phone!

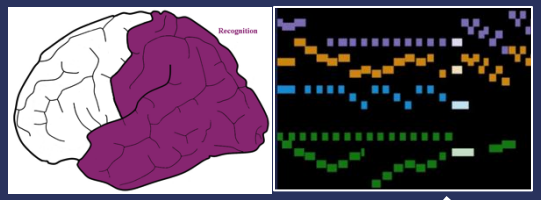
We begin. It is 7:09.

The Sams are arranging people. It is mysterious. Dr. Rose says to make nametags. There is shuffling and ripping.

There will be drinking involved in tonight's activity, I think. People are passing out cups and opening soda. Kati puts away here laptop and now I am worried. I'd hate to spill Sierra Mist on my Mac.

Dr. Rose: "We are gonna talk about what neural networks are, how they operate." He noticed it was hard to teach neural networks when he first started teaching about them.

Making Lectures More Universal



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Sweet Neuron Nectar

The three sections of Larsen G08 are divided into three layers of neurons. The left side of the class is output. The middle section is the middle layer. The right side is input. We will model neurons. However, the best way to do it would involve spitting on each other. The way it would work is that I would spit at other neurons and get them worked up so they fire. Firing happens when we receive enough stimulus to excite our axons. Instead of spitting, we raise our arms and wiggle our hands.

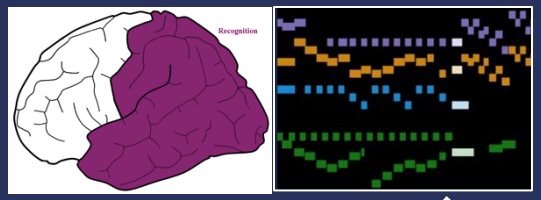
(There is computer trouble. Dr. Rose doesn't know his password. I am tempted by my Schweppes. But I shouldn't drink. The computer problem is solved.)

We learn that there is constant neural firing going on in our brains. Constantly. It's like background noise. We practice random firing. We giggle. (For tonight's experiment we will reduce background firing.) Any change in this firing is information – an increase, a decrease ~~it~~ reflects a change in the Nervous System's state. Neurons make information by decreasing or increasing their firing.

Tonight, we will only fire when irritated.

Normally, as a network, we all would be connected (a typical neuron has 10,000 connections).

Making Lectures More Universal



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Class notes
3/22/05

- Begins speaking of condition where thin layer of cortex/brain surrounds empty space: Orange Rind syndrome. Even with O.R., brain may operate with surprising efficiency. Drs. had expected severe disabilities.
- Brain is integrated and adaptive, to a large degree, can compensate and adjust to deficiencies.

"I don't know how to tell you this, but it looks like you have a brain the size of a seafood."

- Build-up of Cerebral-Spinal Fluid can cause problems for developing brain, e.g., hydrocephalus.
- Important question: What are strengths in face of recognized weaknesses?
- Dx is not an exact science in all cases.

"What about that! His brain still uses the old vacuum tubes."

- David read Auden poem (anti-war message): Ode to the Diencephalon
- Discussion of doctoral thesis study of children with only right or [redacted]
- Children functioning surprisingly well.

"Mama and I fixed a lovely dinner. I used the right side of my brain, and she used the left side of her brain."

- Some otherwise compromised compensate by developing advanced prosodic recognition. Child w/right brain only very superior abilities.

Bob Gibbons,
Sloan School of Management
MIT

No readings.

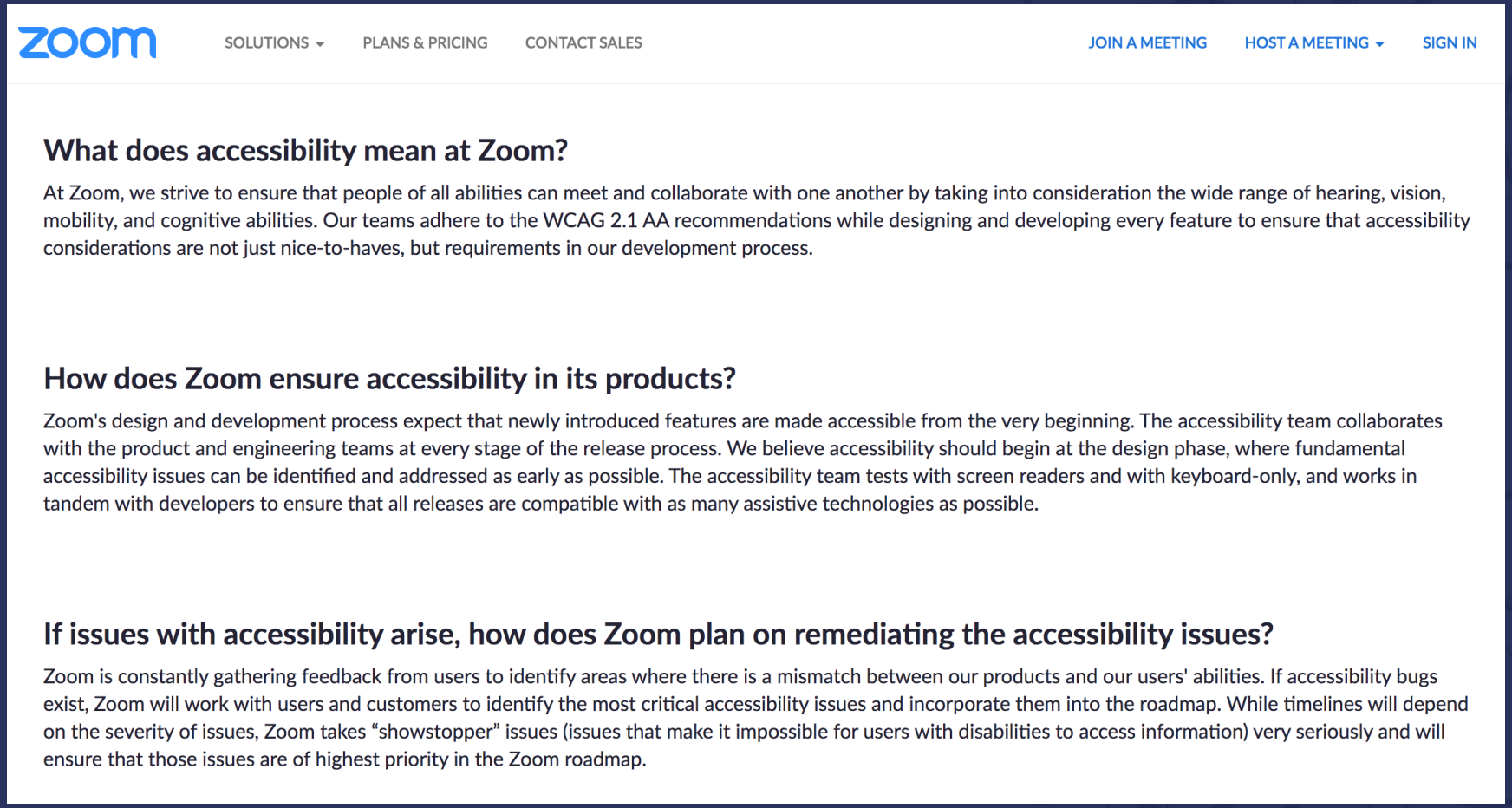
Before Class: Short Video Lectures posted

- For each video, discussion question added
- Students answer half the questions
- Short answers, 24 hours ahead.

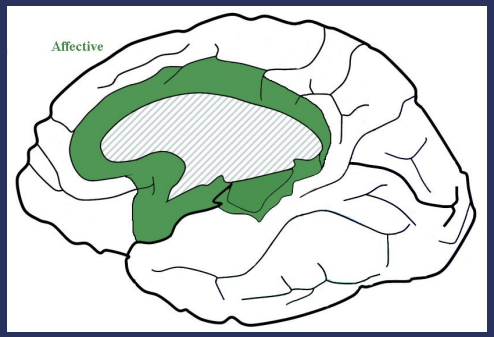
During Class:

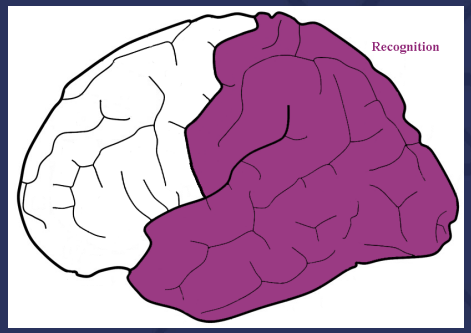
- Prof. picks some answers to discuss,
- Sets up an order for best discussion
- Benefit: Both student and teacher have time to reflect and plan ahead

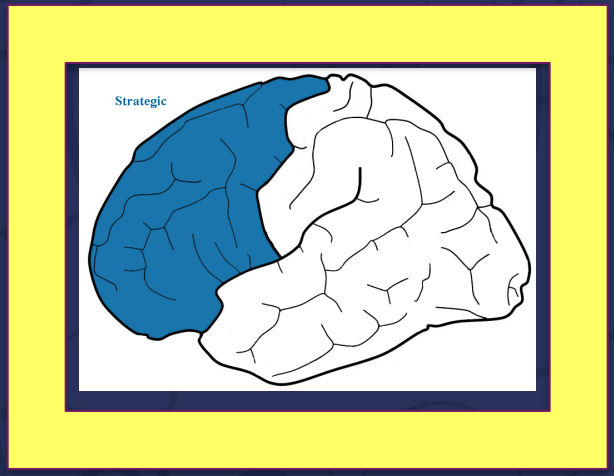
Zoom


zoom
SOLUTIONS
PLANS & PRICING
CONTACT SALES
JOIN A MEETING
HOST A MEETING
SIGN IN
What does accessibility mean at Zoom?
At Zoom, we strive to ensure that people of all abilities can meet and collaborate with one another by taking into consideration the wide range of hearing, vision, mobility, and cognitive abilities. Our teams adhere to the WCAG 2.1 AA recommendations while designing and developing every feature to ensure that accessibility considerations are not just nice-to-haves, but requirements in our development process.
How does Zoom ensure accessibility in its products?
Zoom's design and development process expect that newly introduced features are made accessible from the very beginning. The accessibility team collaborates with the product and engineering teams at every stage of the release process. We believe accessibility should begin at the design phase, where fundamental accessibility issues can be identified and addressed as early as possible. The accessibility team tests with screen readers and with keyboard-only, and works in tandem with developers to ensure that all releases are compatible with as many assistive technologies as possible.
If issues with accessibility arise, how does Zoom plan on remediating the accessibility issues?
Zoom is constantly gathering feedback from users to identify areas where there is a mismatch between our products and our users' abilities. If accessibility bugs exist, Zoom will work with users and customers to identify the most critical accessibility issues and incorporate them into the roadmap. While timelines will depend on the severity of issues, Zoom takes “showstopper” issues (issues that make it impossible for users with disabilities to access information) very seriously and will ensure that those issues are of highest priority in the Zoom roadmap.

Where do the three principles come from?

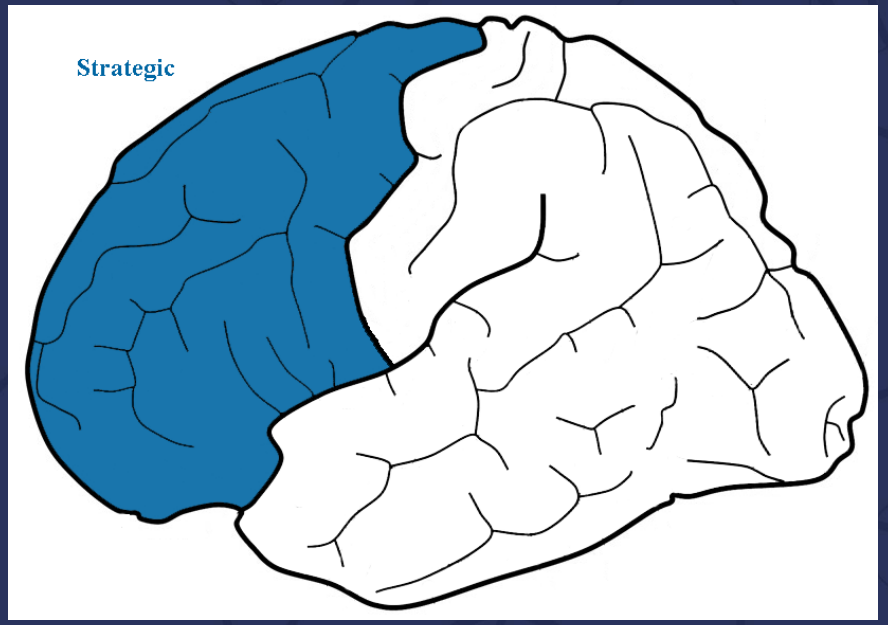




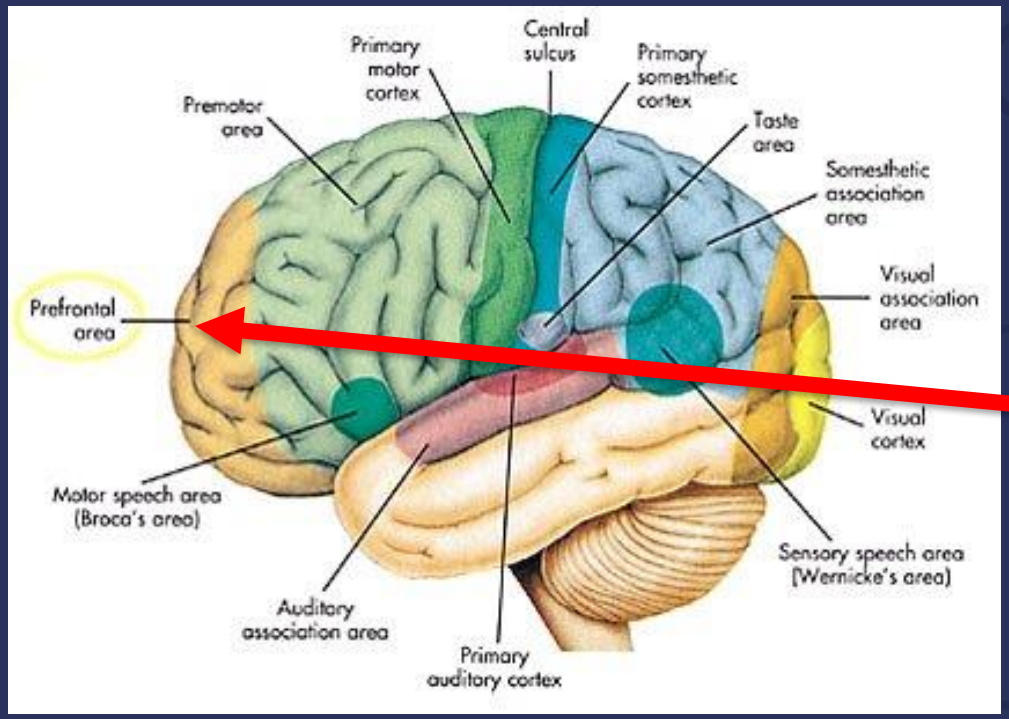


Strategic (Frontal) Cortex
How to DO that?

Planning, organizing and executing skillful actions in the environment

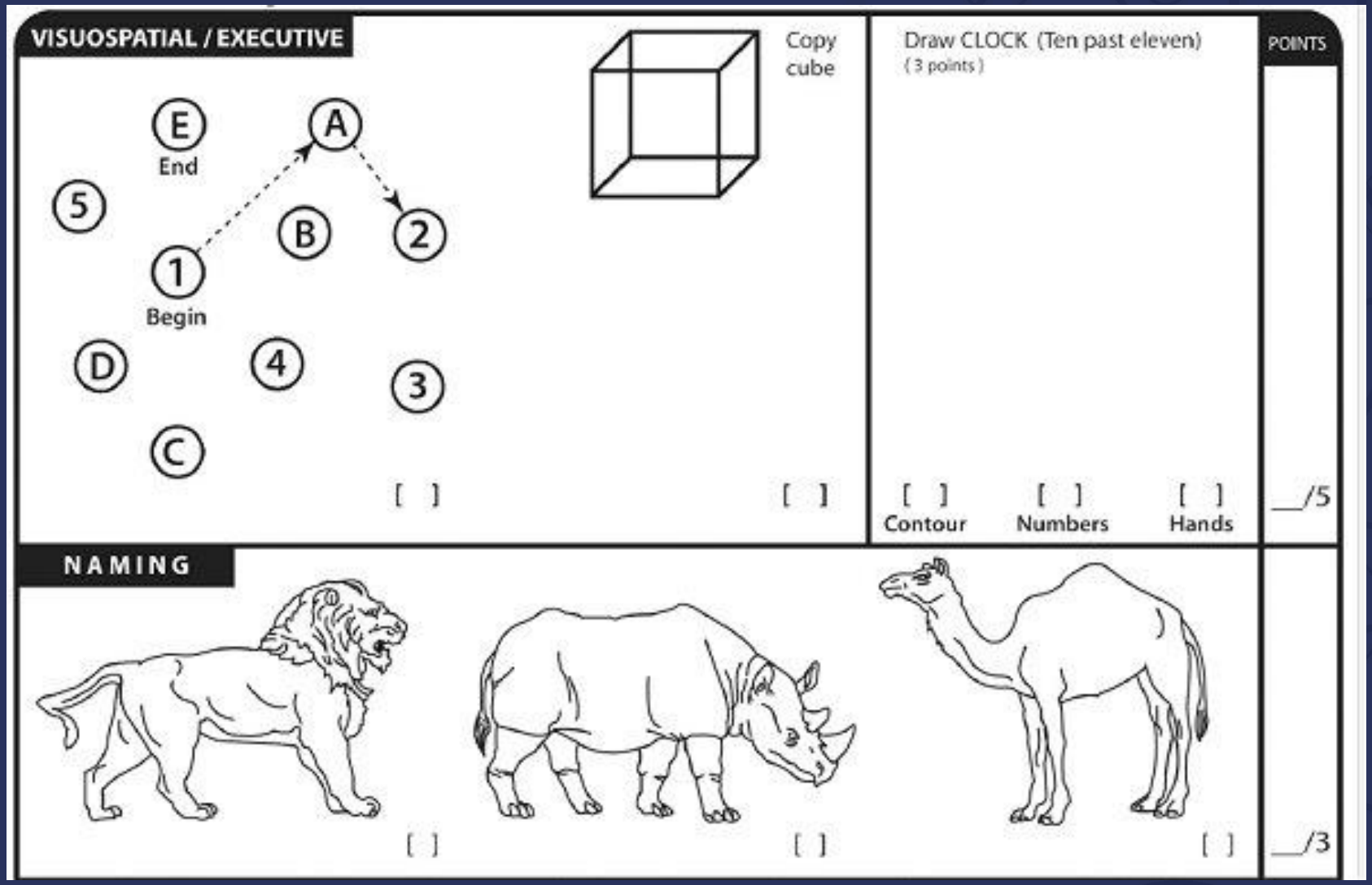


Late to Develop, Early to Degrade

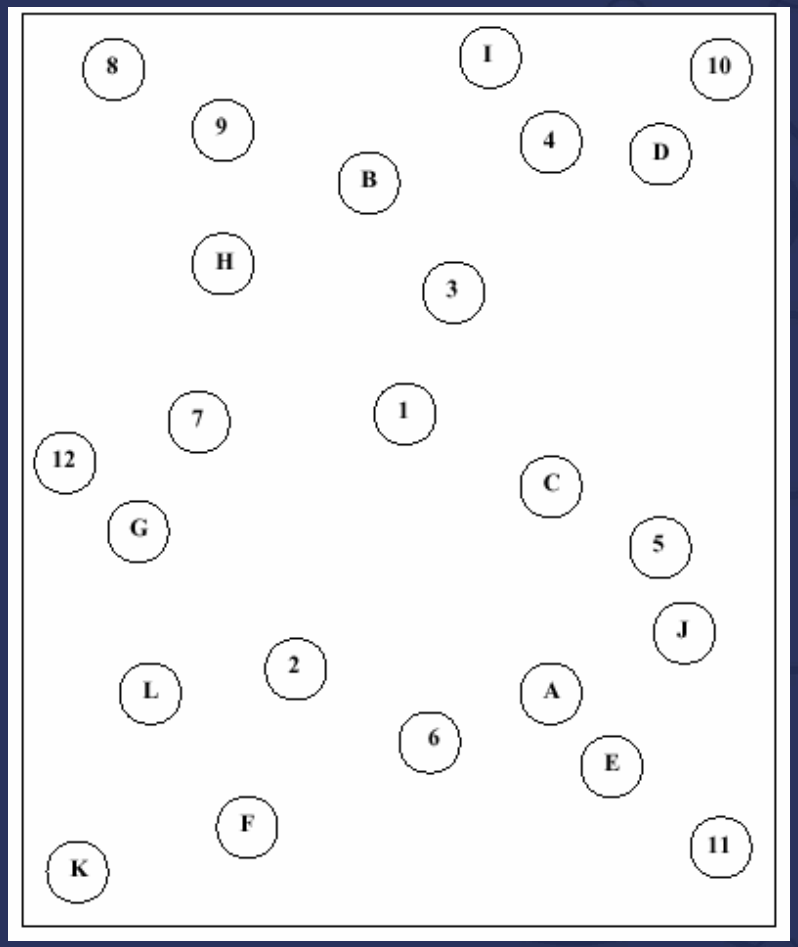


Executive Functions

Executive Function on the MOCA

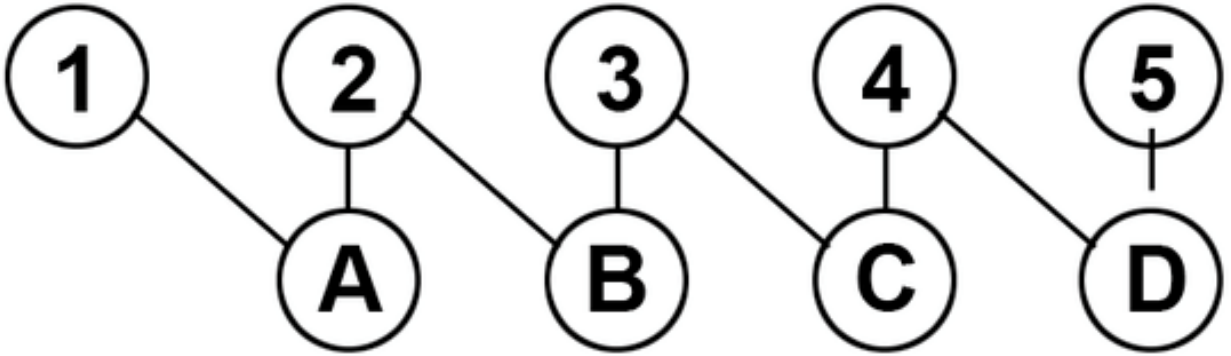


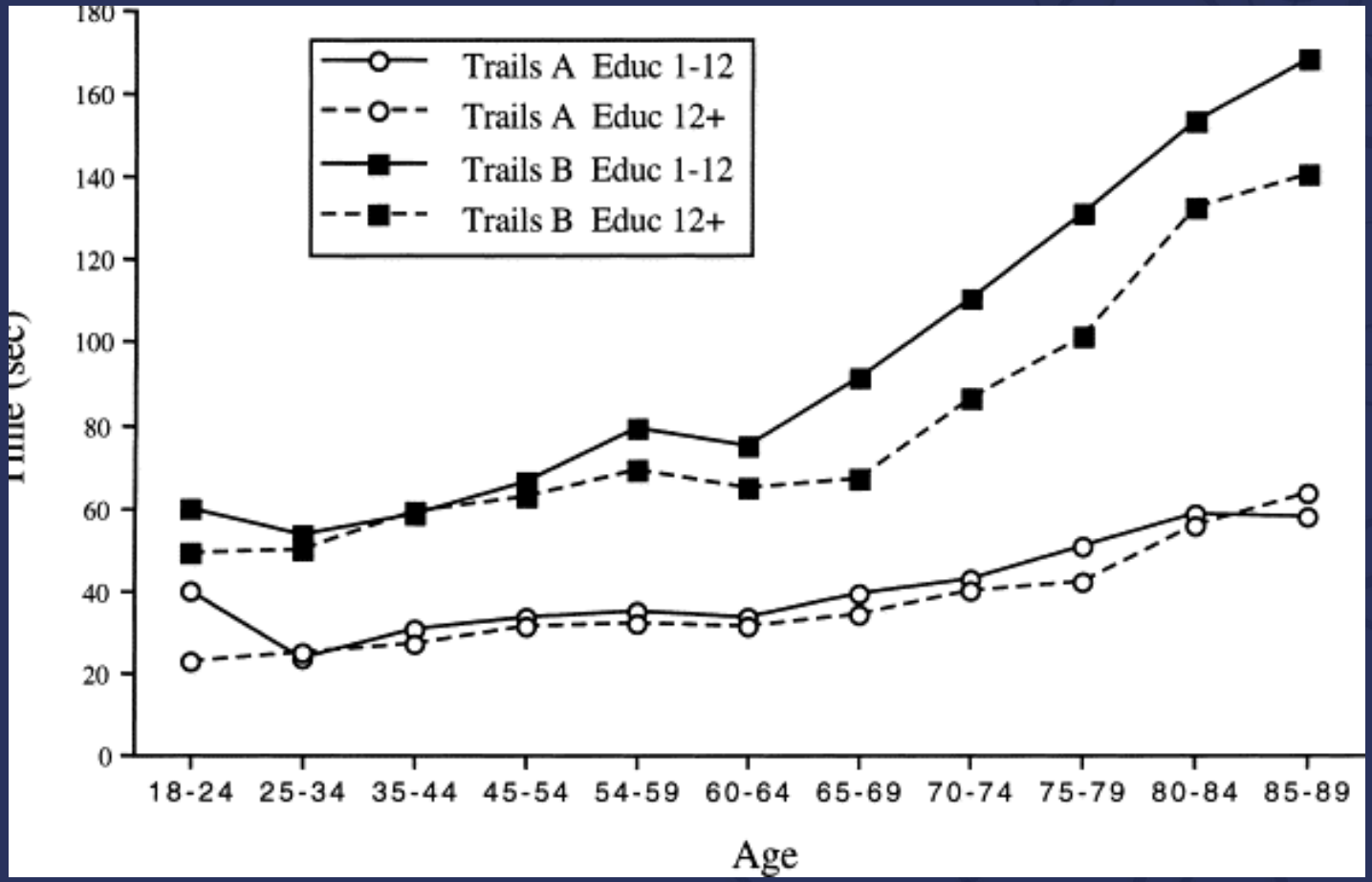
Trail Making Test Part B



a. Part A

a. Part B

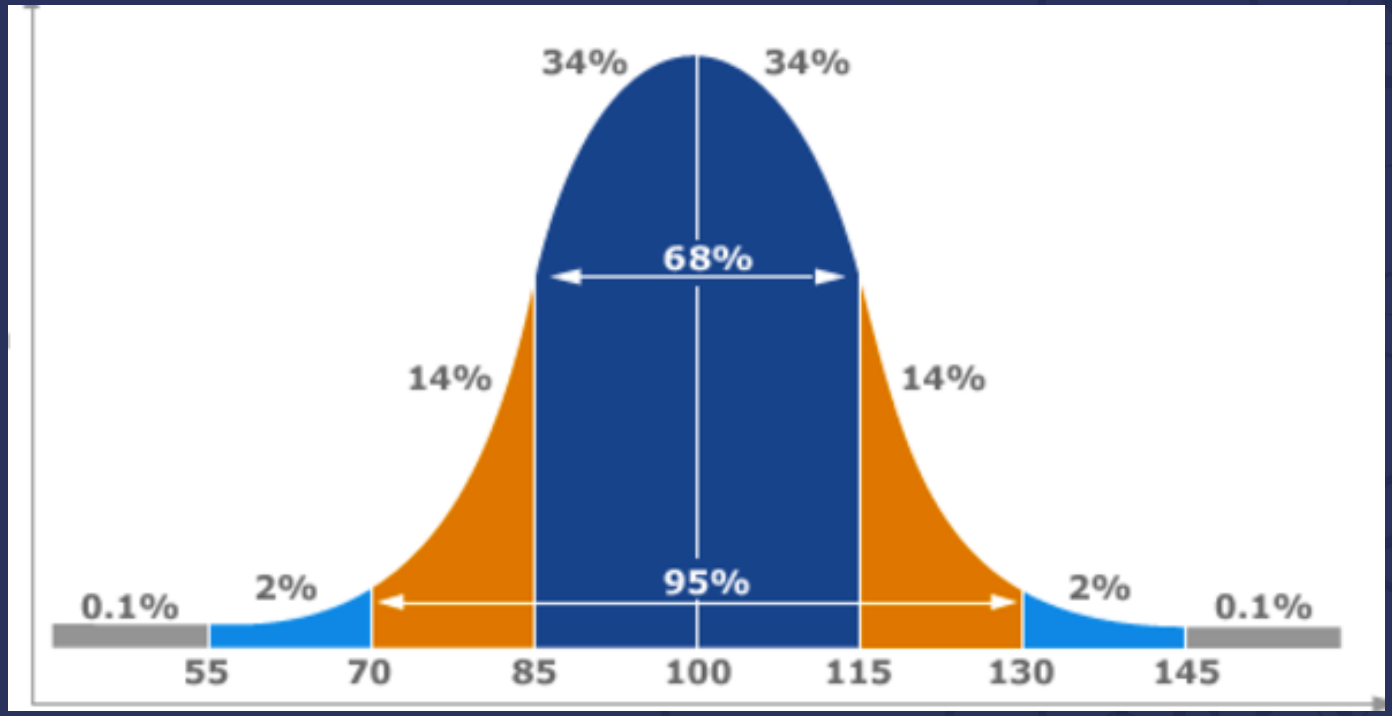



Trails A Educ 1-12
Trails A Educ 12+
Trails B Educ 1-12
Trails B Educ 12+
180
160
140
120
100
80
60
40
20
0
18-24
25-34
35-44
45-54
54-59
60-64
65-69
70-74
75-79
80-84
85-89
Age

IMPRESSION/SUMMARY: In summary Mr. Rose is a 72-year-old former neuropsychologist who is been having cognitive and memory difficulties for the past year to 2. On my testing he scored a 25 out of 30 on the MOCA. Consistent with mild cognitive impairment. This may be amnestic subtype though he did have some executive difficulties. His formal language testing was considered normal but did have some difficulties with some slight pauses in his overall speech I was only able to name 16 animals and 12 words beginning of F. His remaining neurological examination is unremarkable no evidence of any hallucinations or extrapyramidal features.

- NEUROLOGICAL EXAM
  MS: His language was fluent but slightly slow and hesitant. He scored a 25 out of 30 on the MOCA losing 1.4 trails, digit span back and 3 points for delayed recall. He named 12 words beginning with F, 16 animals with one repetition. Boston naming was 15 out of 15. On the I Boca he was 5 out of 5 on the visual association recall and recognition.
  CN: EOMI, PERRL, VFFTC, Face symmetrical. Tongue and uvula midline. Hearing intact.
  MOTOR: No drift. No adventitious movements. FFM and RAM are rapid. Full power throughout.
  SENSORY: Intact to LT
  DTR: Symmetrical throughout. Plantars are downgoing.
  COORDINATION: FFM, RAM, dysmetria, dysdidokokinesia.
  GAIT: Narrow based and steady.

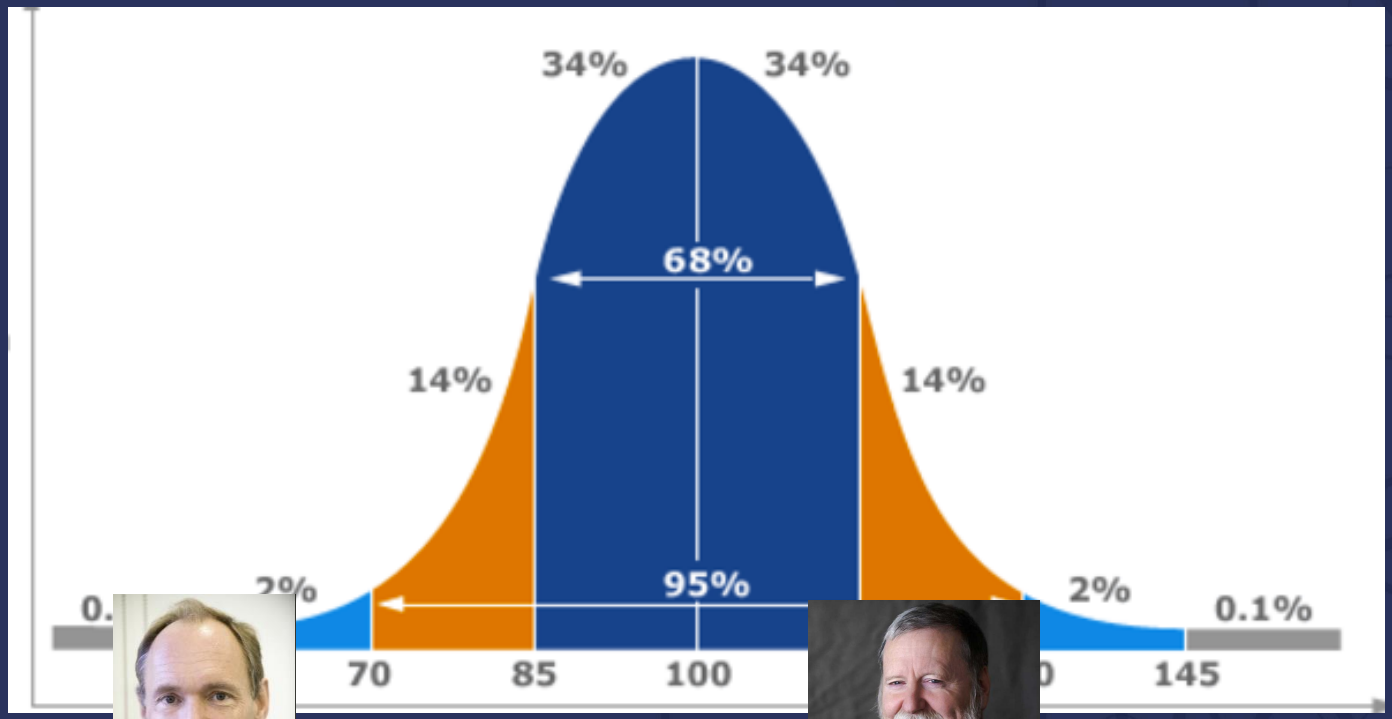
Where am I on the Executive Function Spectrum?



It depends……

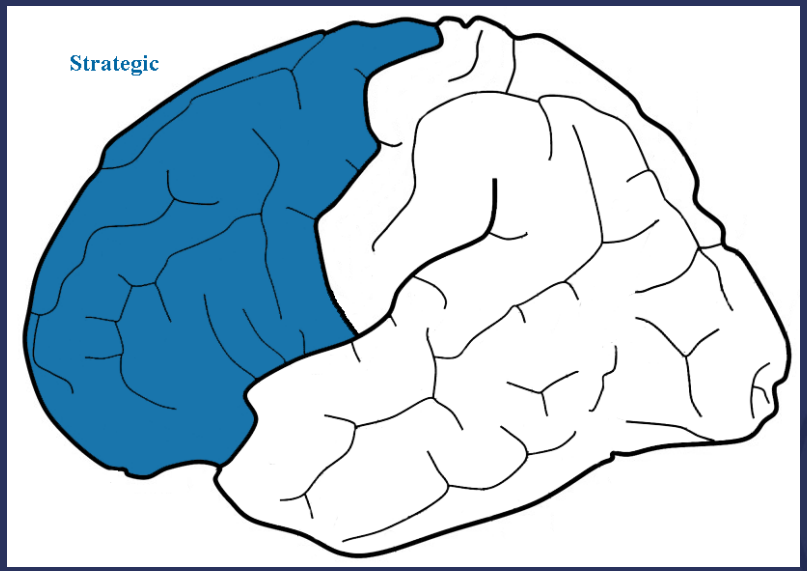
Tim Berners-Lee

Where am I on the Executive Function Spectrum?

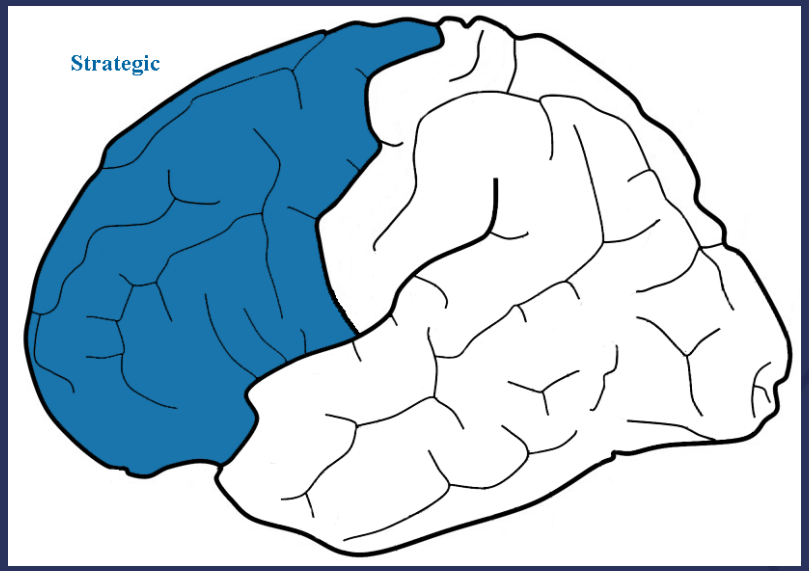


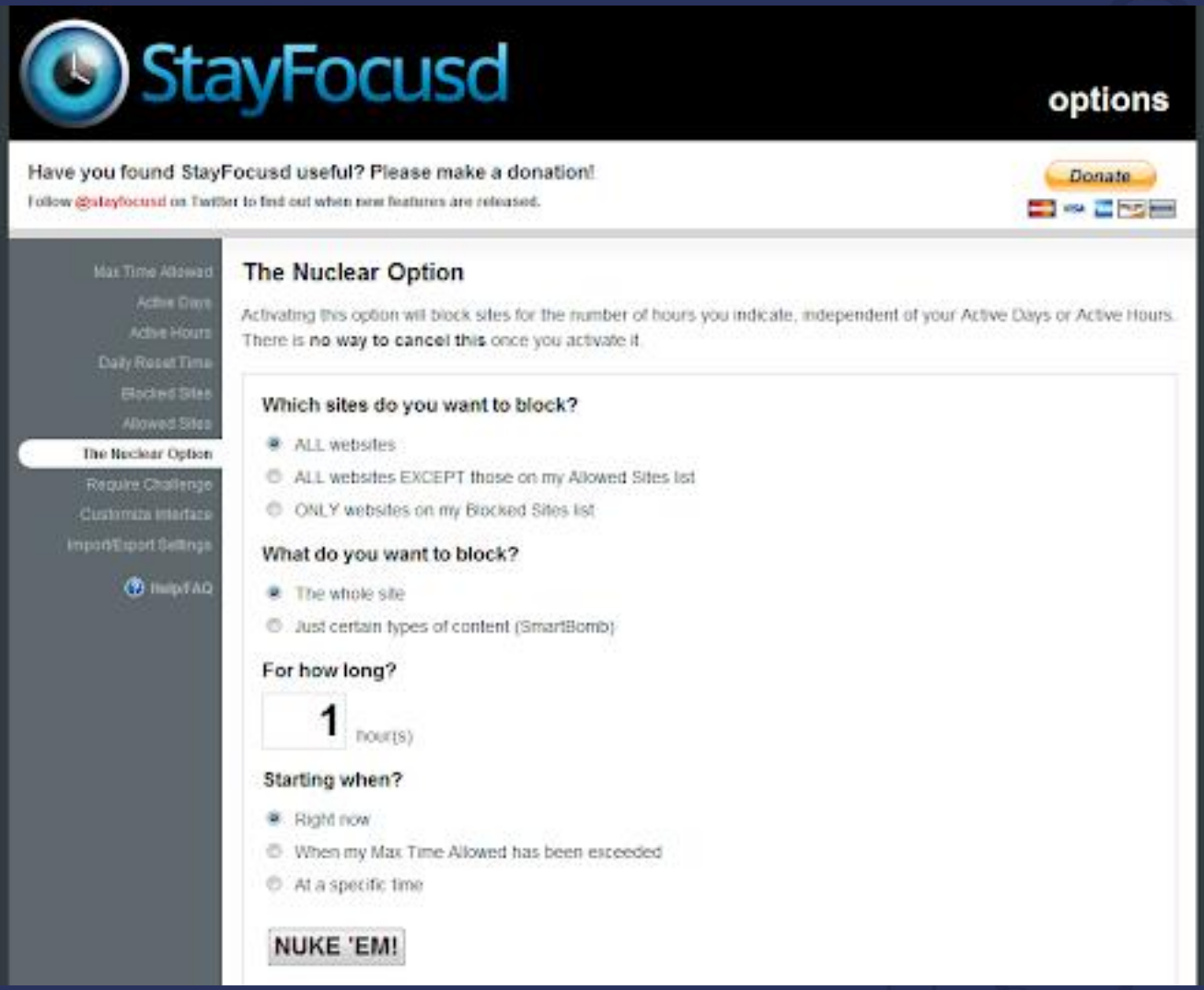
It depends……

Aging Changes Where I am on the Spectrum of Executive Function



Technology changes how I perform on the spectrum.

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options
Have you found StayFocusd useful? Please make a donation!
Follow @stayfocusd on Twitter to find out when new features are released.
Donate
Max Time Allowed
Active Days
Active Hours
Daily Reset Time
Blocked Sites
Allowed Sites
The Nuclear Option
Require Challenge
Customize Interface
Import/Export Settings
Help/FAQ
The Nuclear Option
Activating this option will block sites for the number of hours you indicate, independent of your Active Days or Active Hours.
There is no way to cancel this once you activate it.
Which sites do you want to block?
ALL websites
ALL websites EXCEPT those on my Allowed Sites list
ONLY websites on my Blocked Sites list
What do you want to block?
The whole site
Just certain types of content (SmartBomb)
For how long?
1
hour(s)
Starting when?
Right now
When my Max Time Allowed has been exceeded
At a specific time
NUKE 'EM!

Providing Options for Executive Function

The "how" of learning

Examples:

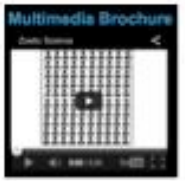
- Participate in class in multiple ways (physical action)
- Variety of ways to express learning: essay, powerpoint, video, project, presentation
- Chunking a semester-long project into manageable deliverables (executive function)

Deliverables and Products

1) Design Teams: Final Project

(Individuals take leadership on four distinct components)

Research Paper | Working Prototype | Implementation Plan | Marketing Media



T-560 Final Project

Scaffolding the Project

Final Product!
Incorporating Feedback
&
Integrating Multiple Means of Engagement
Due Tuesday, May 12th by 5:00 pm

Ning Group post: Submit a final version of your project, making sure to incorporate the feedback that you received on your second draft. We expect that your over-arching ideas, your uses of multiple means of representation and your uses of multiple means of action and expression will be fully developed. Finally, we would like you to integrate the last UDL principle: **multiple means of engagement**.

Here are your goals for each component. Please post this final product on your **Ning Group page**. Please use the modes of expression (i.e. writing, speaking, and/or drawing) that allow you to best fulfill the goals of this final product.

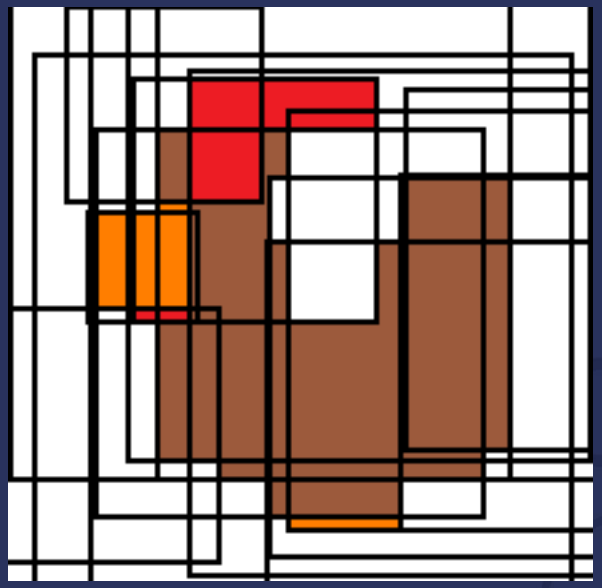
Component	Your goals for this final version
Statement of your product's goal	• The goal of your product is clear and has been guiding your design decisions around the 4 components of your product. All the following details are present: o What population of learners are you targeting? o What content/skill area are you focusing on? o What is the context in which your product will take place? (who will be using it, where, under what conditions?) o How will you assess if it's been effective?
Working Model/Prototype	• The description of how your product works/what it looks like is fully developed. • Links to standards are clear. • Your ideas for incorporating multiple means of representation and multiple means of action and expression

Scaffolding the Project

Component #3: Multimedia Brochure/Video

	Does not meet expectations	Meets some of the expectations	Meets all expectations	TF Comments
Presentation				
Goals and Product Description	The educational goals of the product are not included or are unclear; the description of the product and who/what it is designed for is not included or is unclear	The educational goals and description of the product are included, but may lack clarity, specificity or depth; potential users have some idea of what they would be receiving	The educational goals and description of the product are clearly shown throughout the video in an engaging way; potential users know exactly what they would be receiving	
Key Features Highlighted	None of the key features of the product are highlighted; no connections to UDL guidelines/checkpoints are made; the brochure/video (or highly detailed storyboard) is vague and fails to engage the viewer in a meaningful way	The key features are highlighted, but may lack specificity or clarity; connections to UDL guidelines/checkpoints are made at times; the brochure/video (or highly detailed storyboard) is mostly engaging and clear; schools and districts might consider using this product	The key features are well chosen and highlighted with vivid detail and supporting examples; connections to UDL guidelines/checkpoints are made throughout; the brochure/video (or highly detailed storyboard) is engaging and clear throughout; this product is a must-have for any school or district	
Incorporation of the UDL Engagement Guidelines to address individual differences:				
Guideline 7: Provide options for recruiting interest	Fails to demonstrate how the product provides options for recruiting interest; these	Does a good job of highlighting the ways in which the product provides options for recruiting interest to address learner	Does an outstanding job of highlighting the myriad ways in which the product provides options for recruiting interest	

Scaffolding the Group Process



Team Learning Assessment Rubric

T560

Based on R. Elmore's course on supporting teachers for instructional change

T-560 Semester long project

Goal: In teams of 4-5, develop an educational intervention of their choice that supports robust disciplinary thinking within a particular content area for *all* students. The final product that consists of four interrelated parts:

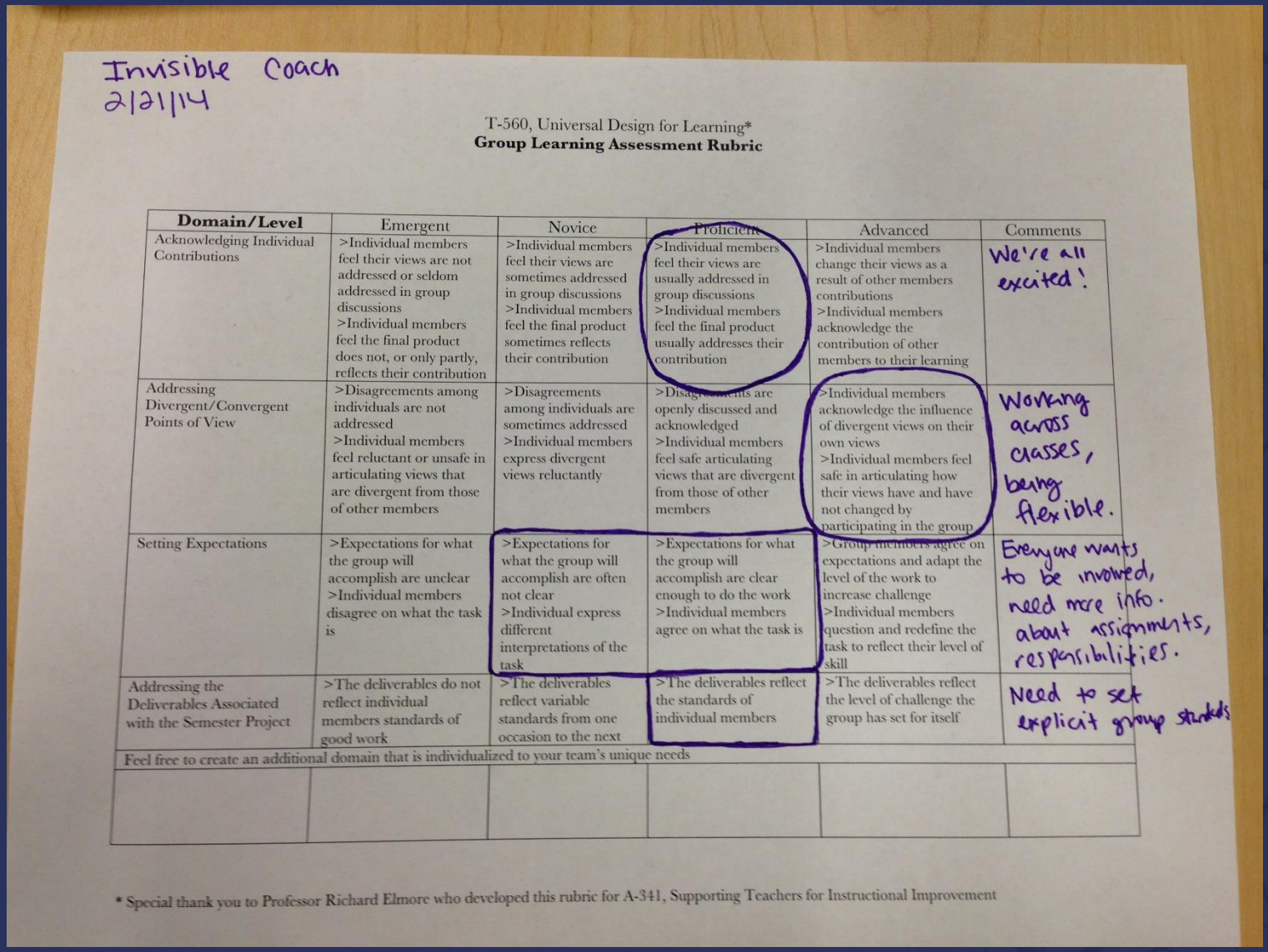
1. Working prototype or highly detailed mock-up of the intervention
2. Multimedia "brochure"
3. Research white paper
4. Implementation guide

Barriers

- Challenging group dynamics that need to be addressed early on
- "Group think" could take over and lead to teams not pushing themselves
- Logistics of working in a team

Group Learning Rubric

Domain/Level	Emergent	Novice	Proficient	Advanced	Comments
Acknowledging Individual Contributions	>Individual members feel their views are not addressed or seldom addressed in group discussions >Individual members feel the final product does not, or only partly, reflects their contribution	>Individual members feel their views are sometimes addressed in group discussions >Individual members feel the final product sometimes reflects their contribution	>Individual members feel their views are usually addressed in group discussions >Individual members feel the final product usually addresses their contribution	>Individual members change their views as a result of other members contributions >Individual members acknowledge the contribution of other members to their learning	
Addressing Divergent/Convergent Points of View	>Disagreements among individuals are not addressed >Individual members feel reluctant or unsafe in articulating views that are divergent from those of other members	>Disagreements among individuals are sometimes addressed >Individual members express divergent views reluctantly	>Disagreements are openly discussed and acknowledged >Individual members feel safe articulating views that are divergent from those of other members	>Individual members acknowledge the influence of divergent views on their own views >Individual members feel safe in articulating how their views have and have not changed by participating in the group	
Setting Expectations	>Expectations for what the group will accomplish are unclear >Individual members disagree on what the task is	>Expectations for what the group will accomplish are often not clear >Individual express different interpretations of the task	>Expectations for what the group will accomplish are clear enough to do the work >Individual members agree on what the task is	>Group members agree on expectations and adapt the level of the work to increase challenge >Individual members question and redefine the task to reflect their level of skill	
Addressing the Deliverables Associated with the Semester Project	>The deliverables do not reflect individual members standards of good work	>The deliverables reflect variable standards from one occasion to the next	>The deliverables reflect the standards of individual members	>The deliverables reflect the level of challenge the group has set for itself	

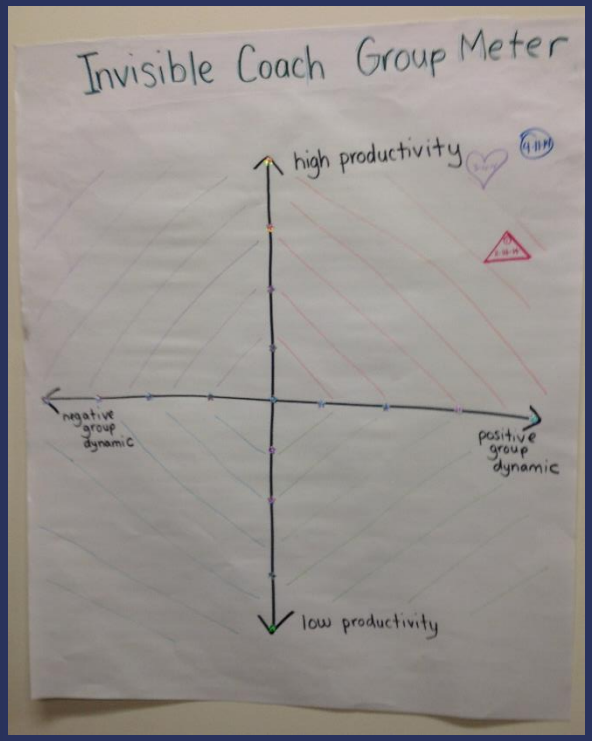


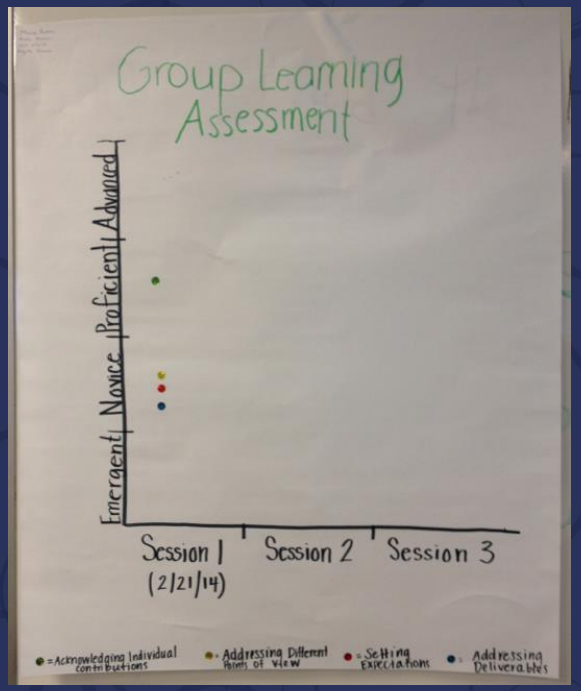
Invisible Coach
2/21/14

T-560, Universal Design for Learning*
Group Learning Assessment Rubric

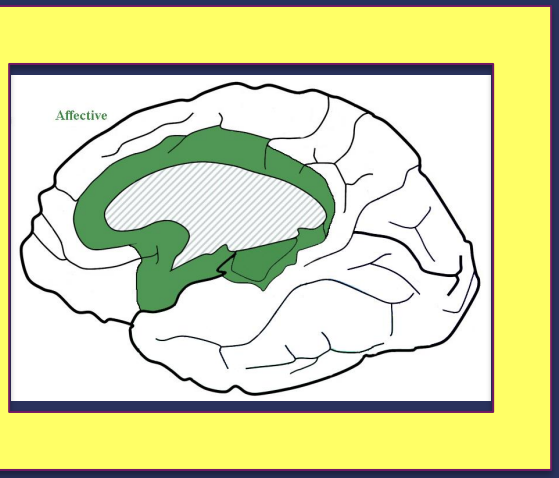
Domain/Level	Emergent	Novice	Proficient	Advanced	Comments
Acknowledging Individual Contributions	>Individual members feel their views are not addressed or seldom addressed in group discussions >Individual members feel the final product does not, or only partly, reflects their contribution	>Individual members feel their views are sometimes addressed in group discussions >Individual members feel the final product sometimes reflects their contribution	>Individual members feel their views are usually addressed in group discussions >Individual members feel the final product usually addresses their contribution	>Individual members change their views as a result of other members contributions >Individual members acknowledge the contribution of other members to their learning	We're all excited!
Addressing Divergent/Convergent Points of View	>Disagreements among individuals are not addressed >Individual members feel reluctant or unsafe in articulating views that are divergent from those of other members	>Disagreements among individuals are sometimes addressed >Individual members express divergent views reluctantly	>Disagreements are openly discussed and acknowledged >Individual members feel safe articulating views that are divergent from those of other members	>Individual members acknowledge the influence of divergent views on their own views >Individual members feel safe in articulating how their views have and have not changed by participating in the group	Working across classes, being flexible.
Setting Expectations	>Expectations for what the group will accomplish are unclear >Individual members disagree on what the task is	>Expectations for what the group will accomplish are often not clear >Individual express different interpretations of the task	>Expectations for what the group will accomplish are clear enough to do the work >Individual members agree on what the task is	>Group members agree on expectations and adapt the level of the work to increase challenge >Individual members question and redefine the task to reflect their level of skill	Everyone wants to be involved, need more info. about assignments, responsibilities.
Addressing the Deliverables Associated with the Semester Project	>The deliverables do not reflect individual members standards of good work	>The deliverables reflect variable standards from one occasion to the next	>The deliverables reflect the standards of individual members	>The deliverables reflect the level of challenge the group has set for itself	Need to set explicit group standards
Feel free to create an additional domain that is individualized to your team's unique needs					

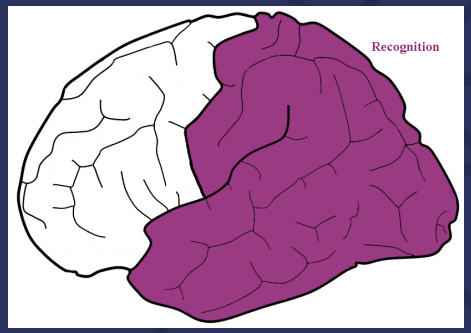
* Special thank you to Professor Richard Elmore who developed this rubric for A-341, Supporting Teachers for Instructional Improvement

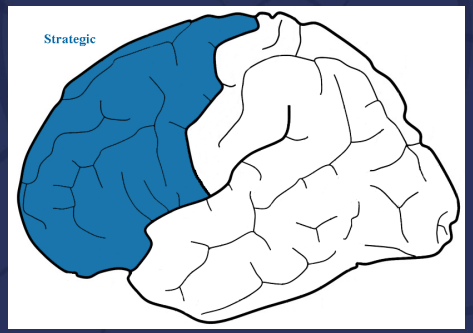




Where do the three principles come from?

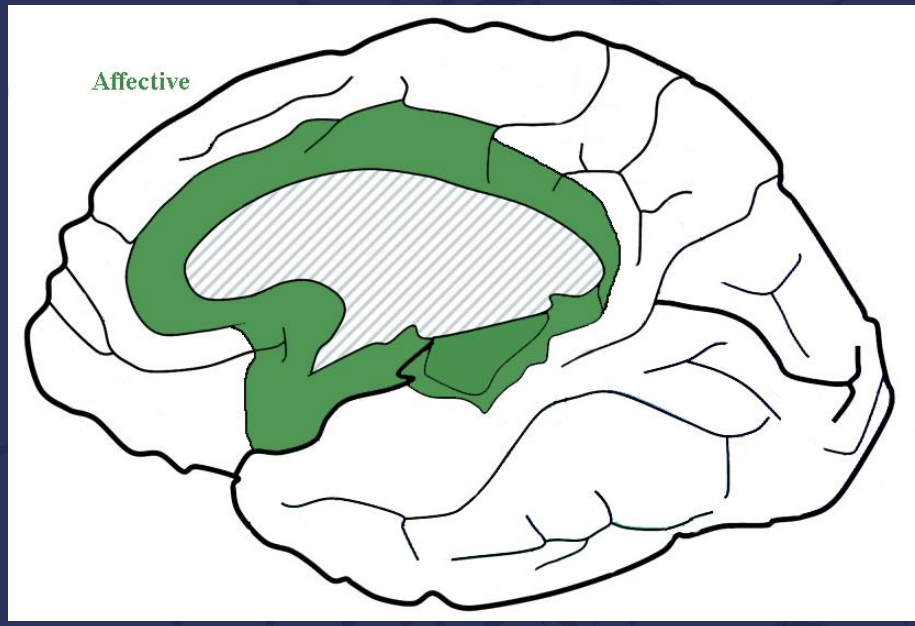






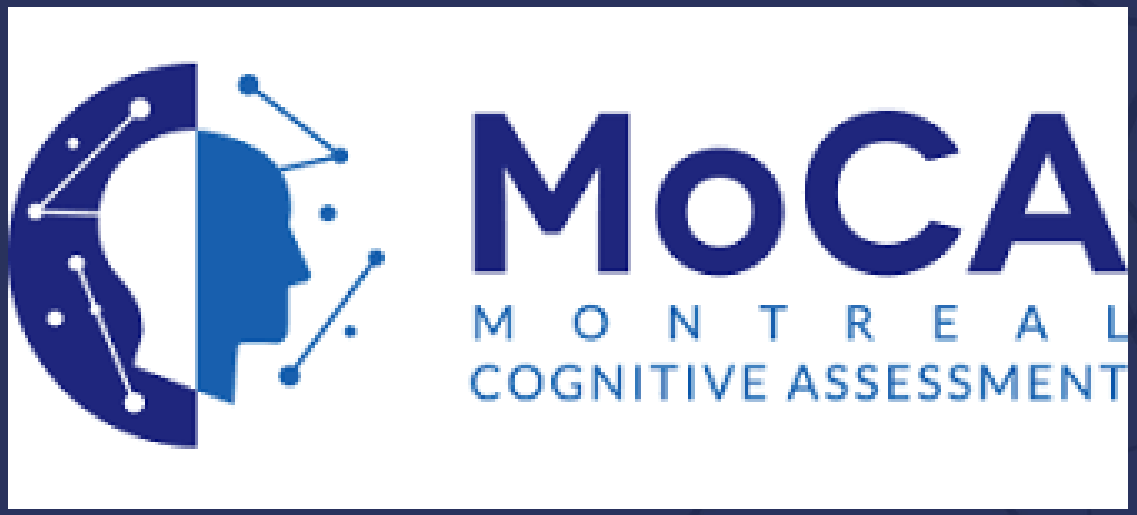
Affective (Emotional) Networks
What's Important?

Setting priorities for planning, attending, searching, choosing, remembering.



IMPRESSION/SUMMARY: In summary Mr. Rose is a 72-year-old former neuropsychologist who is been having cognitive and memory difficulties for the past year to 2. On my testing he scored a 25 out of 30 on the MOCA. Consistent with mild cognitive impairment. This may be amnestic subtype though he did have some executive difficulties. His formal language testing was considered normal but did have some difficulties with some slight pauses in his overall speech I was only able to name 16 animals and 12 words beginning of F. His remaining neurological examination is unremarkable no evidence of any hallucinations or extrapyramidal features.

- NEUROLOGICAL EXAM
  MS: His language was fluent but slightly slow and hesitant. He scored a 25 out of 30 on the MOCA losing 1.4 trails, digit span back and 3 points for delayed recall. He named 12 words beginning with F, 16 animals with one repetition. Boston naming was 15 out of 15. On the I Boca he was 5 out of 5 on the visual association recall and recognition.
  CN: EOMI, PERRL, VFFTC, Face symmetrical. Tongue and uvula midline. Hearing intact.
  MOTOR: No drift. No adventitious movements. FFM and RAM are rapid. Full power throughout.
  SENSORY: Intact to LT
  DTR: Symmetrical throughout. Plantars are downgoing.
  COORDINATION: FFM, RAM, dysmetria, dysdidokokinesia.
  GAIT: Narrow based and steady.



Nothing about Emotion?
About Affect or Interest?
About Self-Regulation?

Students with reading disabilities are in threat states when asked to read

	Mean Heart Rate at Baseline	SD
LD (n=21)	85.2	11.6
Non-LD (n=53)	77.5	11.9

t=-2.54, p=.02

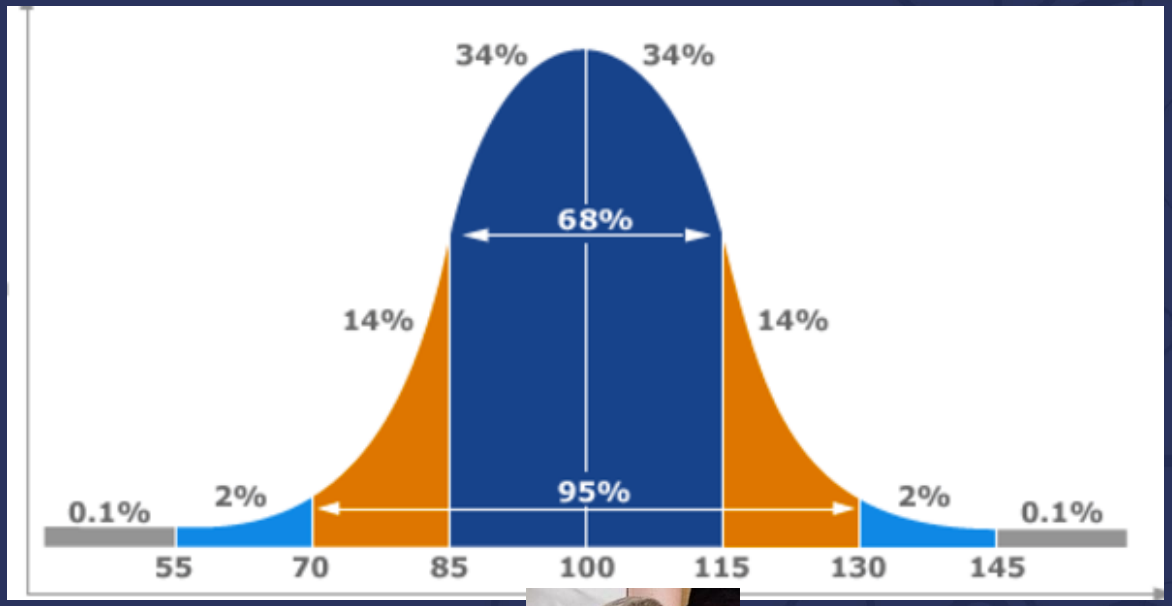
Daley, S, (2015).

Dorenkamp, M. A., & Vik, P. (2018). Neuropsychological assessment anxiety: A systematic review. *Practice Innovations, 3*(3), 192–211.

Abstract

Older adults are the fastest growing population seeking cognitive assessment services, primarily regarding cognitive concerns and capacity to live independently. Neuropsychological assessment can evoke stress/anxiety in patients, and anxiety has been implicated in poor test performance. A review of the literature failed to identify empirical articles dedicated to the impact of a patient's awareness of the purpose and potential implications of a neuropsychological evaluation on test performance. This article systematically reviewed literature regarding anxiety/stress to understand what anxiety domains threaten performance, and identify vulnerable cognitive abilities. Seventy-eight articles were reviewed. Sixty anxiety/stress measures were used and were classified into 7 domains: global, trait, state, social, test, and math anxiety, and stress. There were 149 neuropsychological tests that were used and classified into 13 domains: academic achievement, attention, executive functioning (inhibition/switching and reasoning/fluency), full scale intelligence, language, memory (overall, verbal, and visual), mental status exams, motor, perception, processing speed, verbal comprehension, and working memory. Results revealed that (a) most studies examined healthy adult populations, (b) few studies used clinical samples, and (c) no studies focused on older adults from clinical populations. Of the studies reviewed, nearly 2/3 reported some relationship between test performance and anxiety. Test, social, state, and math anxiety were most often associated with poor test performance. Verbal memory, attention, inhibition, and working memory were most consistently associated with anxiety. Findings highlight the importance of attending to anxiety in older adults referred for neuropsychological evaluation and the need for anxiety assessment measures that are sensitive to aging patients' concerns.

Where am I headed on the spectrum?



Hypo Anxious/Fearless

Hyper Anxious/Phobic

Provide Multiple Means of Engagement

Purposeful, motivated learners

Provide options for self-regulation

- Promote expectations and beliefs that optimize motivation
- Facilitate personal coping skills and strategies
- Develop self-assessment and reflection

Provide options for sustaining effort and persistence

- Heighten salience of goals and objectives
- Vary demands and resources to optimize challenge
- Foster collaboration and community
- Increase mastery-oriented feedback

Provide options for recruiting interest

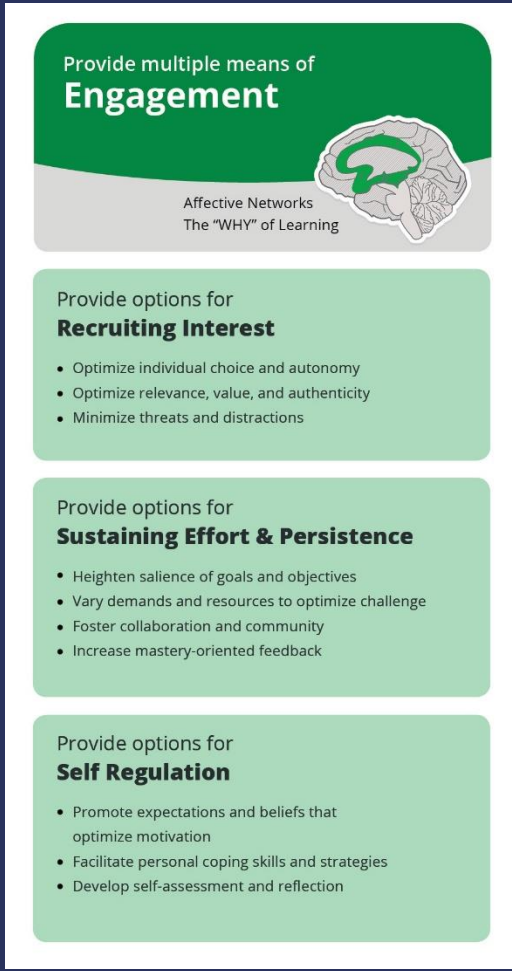
- Optimize individual choice and autonomy
- Optimize relevance, value, and authenticity
- Minimize threats and distractions

Teaching as Emotional Work

The most important functions of emotions—especially for humans and other mammals—is to prioritize what we *learn*. While emotions have effects throughout the body, it is their effects on the brain—on what we learn (and don't learn)—that is their most powerful effect. Indeed, some researchers emphasize that the critical role of emotions is to provide "learning signals" that alert the brain that something is important enough to attend to and learn.

The Influences of Emotion on Learning and Memory

Chai M. Tyng, Hafeez U. Amin, Mohamad N. M. Saad, and Aamir S. Malik (2017)*



The "why" of learning

Examples:

- Make assignments relevant (recruiting interest);
- give lots of choice
- Critical peer feedback sessions (effort & persistence)
- Assessing oneself using a rubric before handing in an assignment (self-regulation)

A Typical Tuesday in T-560

Whole Class Lecture and Presentations: 1:10 - 2 PM

Design Team Workshops: 2:10 - 3 PM

Advanced Consulting Groups: 3:10 -4:00 PM

Research Group

Pedagogy Group

Media Marketing Group

Technology Grp

The Purposes and Goals of Class Activities

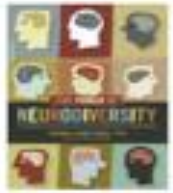
Everyone Reads

Week One

Week Two

Week Three

Universal Design for Learning: (2014)



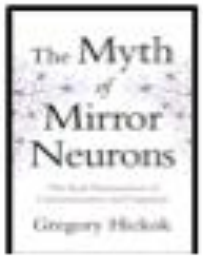
The Power of Neurodiversity: (2012)

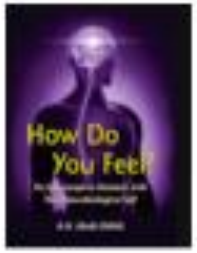
Advanced Consulting Groups Read

	Research Group	Pedagogy Group	Media Group	Technology Group
Week Four Week Five Week Six	 Proust and the Squid: The story and science of the reading Brain.	 UDL NOW: A Teachers Monday Morning Guide.	 Design and Deliver: Planning and Teaching using UDL.	 Mobile Learning for All; a UDL approach
Week Eight Week Nine Week Ten	 Number Sense, How the mind creates mathematics (2012)	 Universal Design in the Classroom (2012)	 Unconscious Branding: How Neuroscience informs Marketing	 A Web For Everyone: Designing Accessible User Experiences (2013)

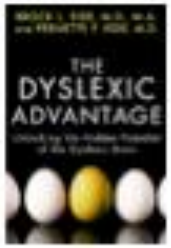
Individuals Read (Choose One)

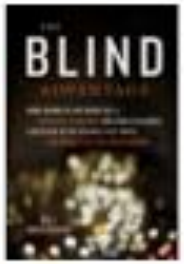
On Learning Science





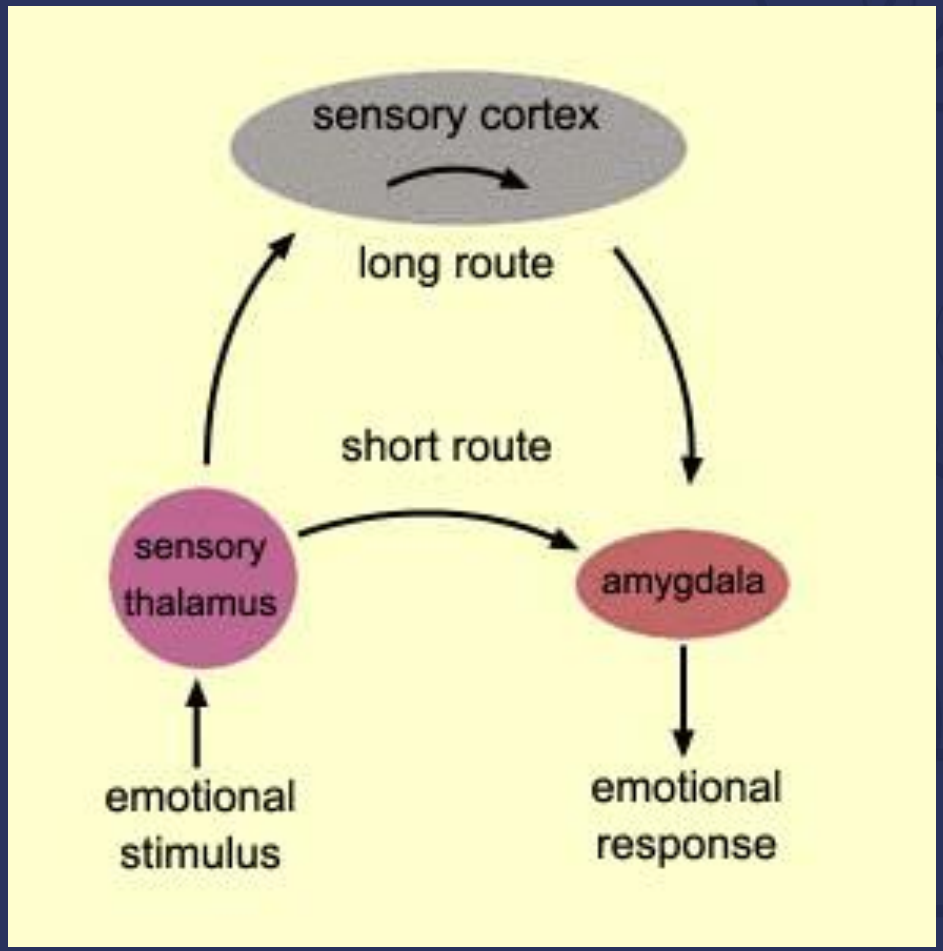
On individual differences





On learning design and art

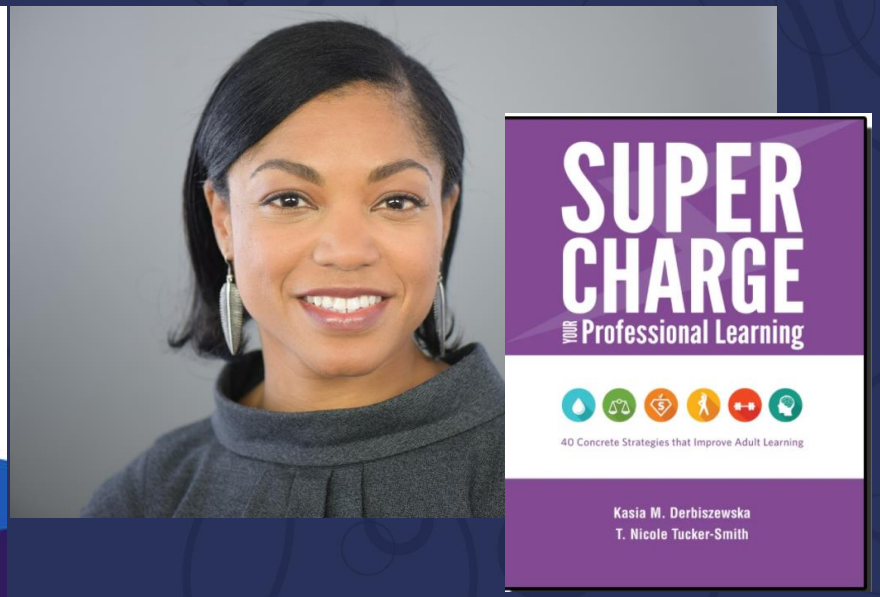

Two Routes to Emotion



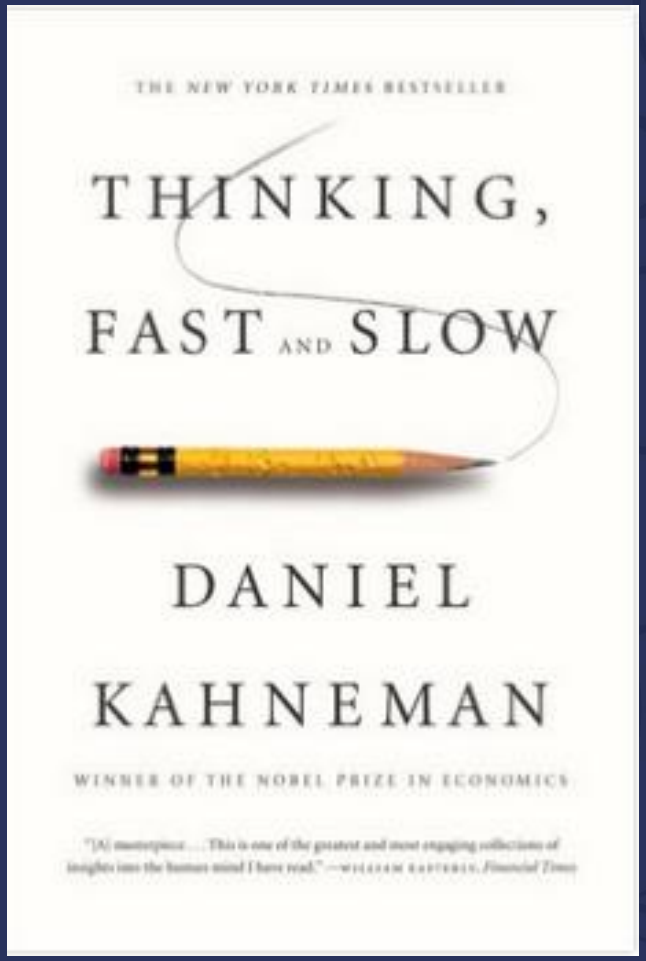
White Coat Hypertension.

What about identity barriers? Racism, Sexism, Ageism, Ableism

Two Books on UDL and Teaching for Racial Equity



Two Kinds of Control Systems



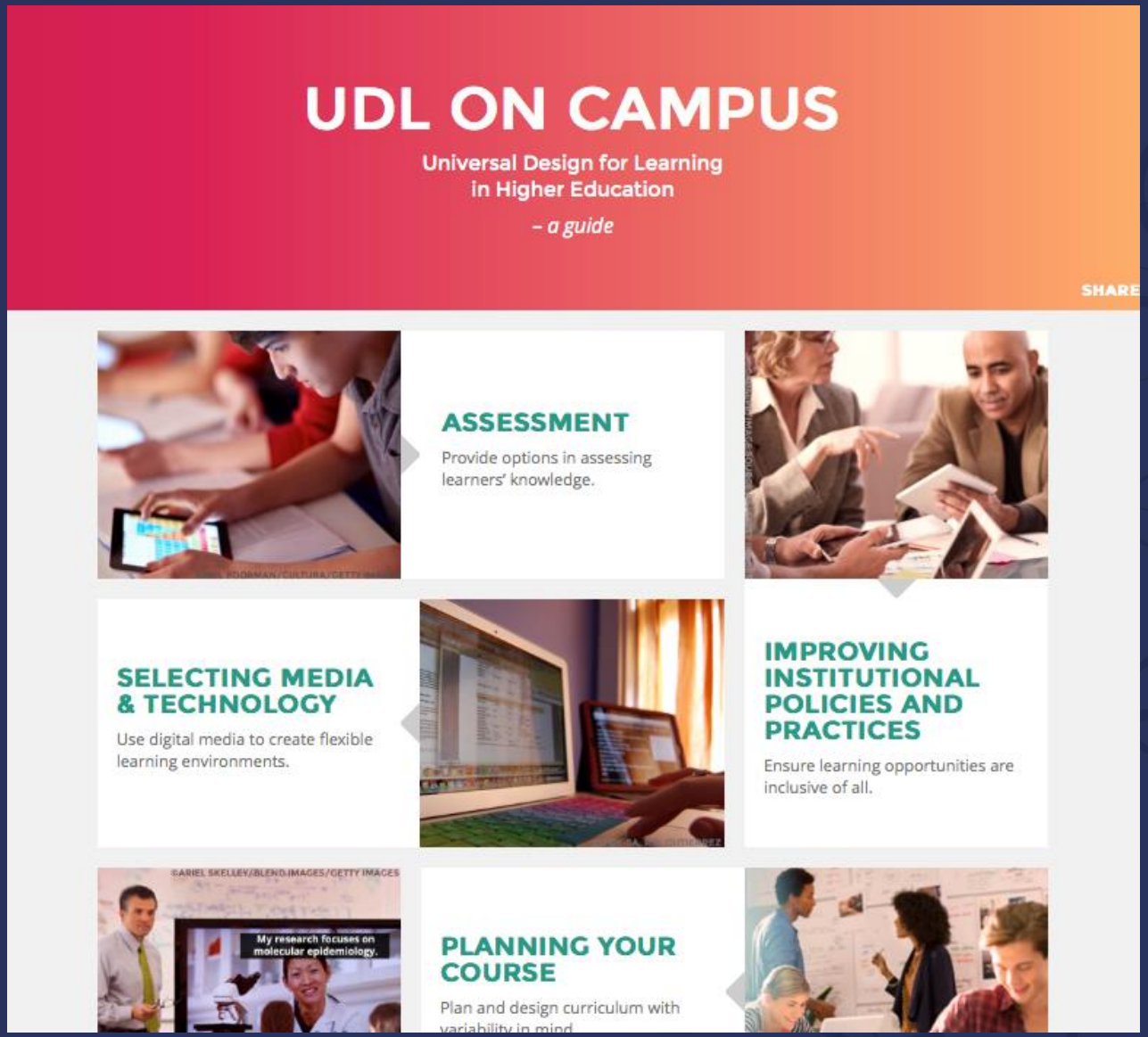
Two Kinds of Control Systems

Automatic (FAST) System

Executive (SLOW) System

Two Kinds of Control Systems

Automatic (FAST) System	Executive (SLOW) System
Automatic	Strategic
Unconscious	Conscious
Rapid	Slow
Large capacity	Limited Capacity
Implicit	Explicit
Intuitive	Deliberative
Present-oriented	Future-Oriented
Evolutionarily Old (and perfected)	Evolutionarily New (but cocky)



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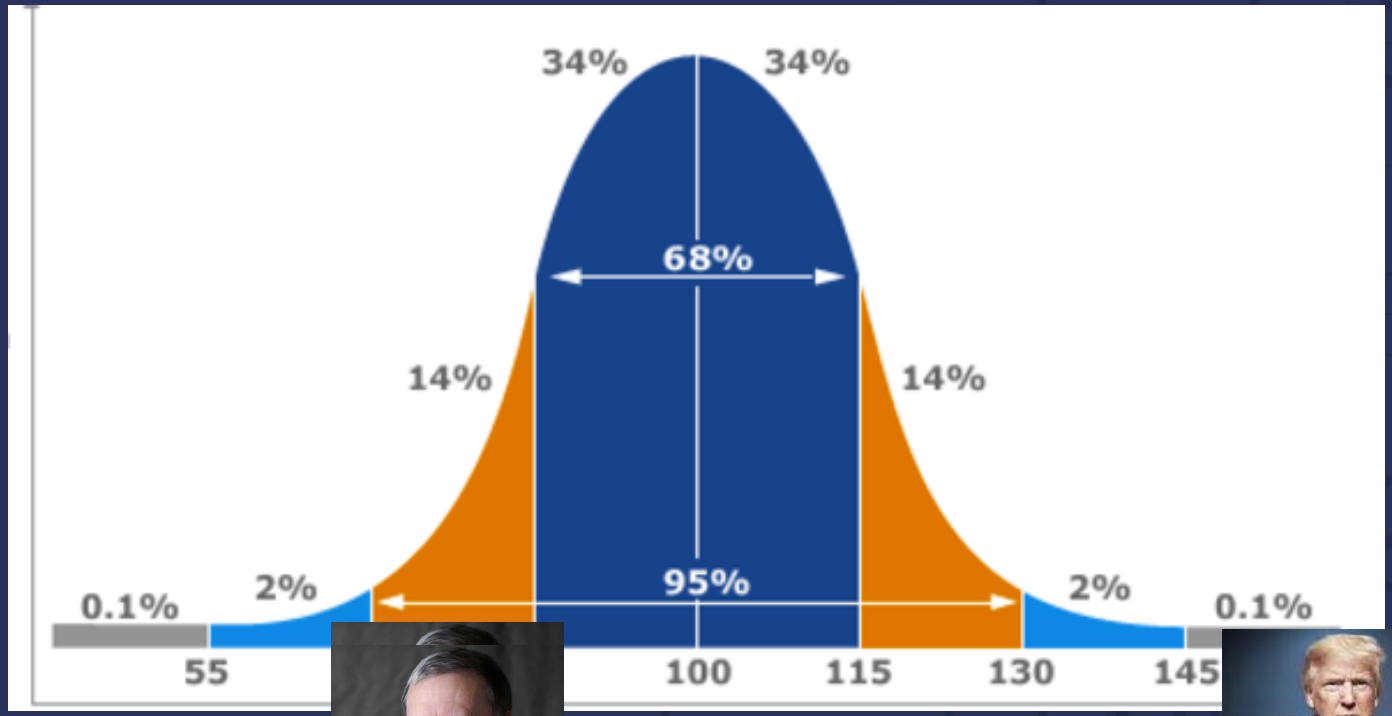
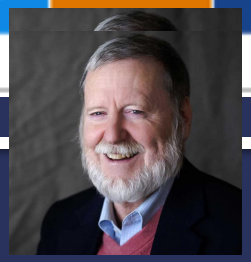
Where am I on the Cognitive Impairment Spectrum?

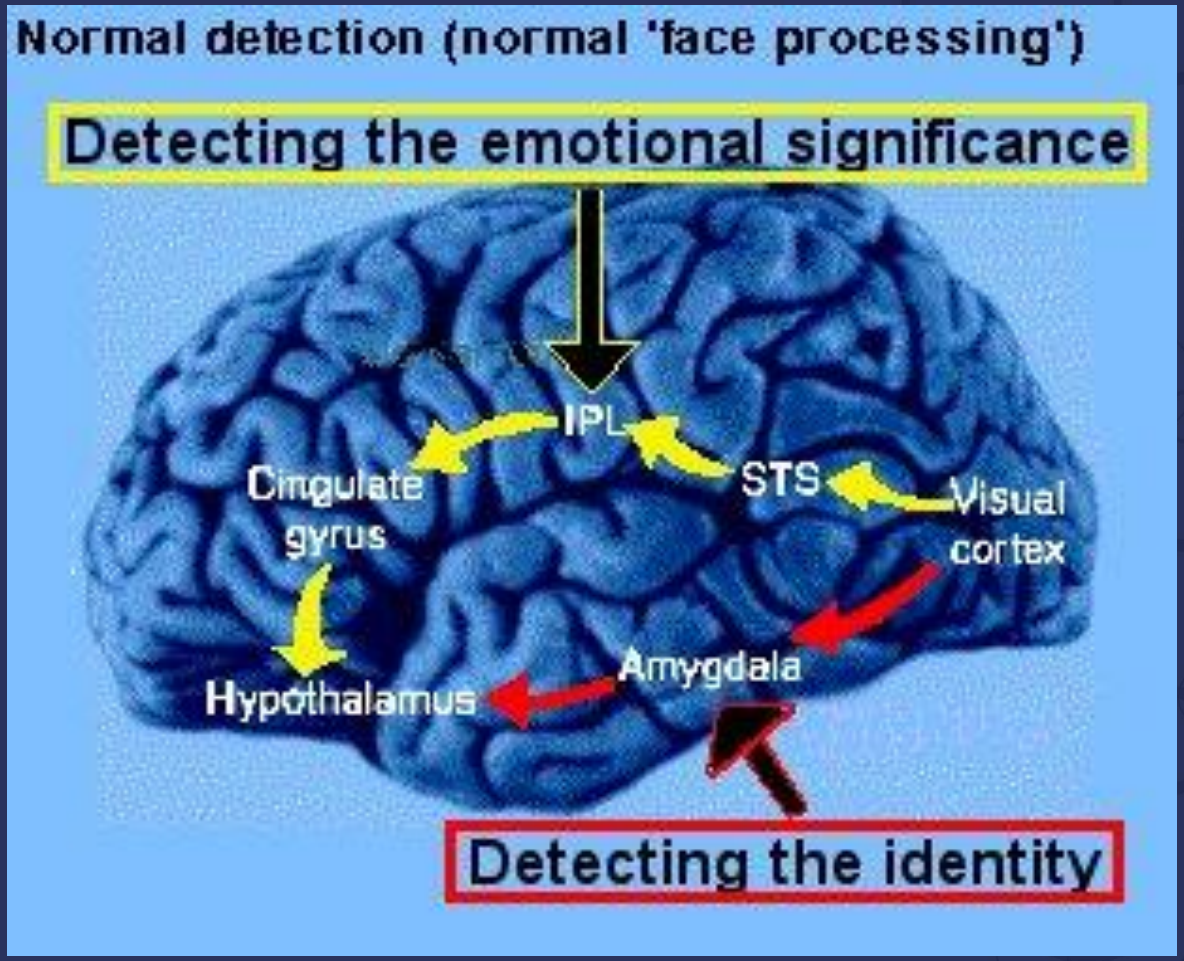




It depends……

Vote

(With your executive control systems)


Normal detection (normal 'face processing')
Detecting the emotional significance
IPL
Cingulate gyrus
STS
Visual cortex
Amygdala
Hypothalamus
Detecting the identity

Purpose: Not to Create Emotion But to Leverage it

#3 avoiding or handling negative affective states

Recursive Processes in Self-Affirmation: Intervening to Close the Minority Achievement Gap

Geoffrey L. Cohen[1,*], Julio Garcia[1], Valerie Purdie-Vaughns[2], Nancy Apfel[3], Patricia Brzustoski[3]

Challenge of a self-reinforcing cycle – threat of low performance impairs performance, which increases threat, which lowers performance…
Can an intervention interrupt the cycle? >> Can we change the nature of the interaction with school tasks?

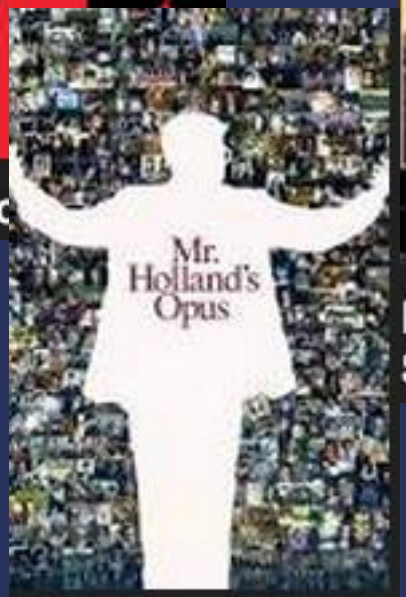
Writing activity about "your ideas, your beliefs, and your life." Choose the values most and least important to you. Focus on the value most important to you. Think about a time when this value was important to you. In a few sentences, describe why the selected value is important to you.
(3-5 times a year in seventh grade)

African-American students who received the intervention showed a significant improvement on GPA over TWO YEARS, and this was particularly pronounced for students with lower initial achievement levels. No effect for European Americans.

AnneMarie Darrow Baines

Hollywood gets it!

Lean o



Mr. Holland's Opus

Dead Poets Society

Freedom Writers

ir, with Love

Stand and Deliver

Designing For *Perceptual* Diversity

Start here: Self-Check.
I think I know something about this already - what more do I need to know?

Or start here: I'm not sure I really care about this. Give me some background to understand the problem. Convince me.

Or start here: I understand the problem. What I want is some guided practice in what to do about it.

Or Start here: I already know what to do, just show me the models, guidelines and/or tools that can help me.

Universal Design for Learning

I. Provide Multiple Means of Representation	II. Provide Multiple Means of Action and Expression	III. Provide Multiple Means of Engagement
Perception	Physical action	Recruiting interest
Language, expressions, and symbols	Expression and communication	Sustaining effort and persistence
Comprehension	Executive function	Self-regulation

A Typical Tuesday in T-560

Whole Class Lecture and Presentations: 1:10 - 2 PM

Design Team Workshops: 2:10 - 3 PM

Advanced Consulting Groups: 3:10 -4:00 PM

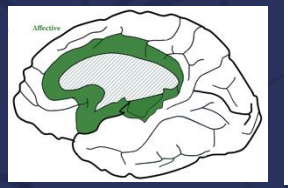
Research Group

Pedagogy Group

Media Marketing Group

Technology Grp

The Purposes and Goals of Class Activities



III. Provide Multiple Means of Engagement

- Recruiting interest
- Sustaining effort and persistence
- Self-regulation

3) Additional Individual Options:

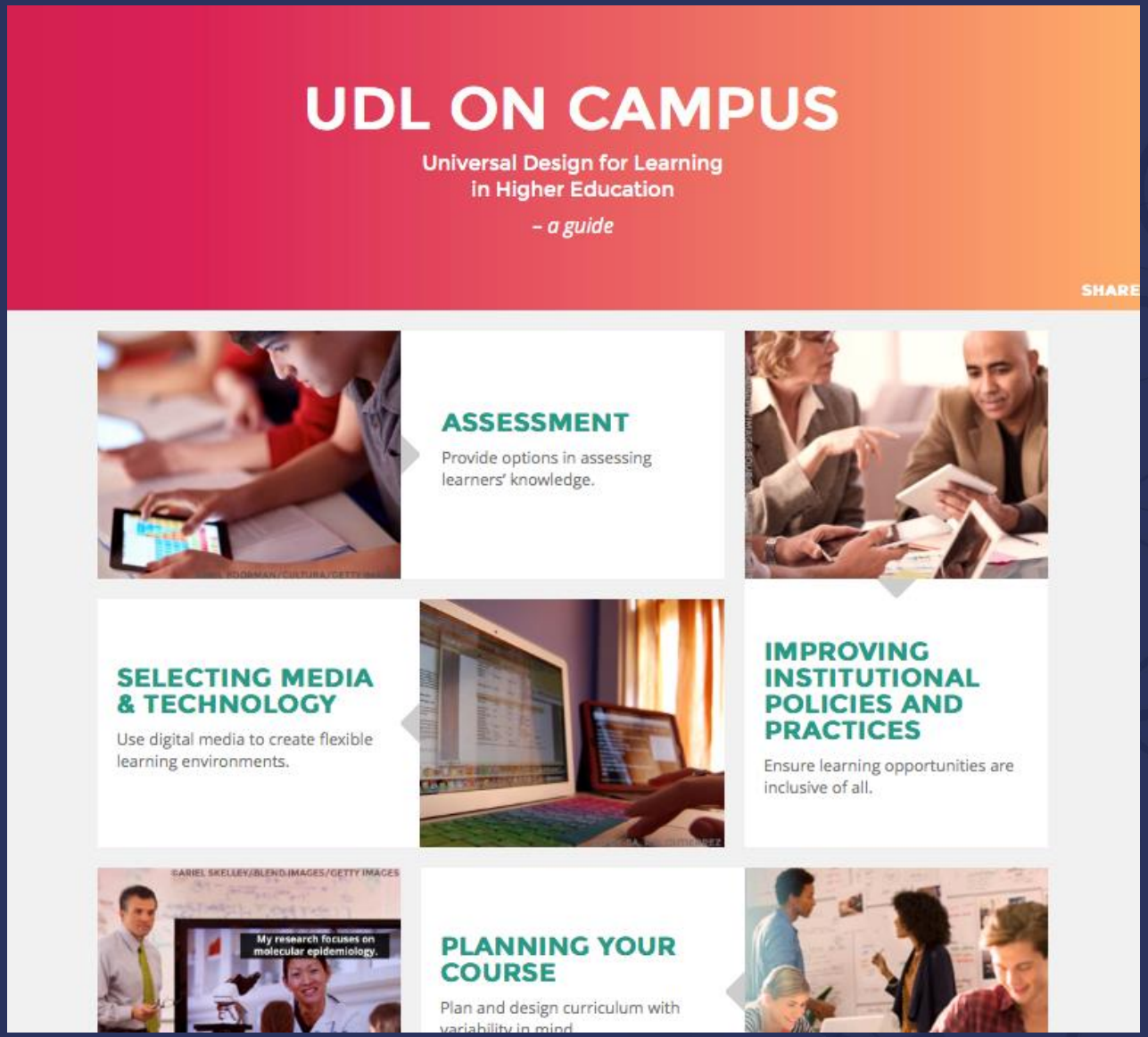
Individuals may contribute to building an active community of practice in the course by such options as: 1) taking (and publishing) notes of the whole class presentations or meetings of the Advanced Consulting Groups, 2) creating videos of key observations or practices, 3) preparing brief presentations or media for the Advanced Consulting Groups, 4) Leading social media discussion groups on specialized topics of interest, etc.

National Policy: Higher Education Act

Section 103(24) **UNIVERSAL DESIGN FOR LEARNING**. The term 'universal design for learning' means a scientifically valid framework for guiding educational practice that—

(A) provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged; and

(B) reduces barriers in instruction, provides appropriate accommodations, supports, and challenges, and maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient.



udloncampus.cast.org/home

- Make the connection with stereotype threat. Prove that I have lost it. My score goes down. Expectancy effects too. Looking for strengths?
- Autism in all three? Certainly in overwhelmed, but also anxiety.

- Let's look at a lecture. Sensory, language, comprehension. (can repeat, connect to other sources, etc. Always provide more background, Connect to real life, etc use analogies.
  - How to improve lectures: make them multiple reps
  - For one thing, make the slides multiple reps. Not outlines alone, but lots of images. Another rep
  - Give them ahead, accessible slides, etc. Weaken slides if just same text . Embed videos.
  - The lecture intelfe: post it on Google, let Google translate work, have one student fix it.

RECOMMENDATIONS:

Issue #1 MILD COGNITIVE IMPAIRMENT. His performance as well as his history are suggestive of mild cognitive impairment possibly amnestic or executive subtype. We did discuss the natural history of patients with mild cognitive impairment. I talked about further workup and evaluation including MRI scan, CSF analysis, neuropsychological testing, As well as enrolling in some research projects.

I talked to him about other lifestyle changes this includes daily physical activity, keeping mentally active and engaged, and a heart healthy Mediterranean diet.

IMPRESSION/SUMMARY: In summary Mr. Rose is a 72-year-old former neuropsychologist who is been having cognitive and memory difficulties for the past year to 2. On my testing he scored a 25 out of 30 on the MOCA. Consistent with mild cognitive impairment. This may be amnestic subtype though he did have some executive difficulties. His formal language testing was considered normal but did have some difficulties with some slight pauses in his overall speech I was only able to name 16 animals and 12 words beginning of F. His remaining neurological examination is unremarkable no evidence of any hallucinations or extrapyramidal features.

- NEUROLOGICAL EXAM
  MS: His language was fluent but slightly slow and hesitant. He scored a 25 out of 30 on the MOCA losing 1.4 trails, digit span back and 3 points for delayed recall. He named 12 words beginning with F, 16 animals with one repetition. Boston naming was 15 out of 15. On the I Boca he was 5 out of 5 on the visual association recall and recognition.
  CN: EOMI, PERRL, VFFTC, Face symmetrical. Tongue and uvula midline. Hearing intact.
  MOTOR: No drift. No adventitious movements. FFM and RAM are rapid. Full power throughout.
  SENSORY: Intact to LT
  DTR: Symmetrical throughout. Plantars are downgoing.
  COORDINATION: FFM, RAM, dysmetria, dysdidokokinesia.
  GAIT: Narrow based and steady.

RECOMMENDATIONS:

Issue #1 MILD COGNITIVE IMPAIRMENT. His performance as well as his history are suggestive of mild cognitive impairment possibly amnestic or executive subtype. We did discuss the natural history of patients with mild cognitive impairment. I talked about further workup and evaluation including MRI scan, CSF analysis, neuropsychological testing, As well as enrolling in some research projects.

I talked to him about other lifestyle changes this includes daily physical activity, keeping mentally active and engaged, and a heart healthy Mediterranean diet.

By **John M. Grohol, Psy.D.**
Founder & Editor-in-Chief

President Trump recently underwent his annual physical checkup. At Trump's apparent insistence, the physician also administered a test of cognitive ability, the Montreal Cognitive Assessment (MoCA).

Some are citing this test to demonstrate that Trump does not have a mental illness or any other personality disorder. However, what does this test really tell us about the president's mental health?

Developed in the early 2000s at Montreal's McGill University by a group of researchers, the Montreal Cognitive Assessment (MoCA) is a simple paper-and-pencil test meant to detect mild cognitive impairment and cognitive degenerative diseases such as Alzheimer's. It takes about 10 to 12 minutes to complete and is indicated

Preview

Switch to Standard View

Convergent Evidence of Brain Overconnectivity in Children with Autism?

Jeffrey David Rudie, Mirella Dapretto

DOI: http://dx.doi.org/10.1016/j.celrep.2013.10.043

Altmetric 3 0

Summary | Full Text | Images/Data | References | Related Articles

In this issue of *Cell Reports*, Keown et al. and Supekar et al. report widespread increases in brain connectivity in children with autism. These studies challenge the widely established theory of underconnectivity in autism, suggesting a more complicated picture of brain connectivity alterations.

Linked Articles

Brain Hyperconnectivity in Children with Autism and its Links to Social Deficits
Article
Menon and colleagues
Cell Reports, Vol. 5, Issue 3, p738–747
Summary | Full-Text HTML | PDF | Supp. Info.

Local Functional Overconnectivity in Posterior Brain Regions Is Associated with Symptom Severity in A Spectrum Disorders
Report
Müller and colleagues
Cell Reports, Vol. 5, Issue 3, p567–572
Summary | Full-Text HTML | PDF | Supp. Info.

But not all neural networks are structurally the same.

Personal perturbations in Neuroscience, Technology and Education

1970: Teaching Reading with Jeanne Chall

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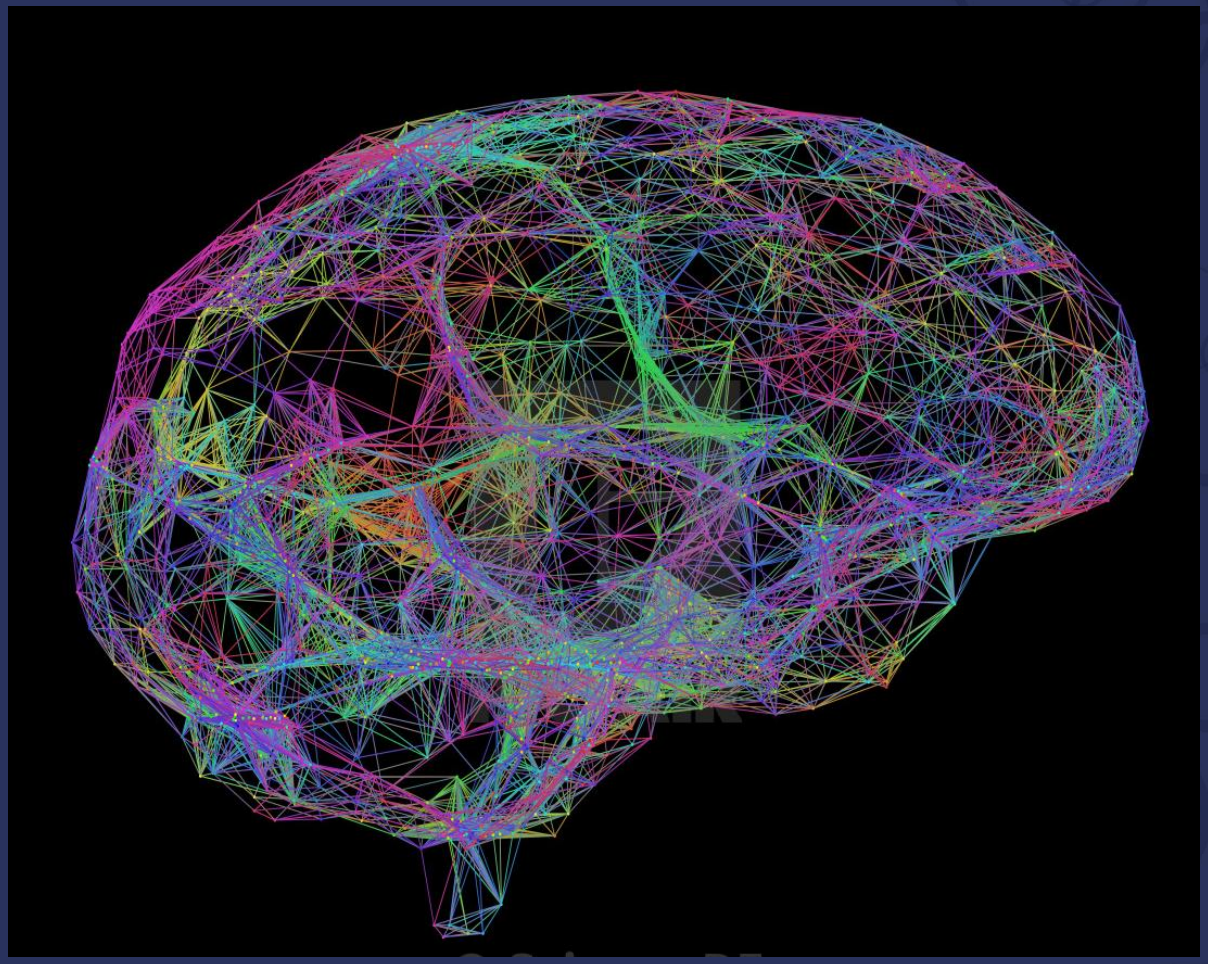
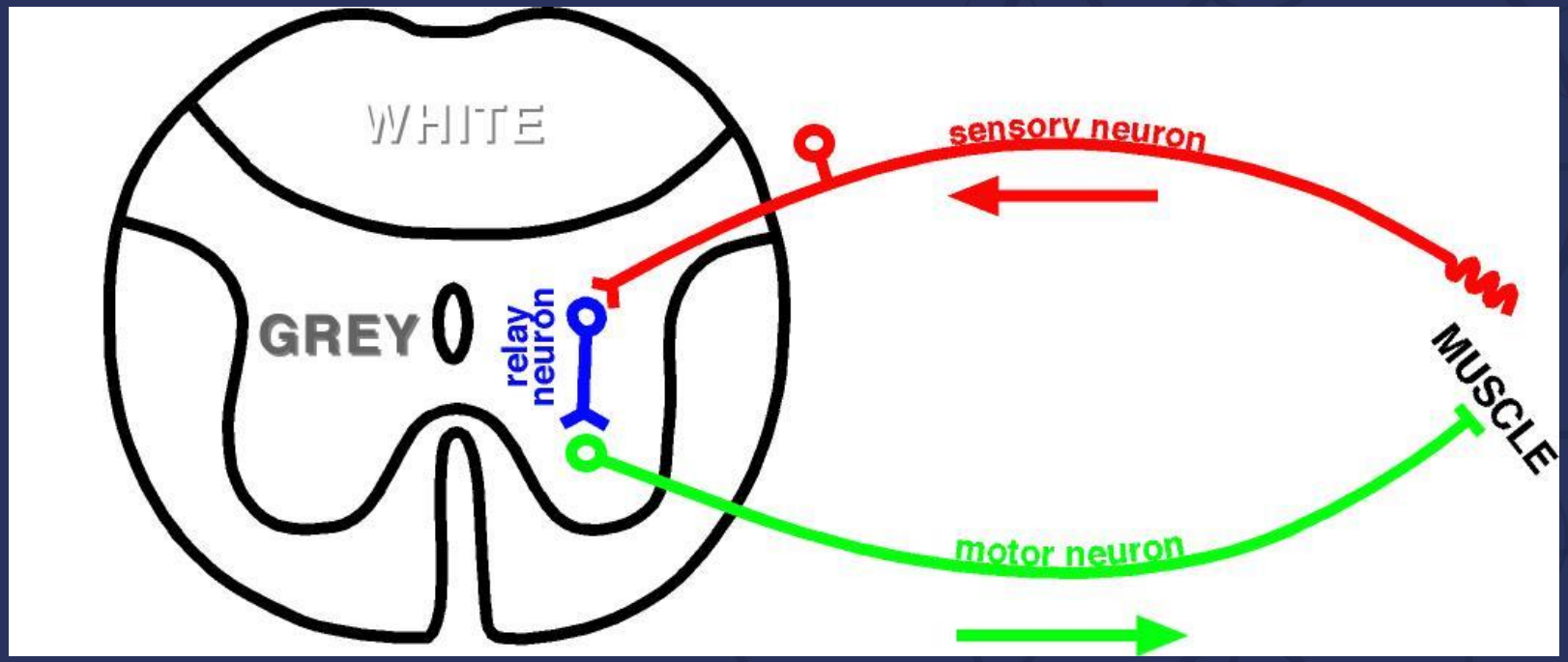
1974: Discovering Neurogenesis in the Hippocampus

Exploiting the Neural Networks at Harvard (and MIT)



The Simplest Neural Network



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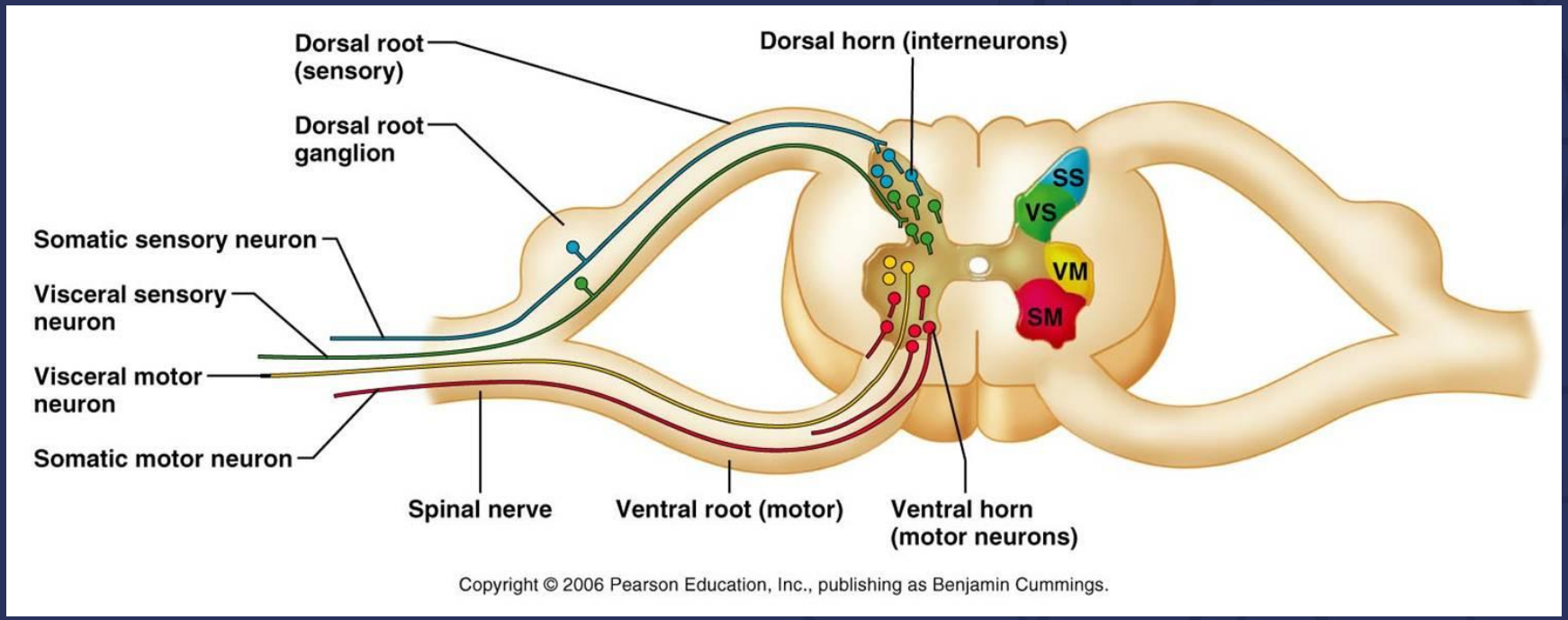
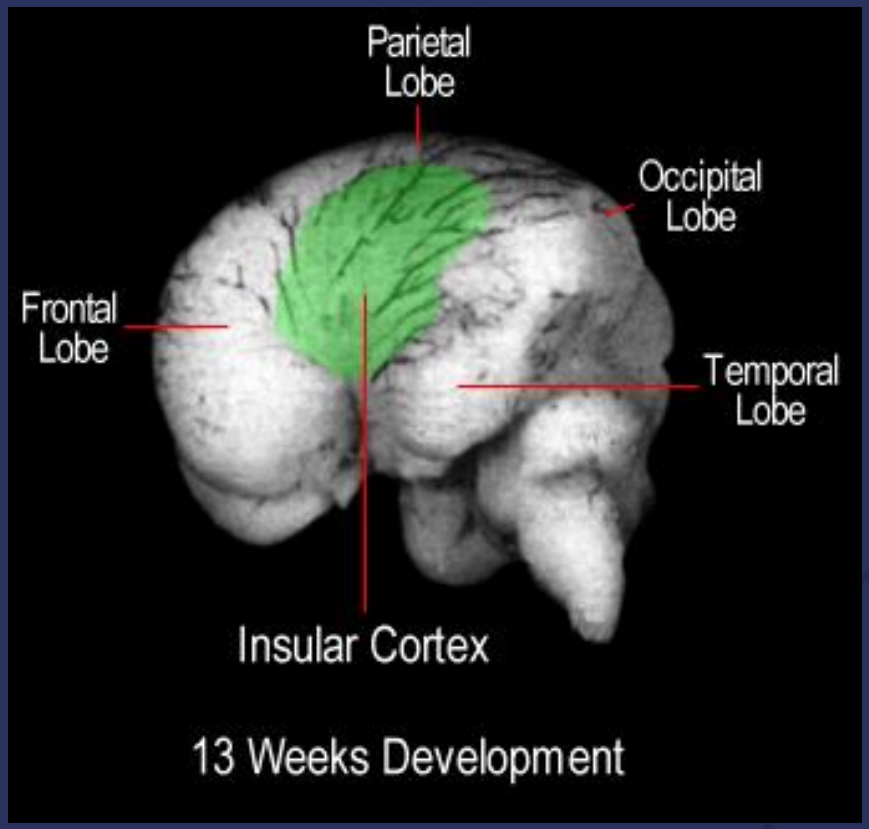
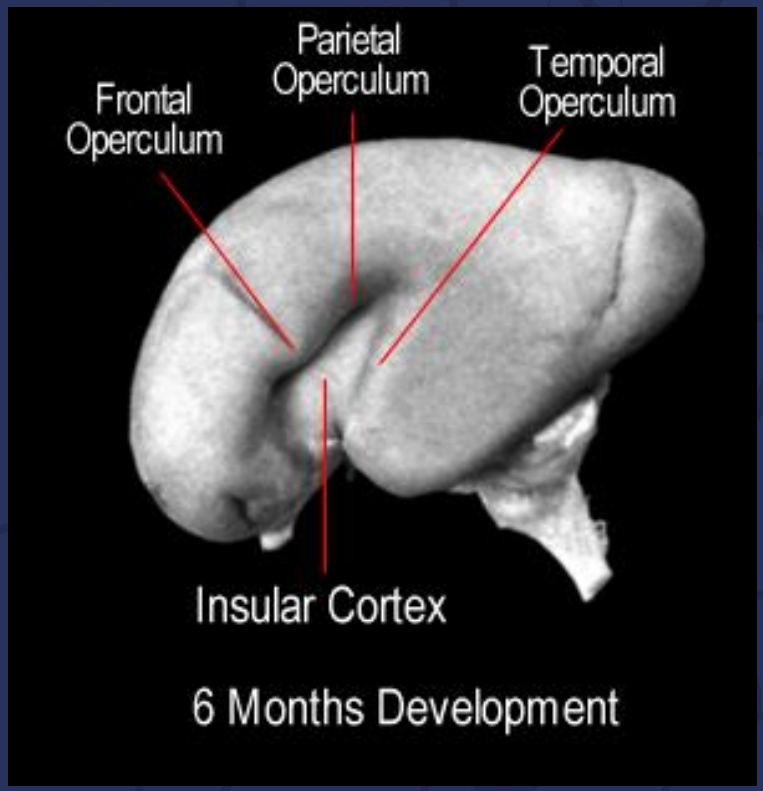
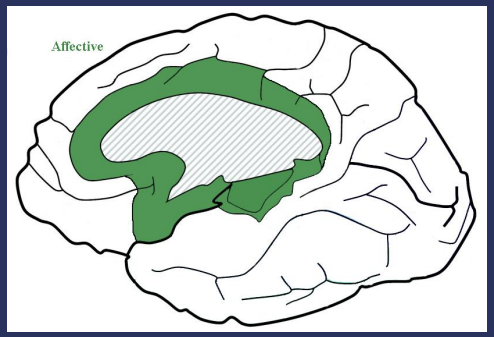
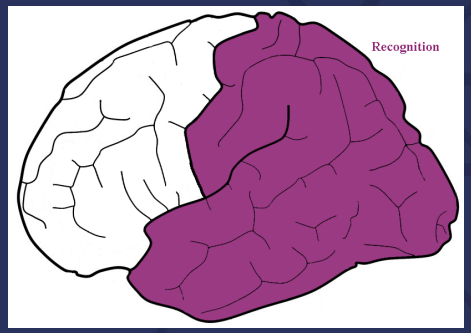


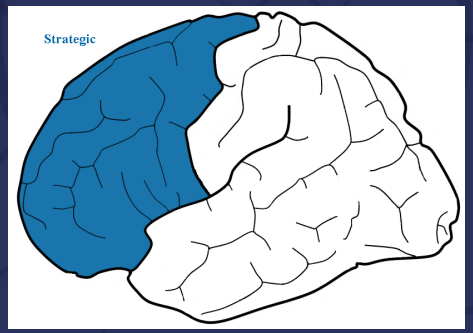

Parietal Lobe
Occipital Lobe
Frontal Lobe
Temporal Lobe
Insular Cortex
13 Weeks Development


Frontal Operculum
Parietal Operculum
Temporal Operculum
Insular Cortex
6 Months Development

The Same Three Divisions Occupy the same spatial locations in Neocortex

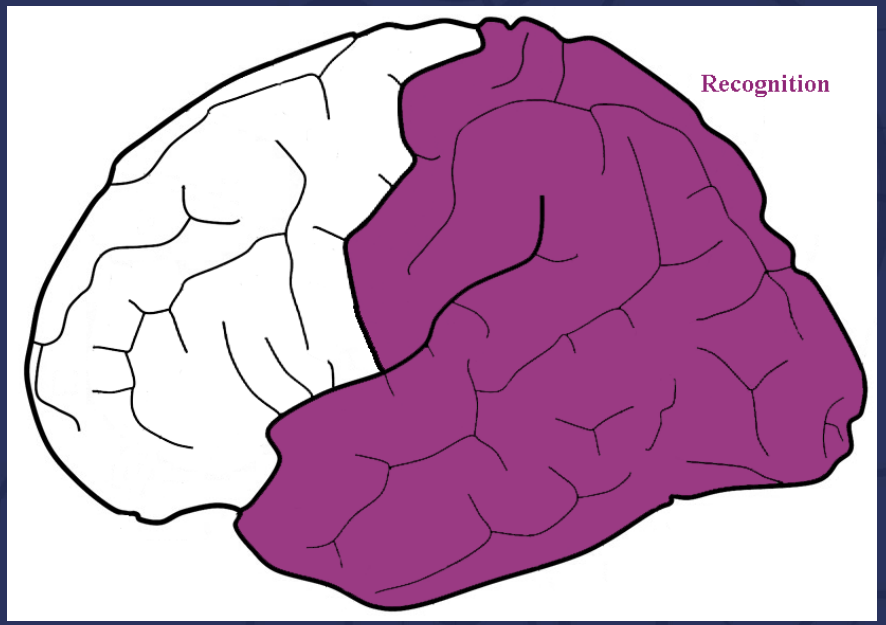






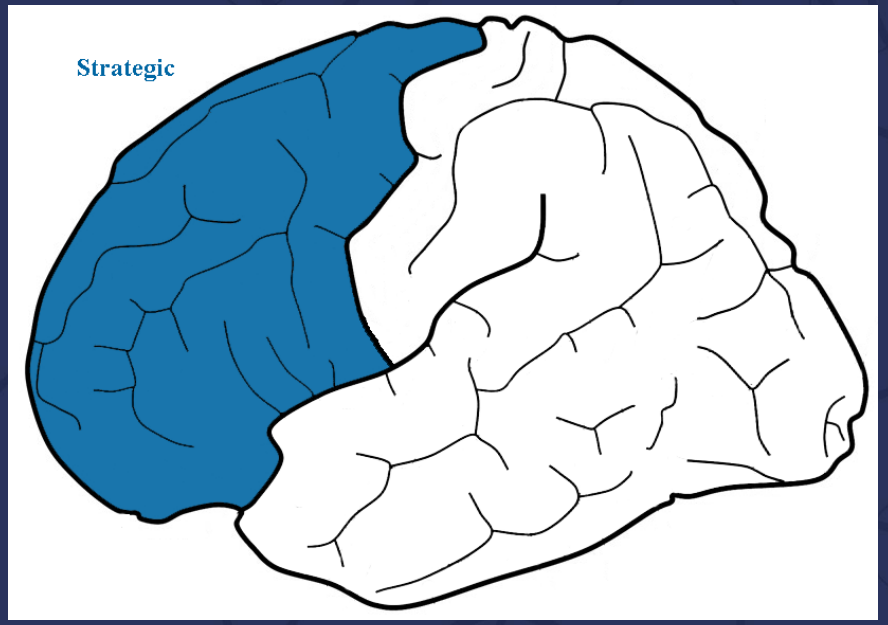
Recognition Networks
What's that?

Perceive,
understand,
and remember
information from
the environment



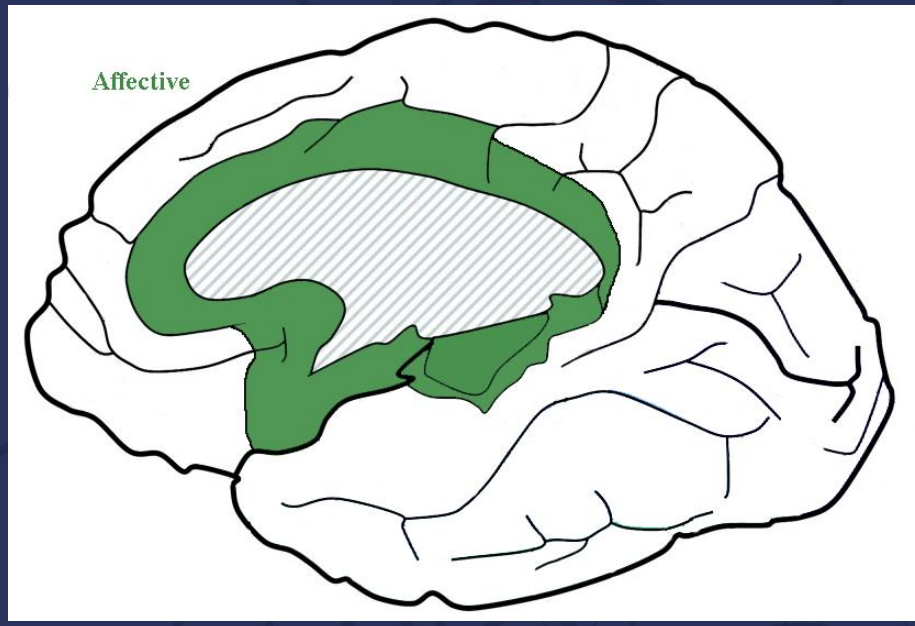
Strategic (Frontal) Cortex
How to DO that?

Planning, organizing and executing skillful actions in the environment

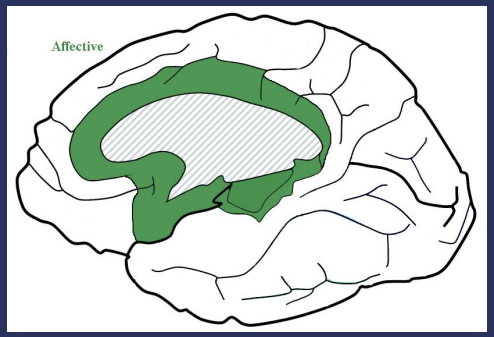


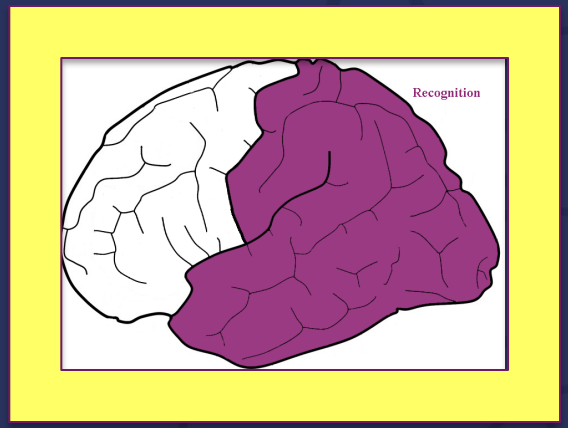
Affective (Emotional) Networks
What's Important?

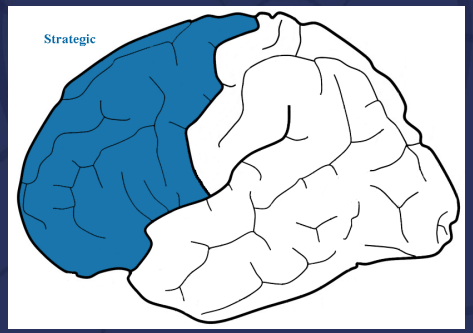
Setting priorities for planning, attending, searching, choosing, remembering.



Addressing the Spectra of Individual Differences The UDL Framework and Principles

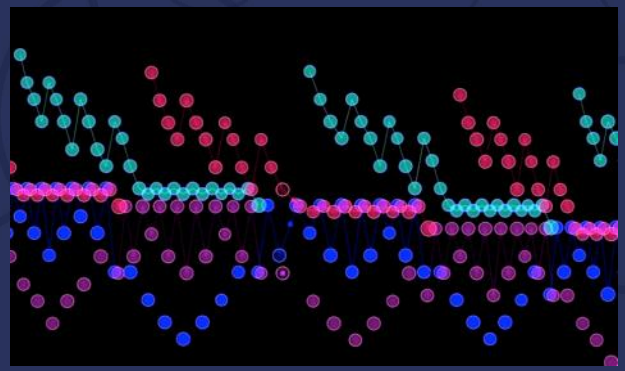






..and designing learning activities that meet the challenge of diversity

I. Provide Multiple Means of Representation	II. Provide Multiple Means of Action and Expression	III. Provide Multiple Means of Engagement
Perception	Physical action	Recruiting interest
Language, expressions, and symbols	Expression and communication	Sustaining effort and persistence
Comprehension	Executive function	Self-regulation



by reducing barriers for some and increasing options for all

I. Provide Multiple Means of Representation	II. Provide Multiple Means of Action and Expression	III. Provide Multiple Means of Engagement
Perception	Physical action	Recruiting interest
Language, expressions, and symbols	Expression and communication	Sustaining effort and persistence
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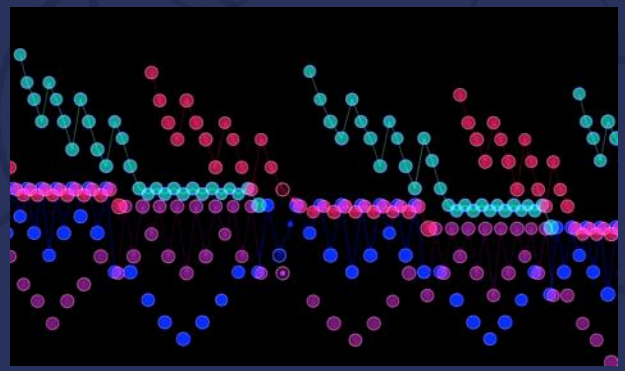


Provide Multiple Means of
Engagement

Purposeful, motivated learners

Provide options for self-regulation
- Promote expectations and beliefs that optimize motivation
- Facilitate personal coping skills and strategies
- Develop self-assessment and reflection

Provide options for sustaining effort and persistence
- Heighten salience of goals and objectives
- Vary demands and resources to optimize challenge
- Foster collaboration and community
- Increase mastery-oriented feedback

Provide options for recruiting interest
- Optimize individual choice and autonomy
- Optimize relevance, value, and authenticity
- Minimize threats and distractions

Provide Multiple Means of
Representation

Resourceful, knowledgeable learners

Provide options for comprehension
- Activate or supply background knowledge
- Highlight patterns, critical features, big ideas, and relationships
- Guide information processing, visualization, and manipulation
- Maximize transfer and generalization

Provide options for language, mathematical expressions, and symbols
- Clarify vocabulary and symbols
- Clarify syntax and structure
- Support decoding of text, mathematical notation, and symbols
- Promote understanding across languages
- Illustrate through multiple media

Provide options for perception
- Offer ways of customizing the display of information
- Offer alternatives for auditory information
- Offer alternatives for visual information

Provide Multiple Means of
Action & Expression

Strategic, goal-directed learners

Provide options for executive functions
- Guide appropriate goal-setting
- Support planning and strategy development
- Enhance capacity for monitoring progress

Provide options for expression and communication
- Use multiple media for communication
- Use multiple tools for construction and composition
- Build fluencies with graduated levels of support for practice and performance

Provide options for physical action
- Vary the methods for response and navigation
- Optimize access to tools and assistive technologies

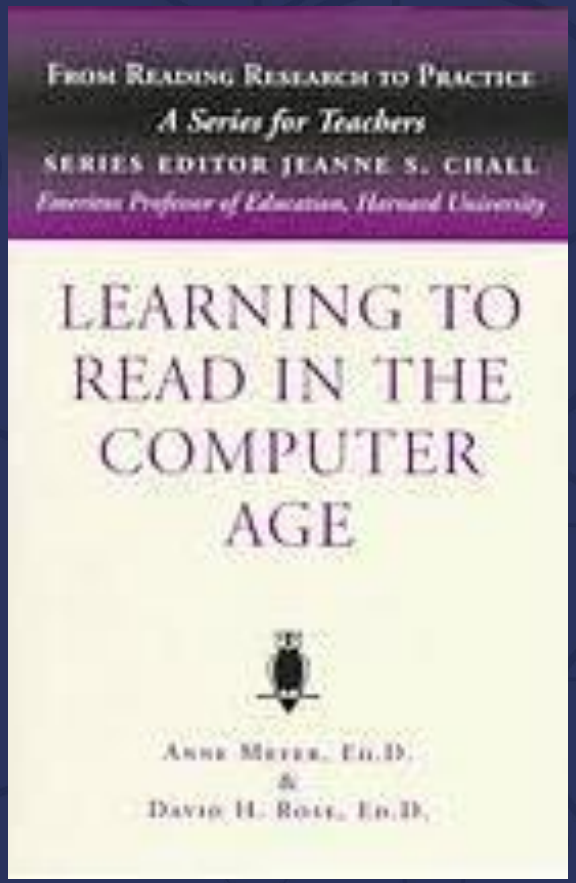
Personal perturbations in Neuroscience, Technology and Education

1970: Teaching Reading with Jeanne Chall

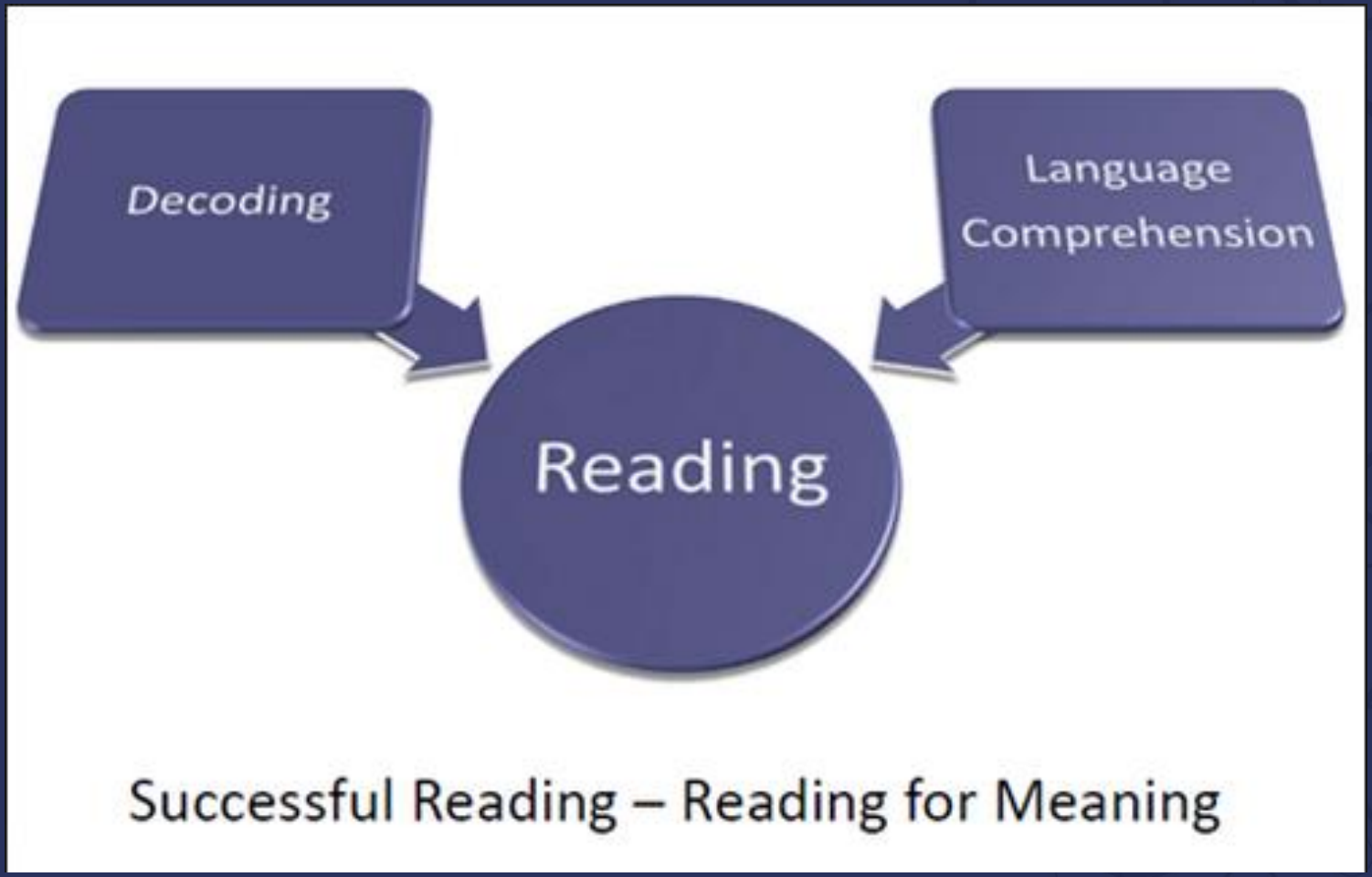
1972: Exploiting the Neural Networks of Harvard

1974: Discovering Neurogenesis in the Hippocampus

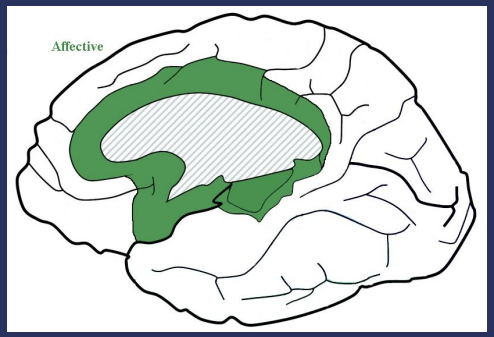
Comprehending reading with Jeanne Chall and the Cortex

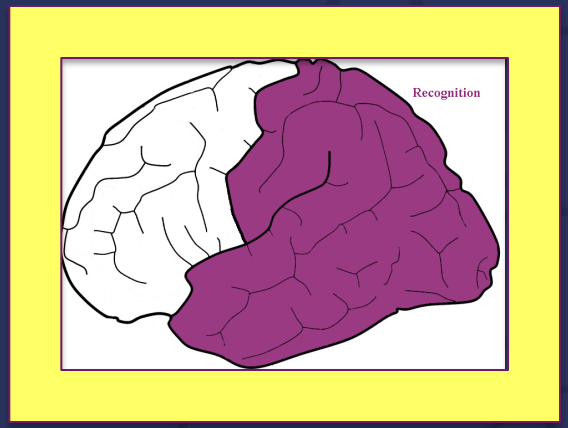


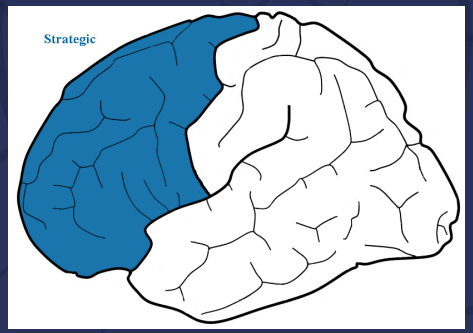
The “Simple” view of Reading

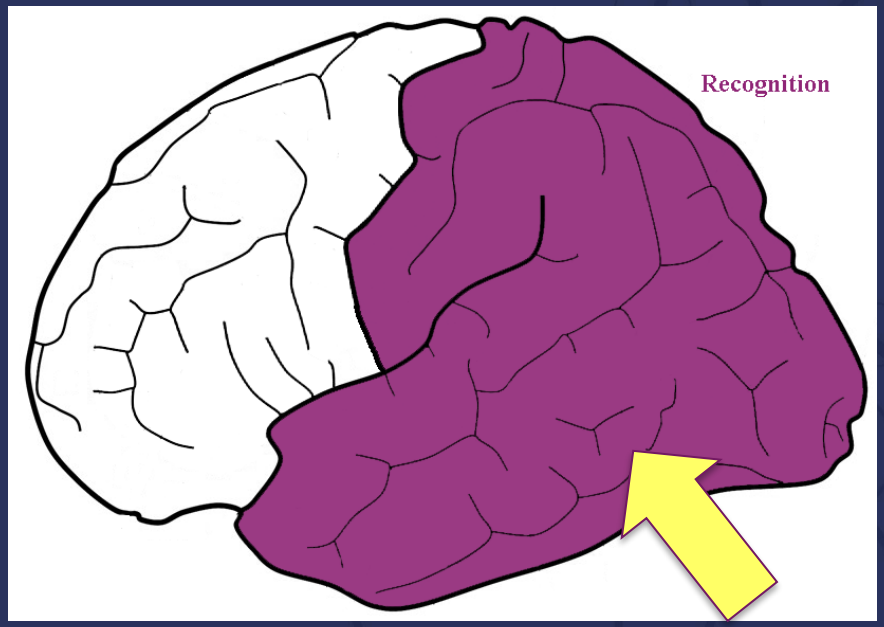


But reading really requires extensive involvement of areas on all three networks



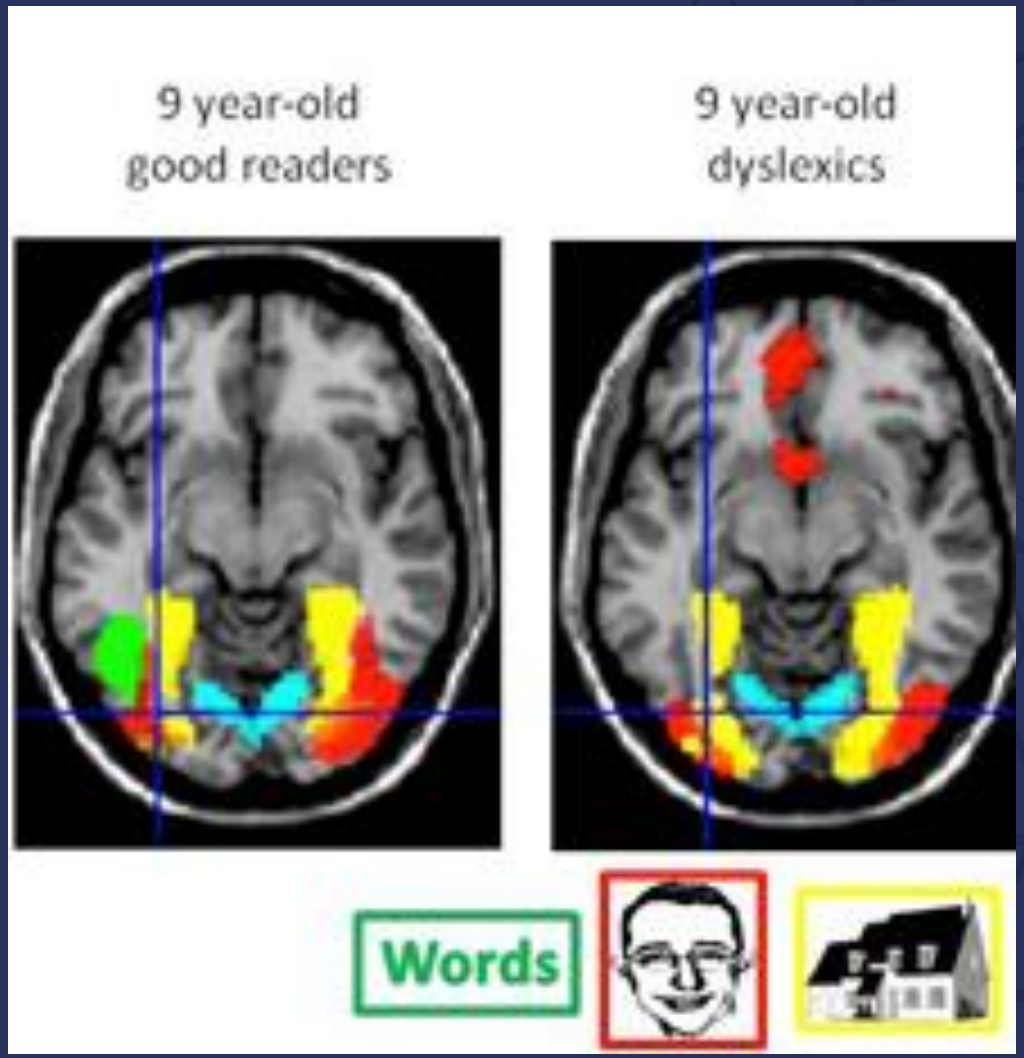




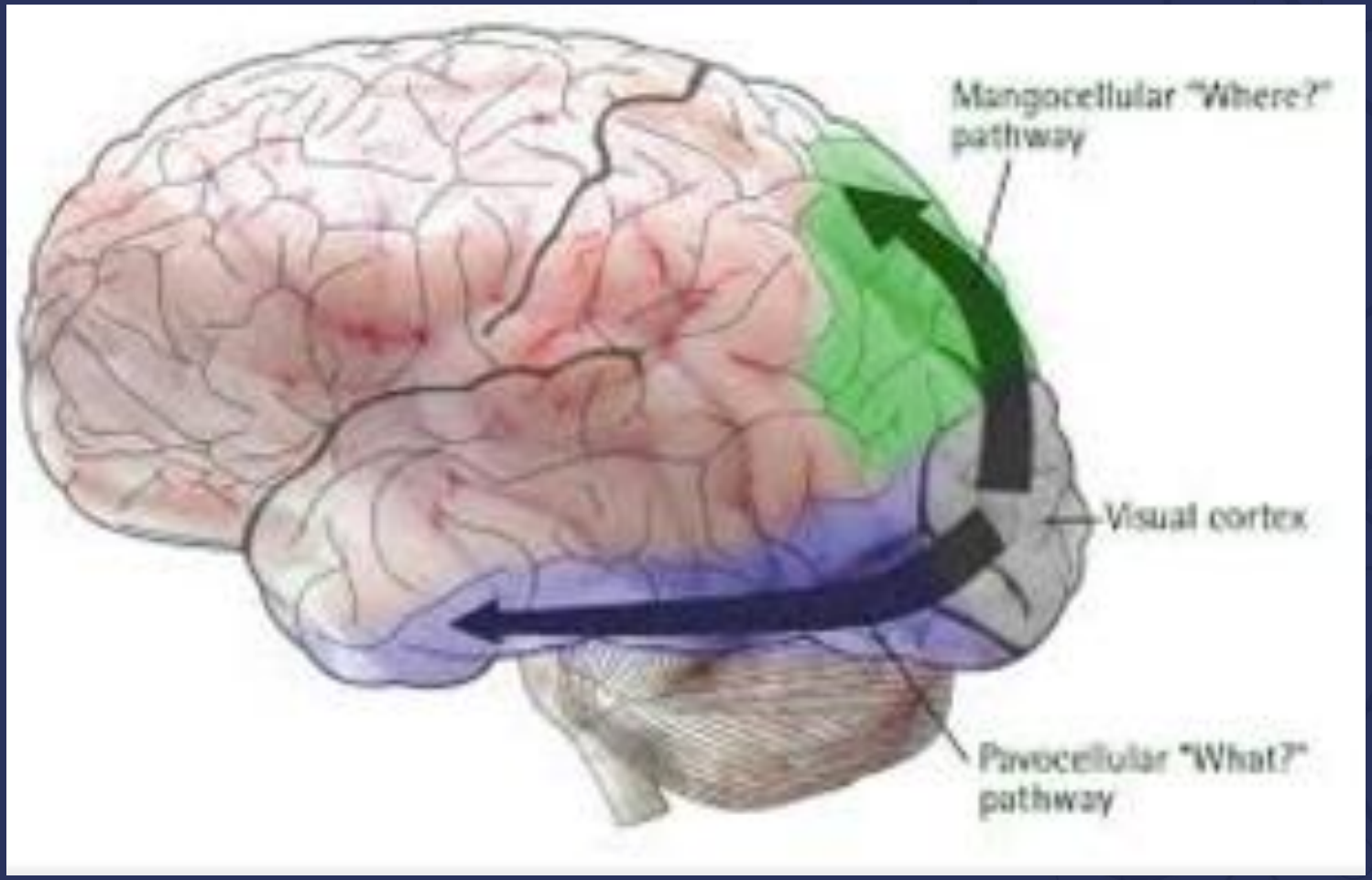


Visual Word Form Area

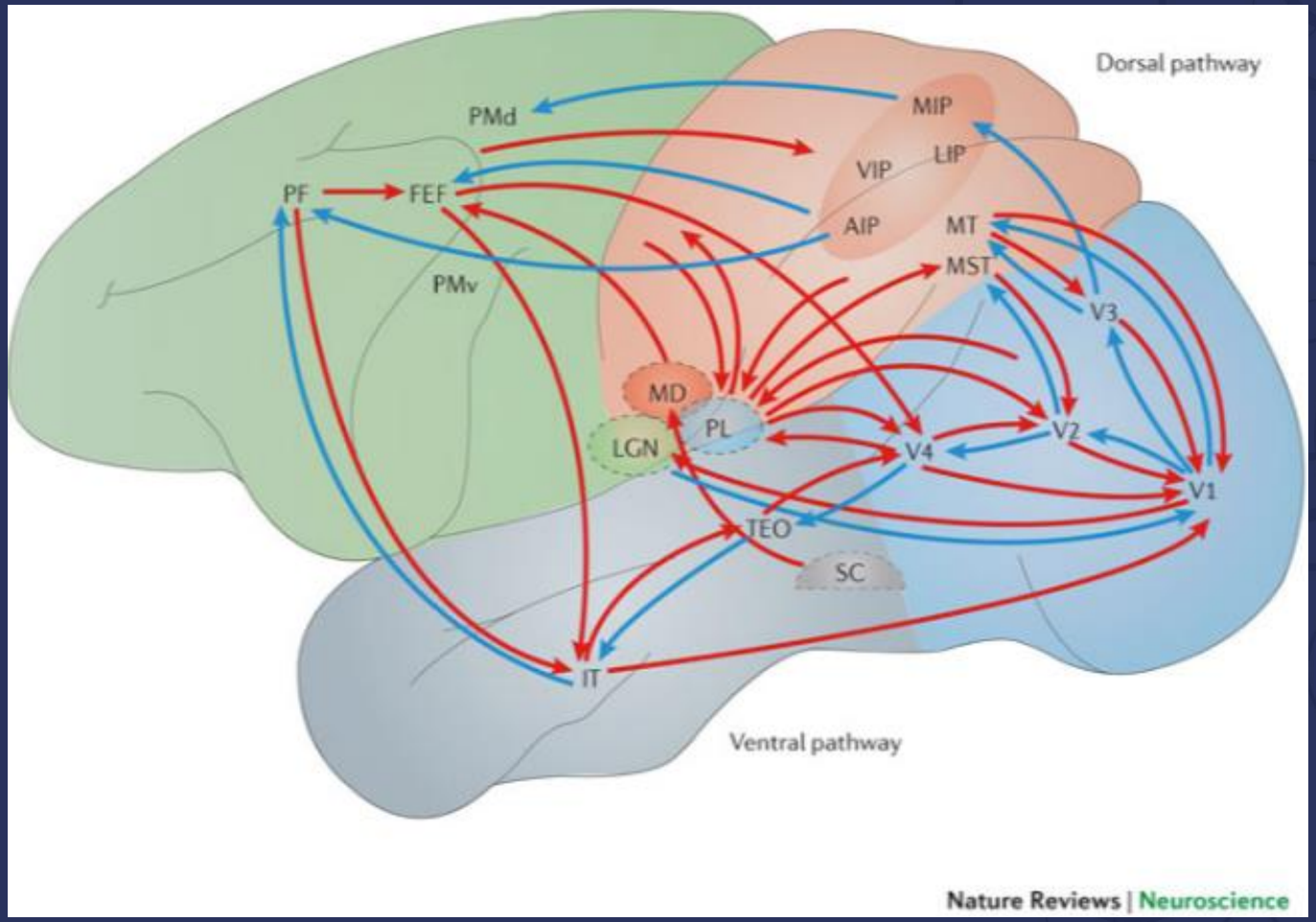
Decoding words in the Brain



Old view: Bottom Up

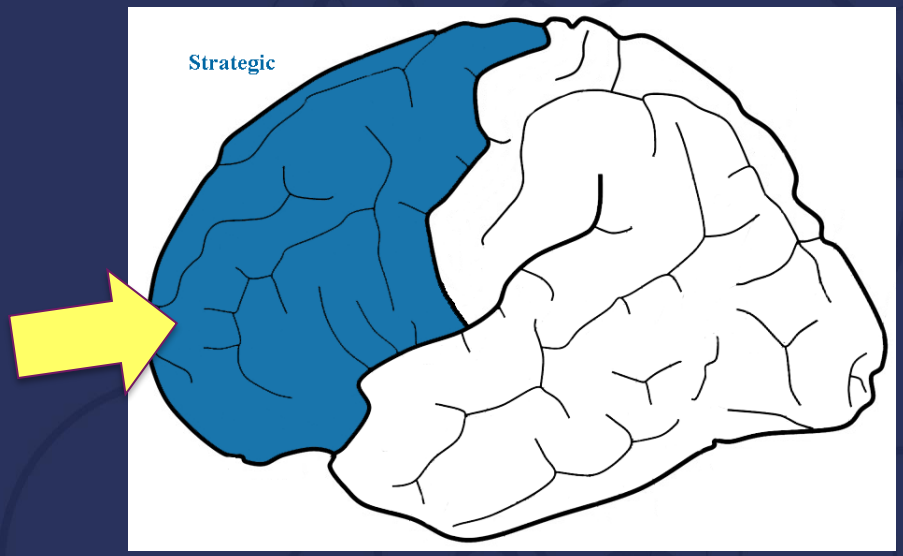


New View: Reciprocal Networks



For emaxlpe, it deson’t mttaer in waht oredr the ltteers in a wrod aepapr, the olny iprmoatnt tihng is taht the frist and lsat ltteer are in the rghit pcale. The rset can be a toatl mses and you can sitll raed it wouthit pobelrm.

S1M1L4RLY, Y0UR M1ND 15 R34D1NG 7H15 4U70M471C4LLY W17H0U7 3V3N 7H1NK1NG 4B0U7 17.

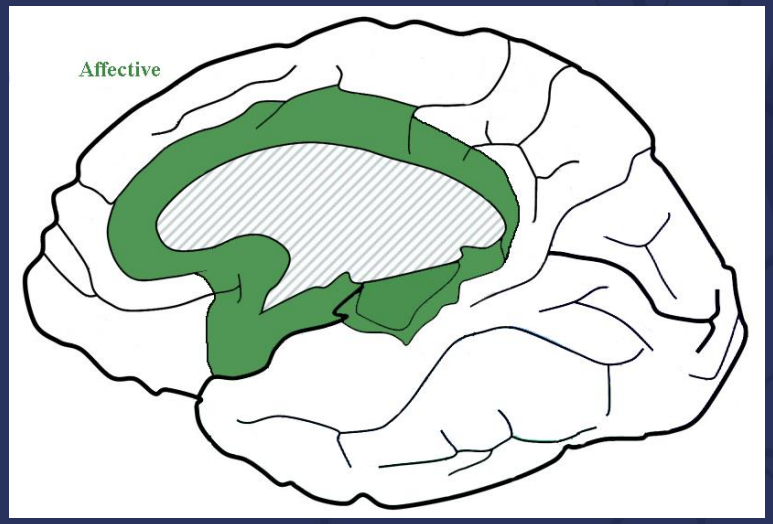

Strategic

All strategy, no decoding…

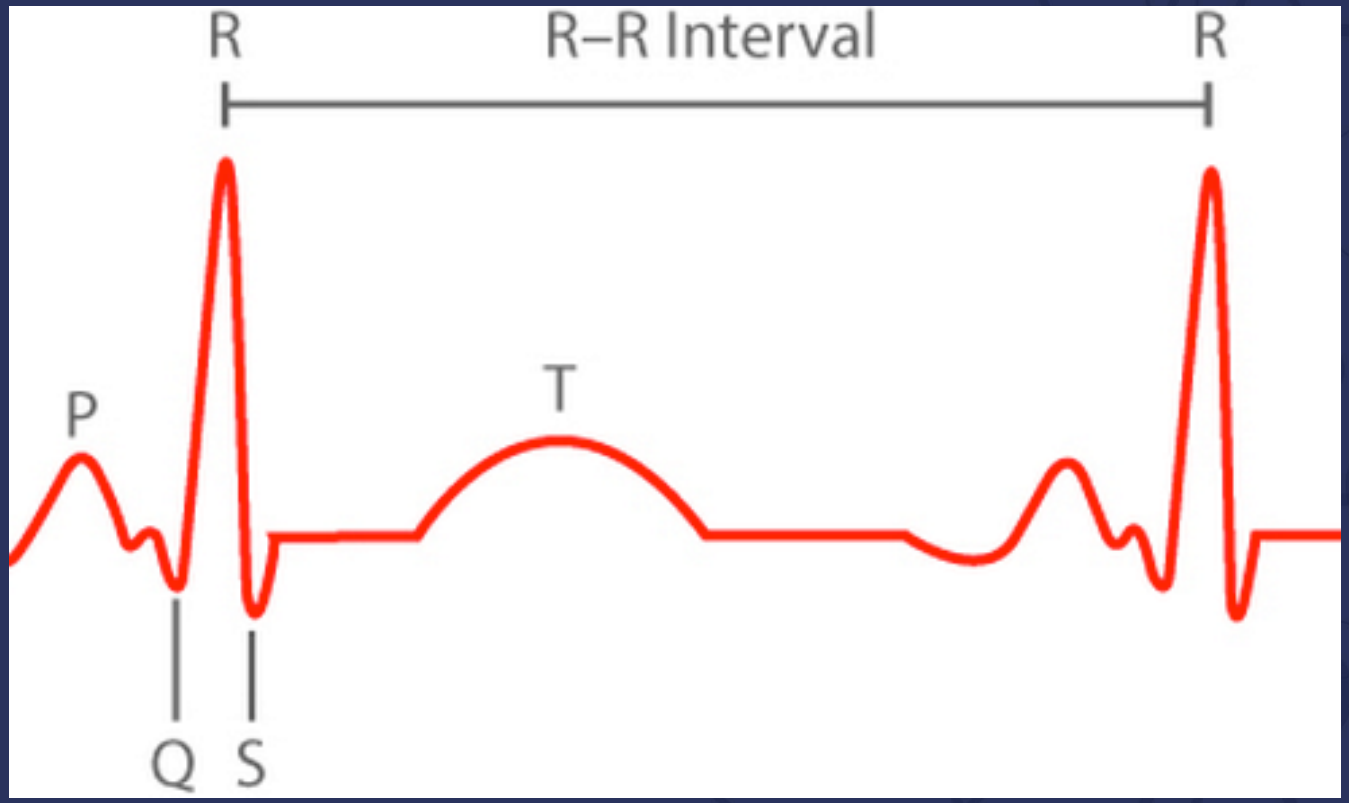
Scientific Studies of Reading
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/hssr20

Comprehending the Gray Oral Reading Test Without Reading It: Why Comprehension Tests Should Not Include Passage-Independent Items

Janice M. Keenan & Rebecca S. Betjemann
Version of record first published: 19 Nov 2009.


Affective

Sami daley



Students with reading disabilities are in threat states when asked to read

	Mean Heart Rate at Baseline	SD
LD (n=21)	85.2	11.6
Non-LD (n=53)	77.5	11.9

t=-2.54, p=.02

Daley, S. (2015).

Which brings us back to the reading brain…

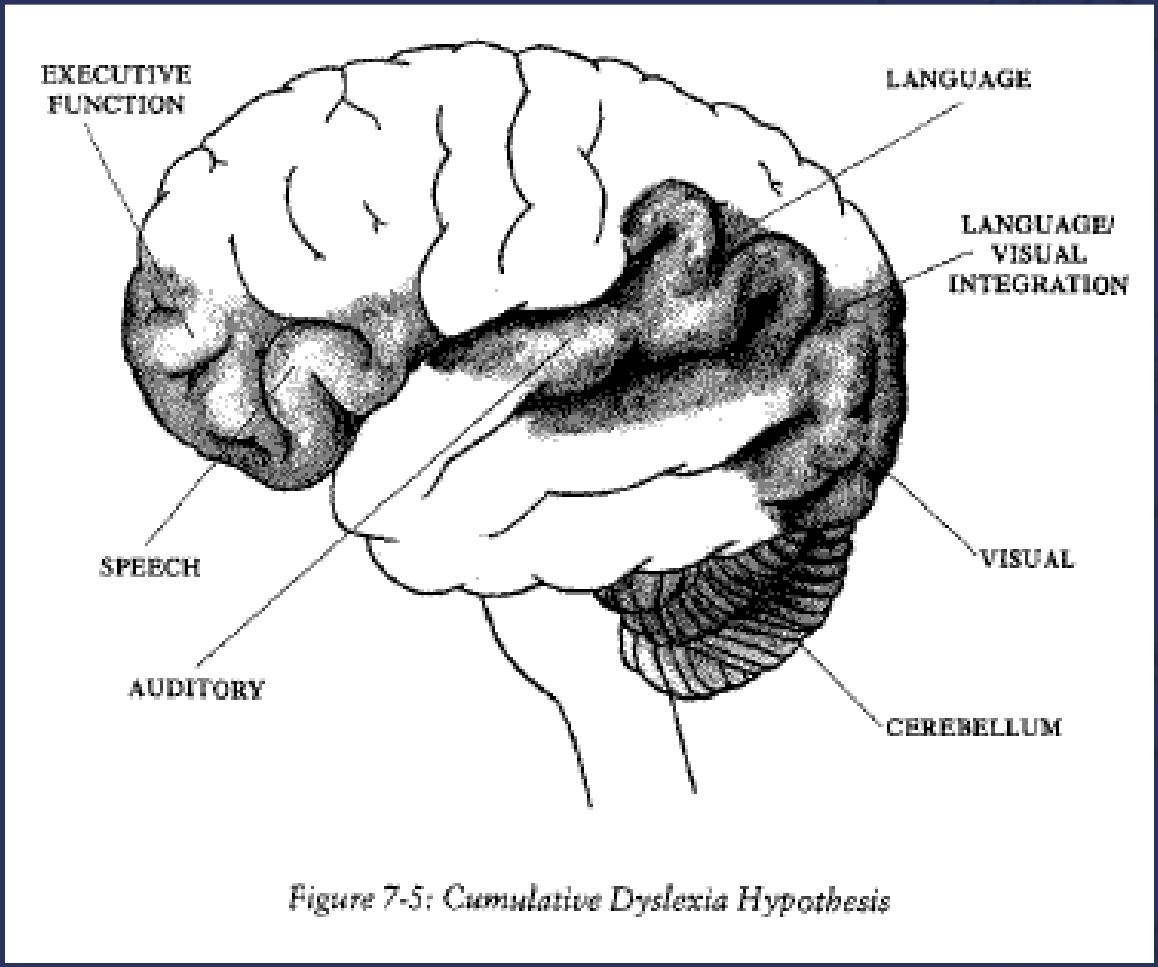
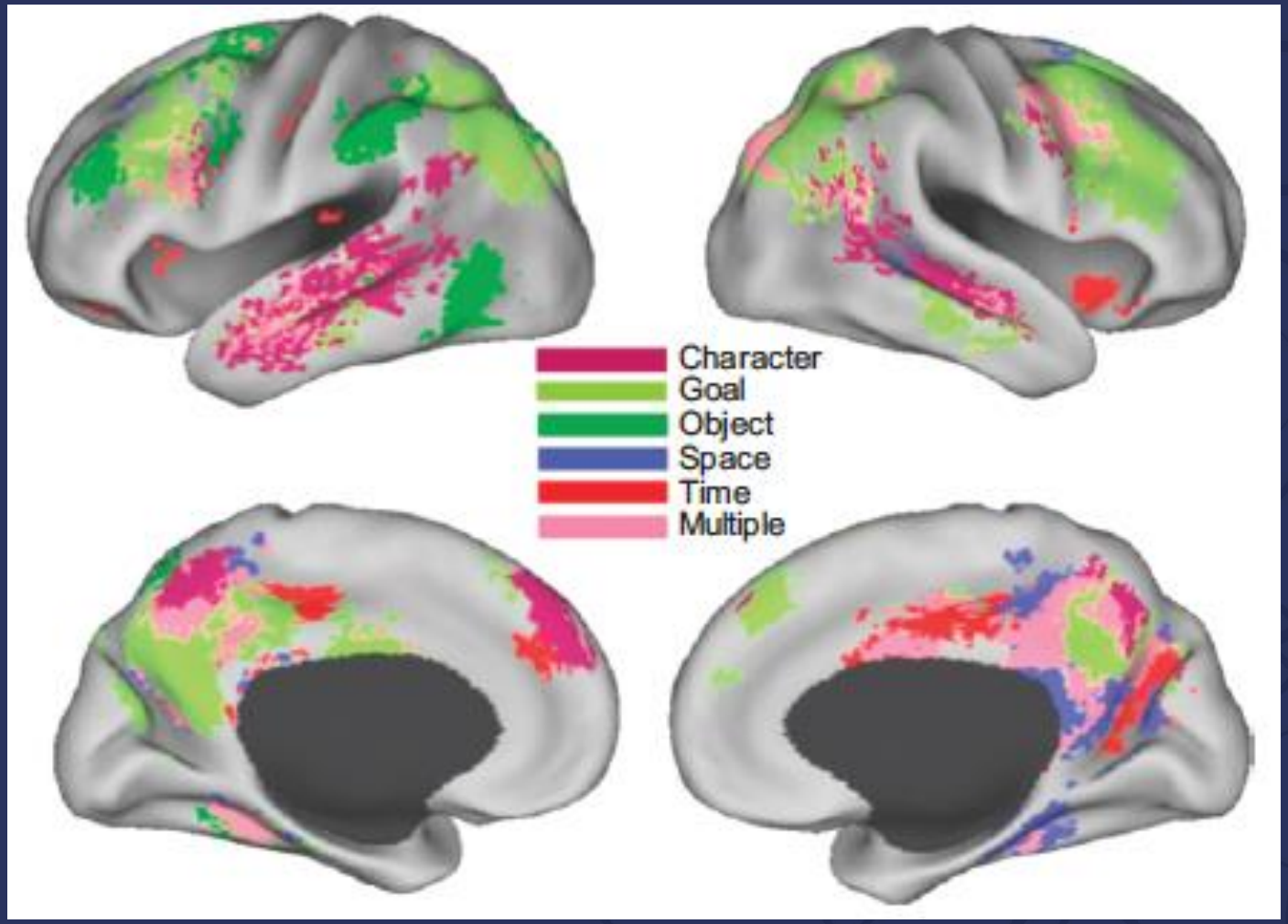


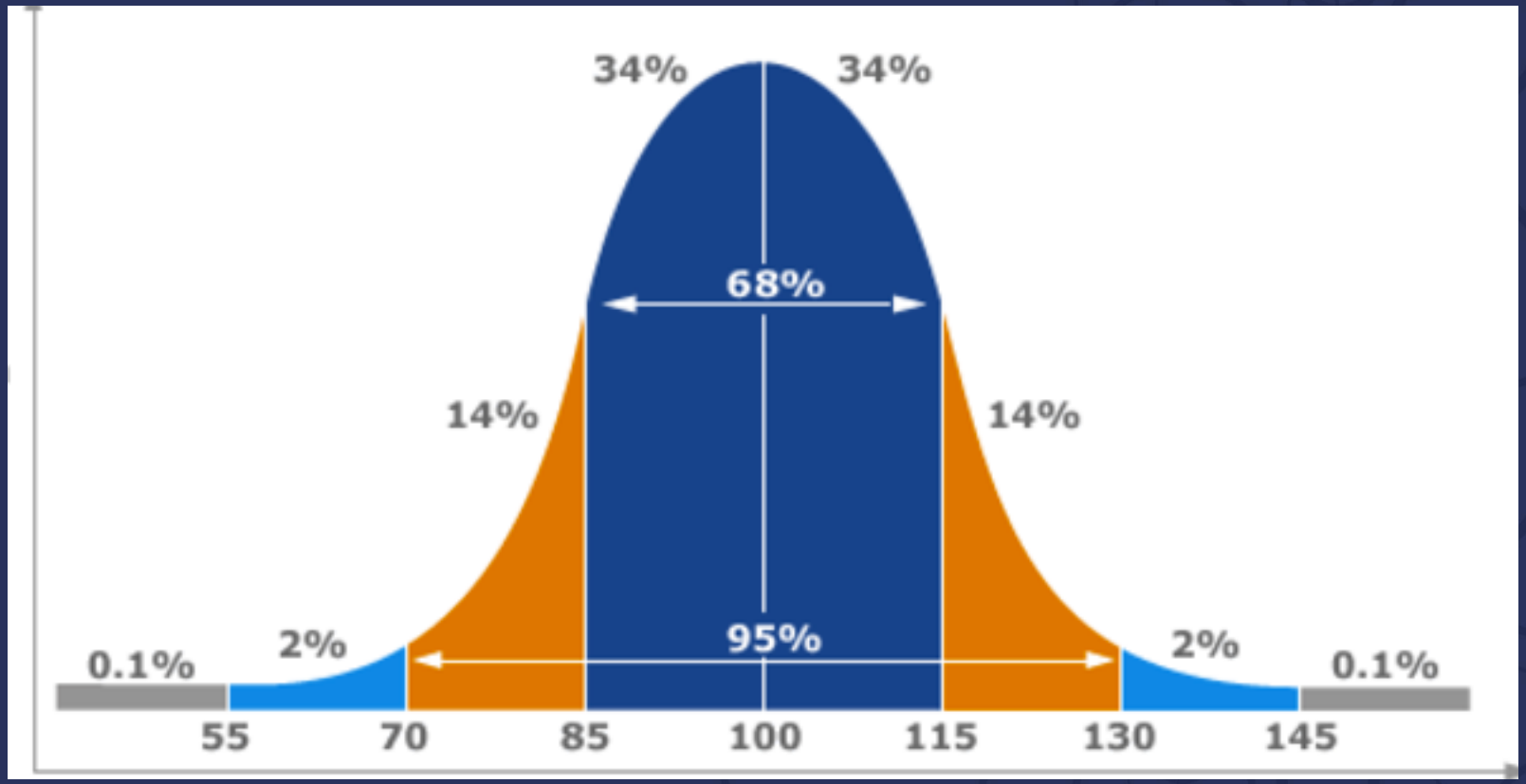
Figure 7-5: Cumulative Dyslexia Hypothesis

Wolf, M. (2007). *Proust and the Squid*. pp.176



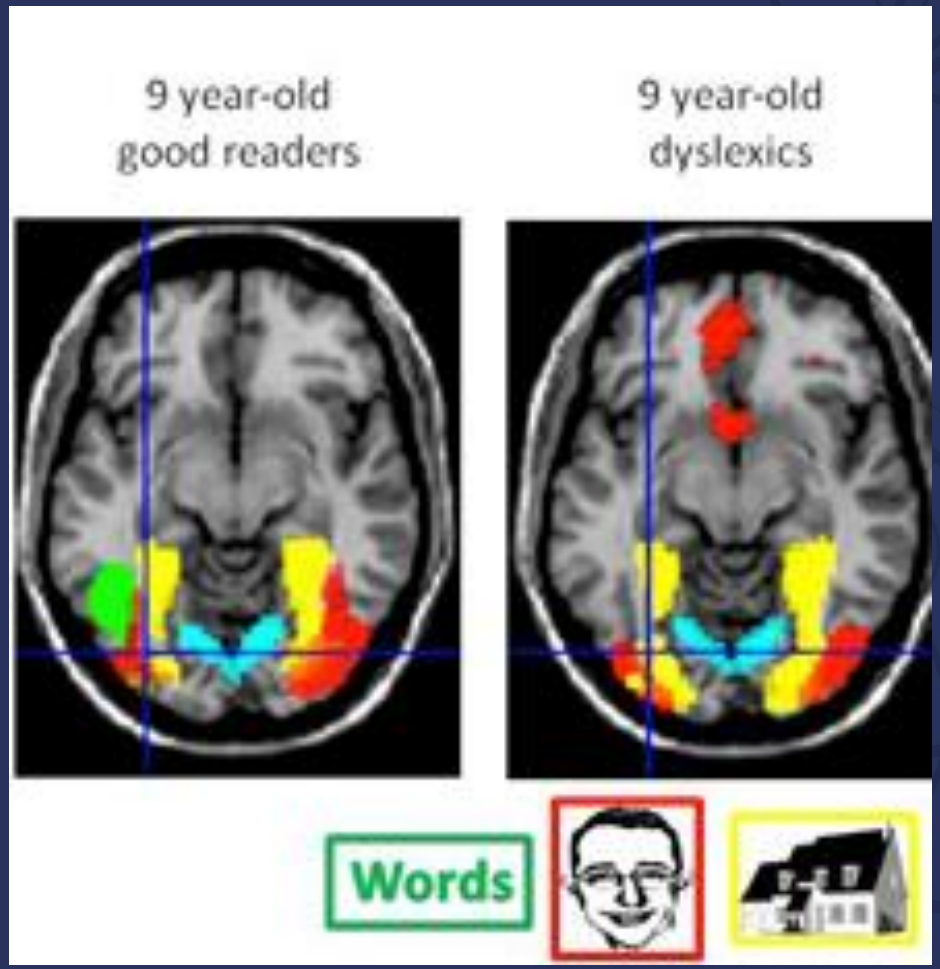
Reading Stories Activates Neural Representations of Visual and Motor Experiences. Nicole K. Speer, Jeremy R. Reynolds, Khena M. Swallo (2014)

The “reading” Spectrum

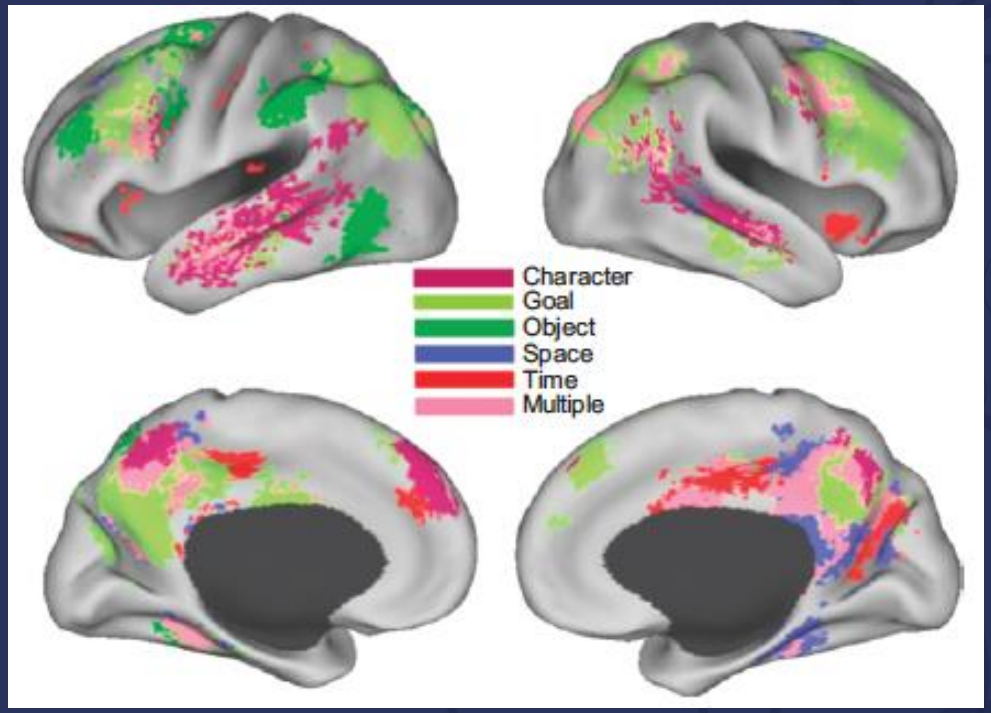


Hyperlexia Dyslexia Alexia

Rigorous and sustained training can sculpt the decoding chip

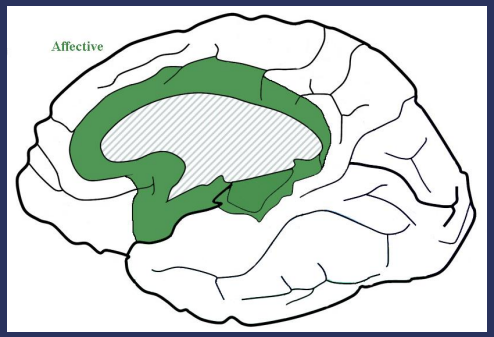


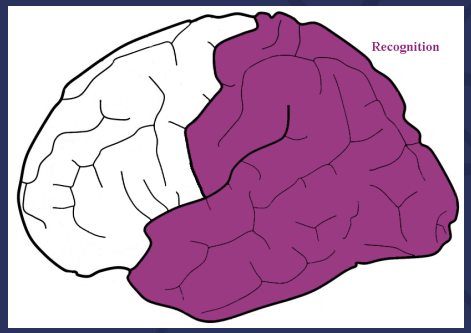
But what are the side-effects of rigorous treatment?

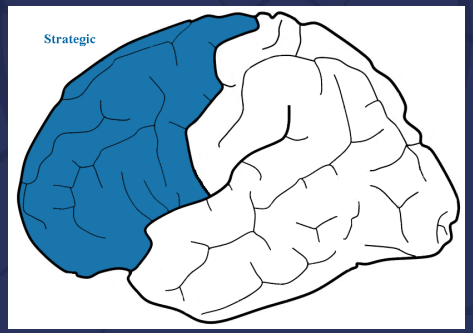


Emotional as well as Cognitive

Effective Reading Requires all Three Networks







And because individuals vary dramatically in their capabilities within each, there is not one kind of reader, or one kind of reading.

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Personal perturbations in Neuroscience, Technology and Education

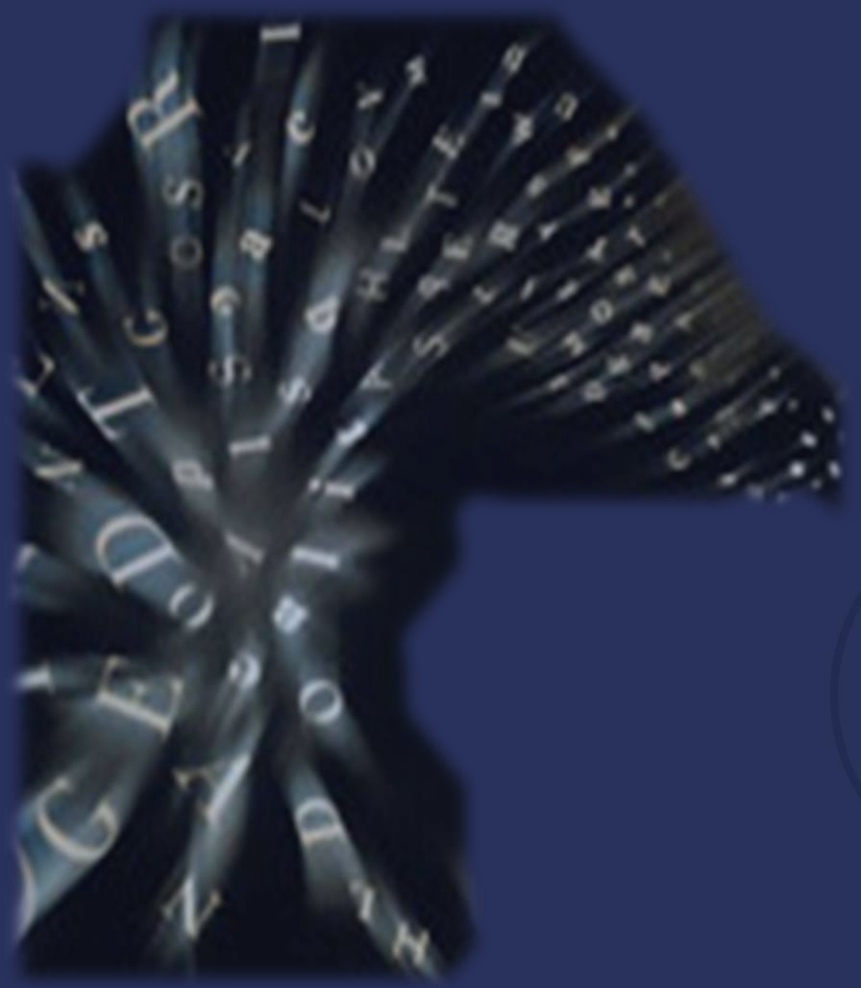
1983-86: Canaries in the Mine at NSCH

1984-92: Disruptive Technologies at CAST

1988: Stumbling on architecture with Ron Mace

A Foundation for Flexibility

Multiple Representations



A Tale of Two Cities

It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of

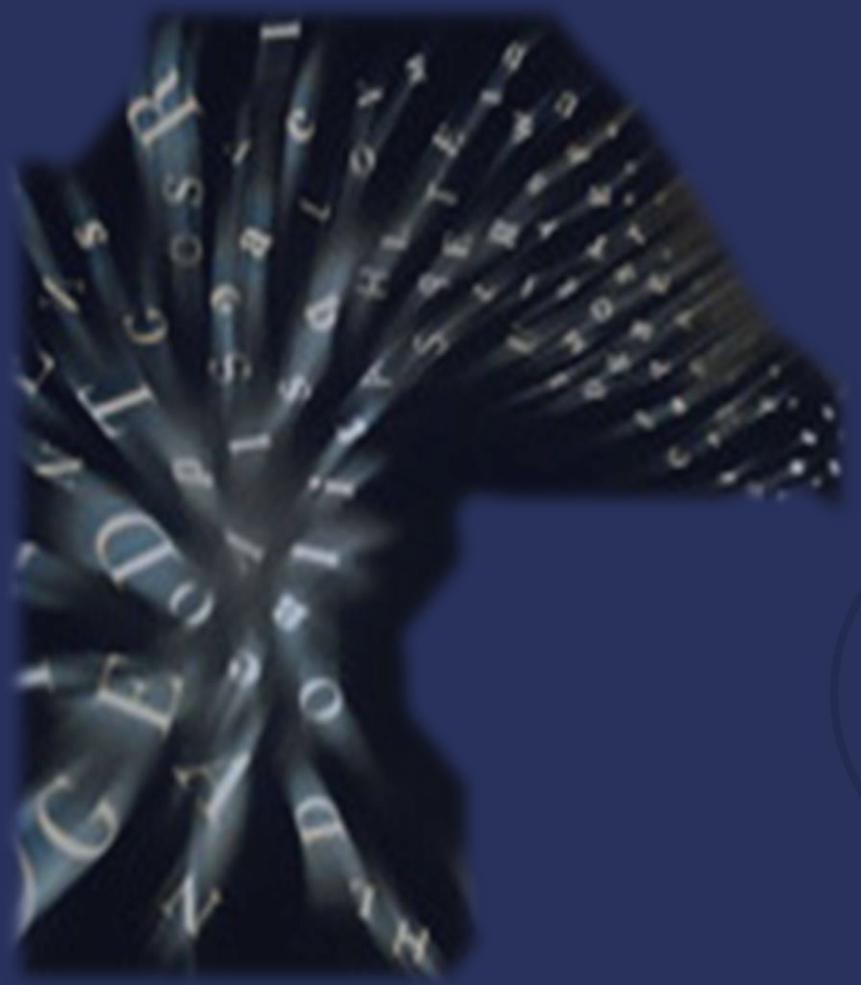
A Tale of Two Cities

It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season

दो शहरों की कहानी

यह समय का सबसे अच्छा था, यह समय का सबसे बुरा था, यह ज्ञान की उम्र थी, यह मूर्खता की उम्र का था, यह विश्वास का युग था, यह अविश्वास का युग था, यह मौसम का था

Flexible Display: Multiple Representations



A Tale of Two Cities

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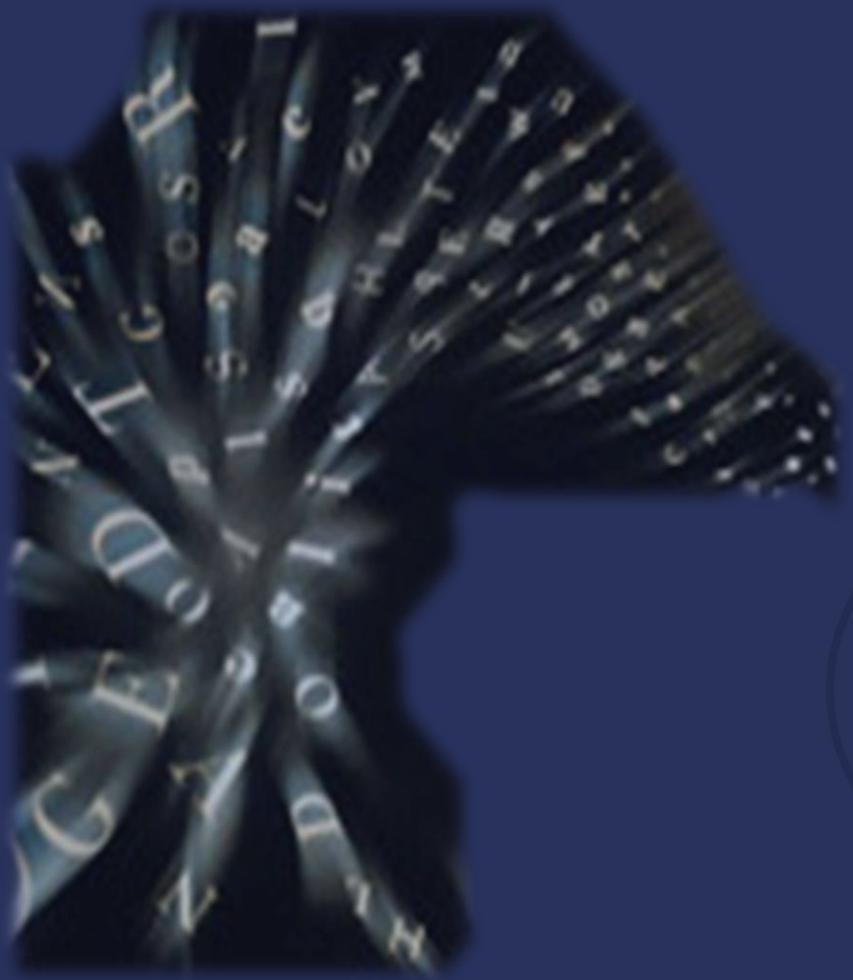
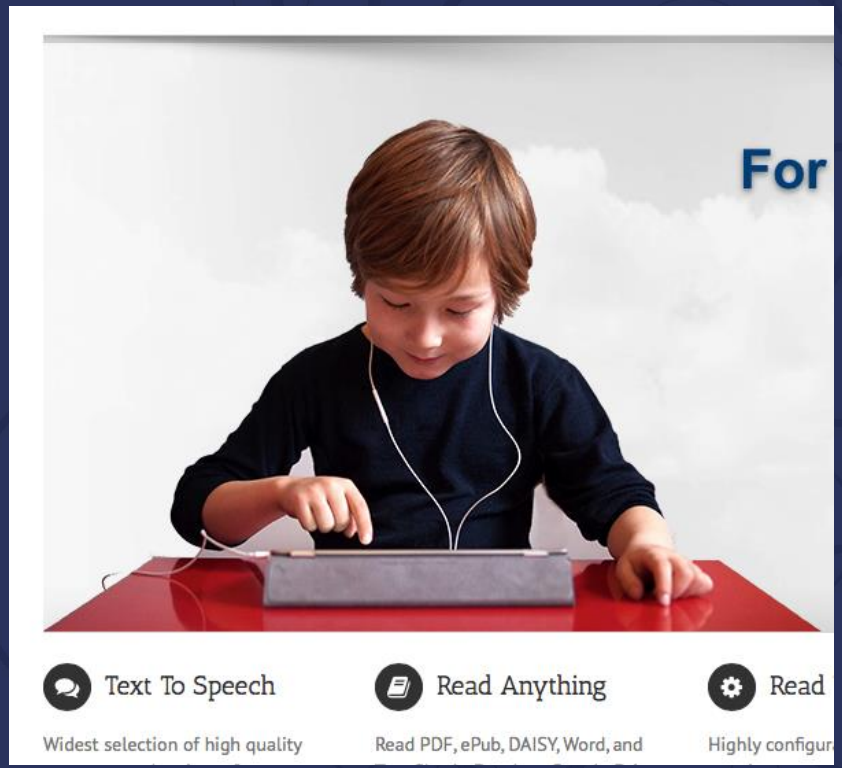
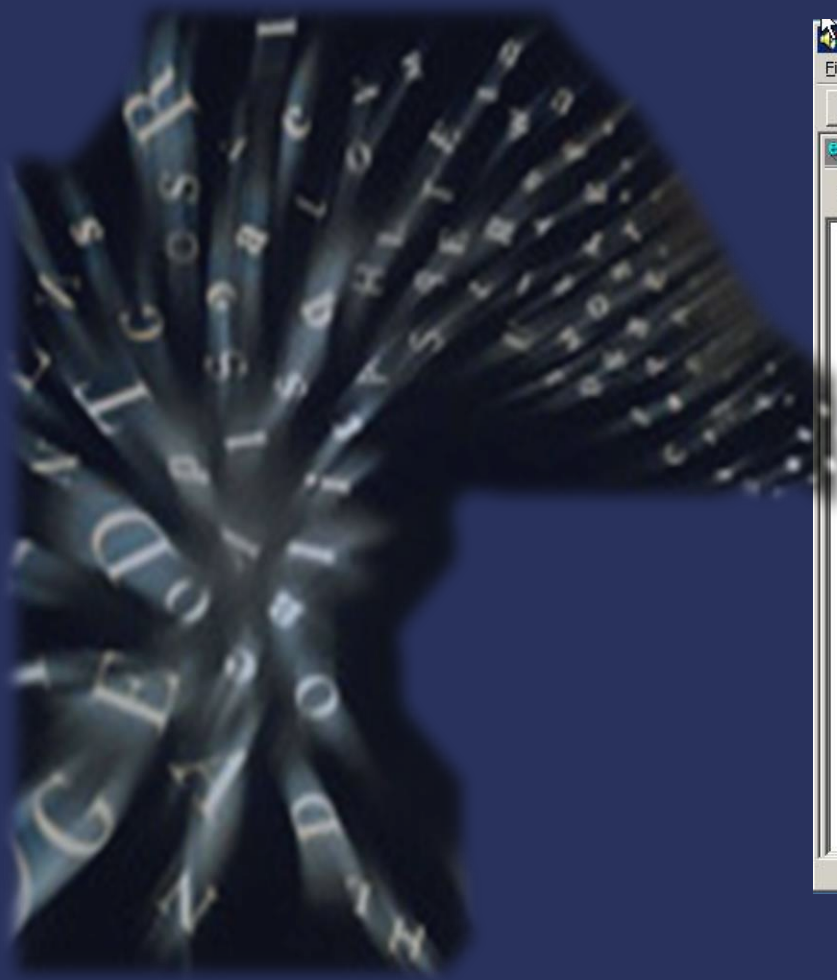
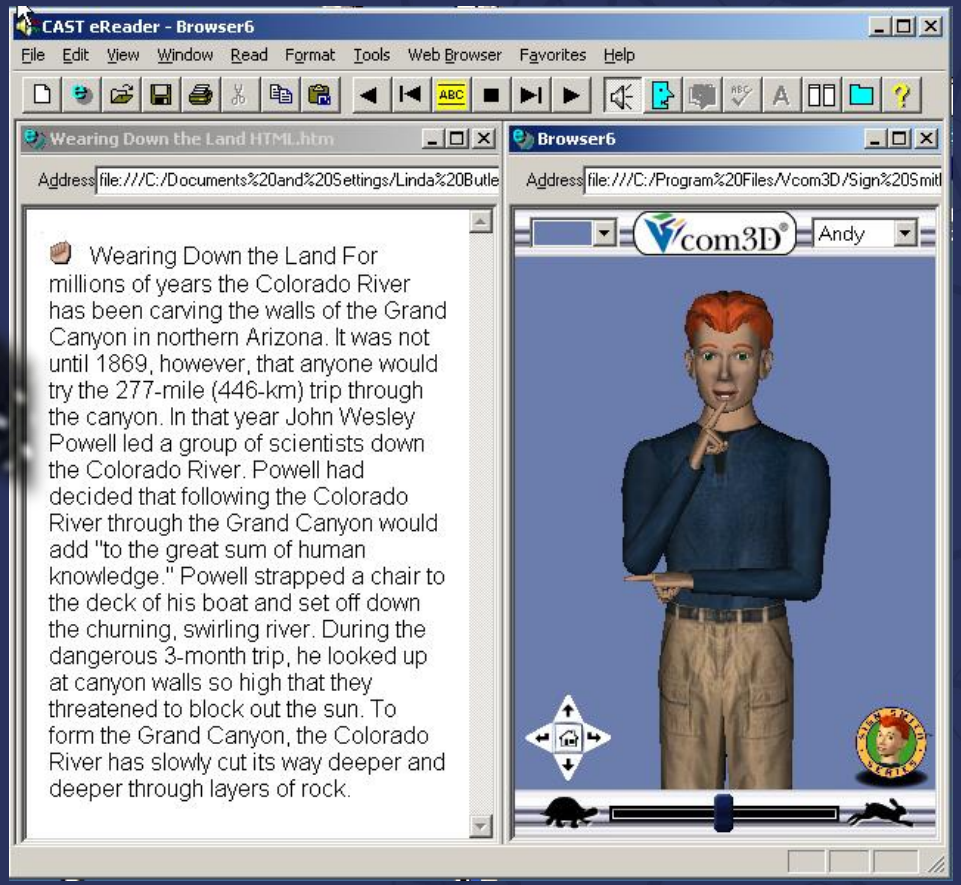
Flexible Display: Multiple Representations





Flexible Display: Multiple Representations





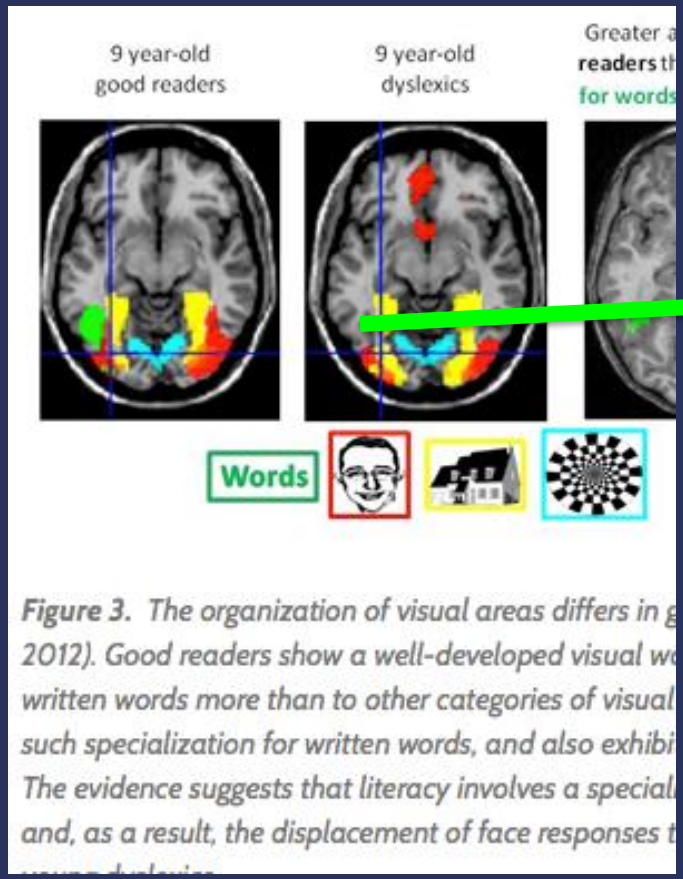
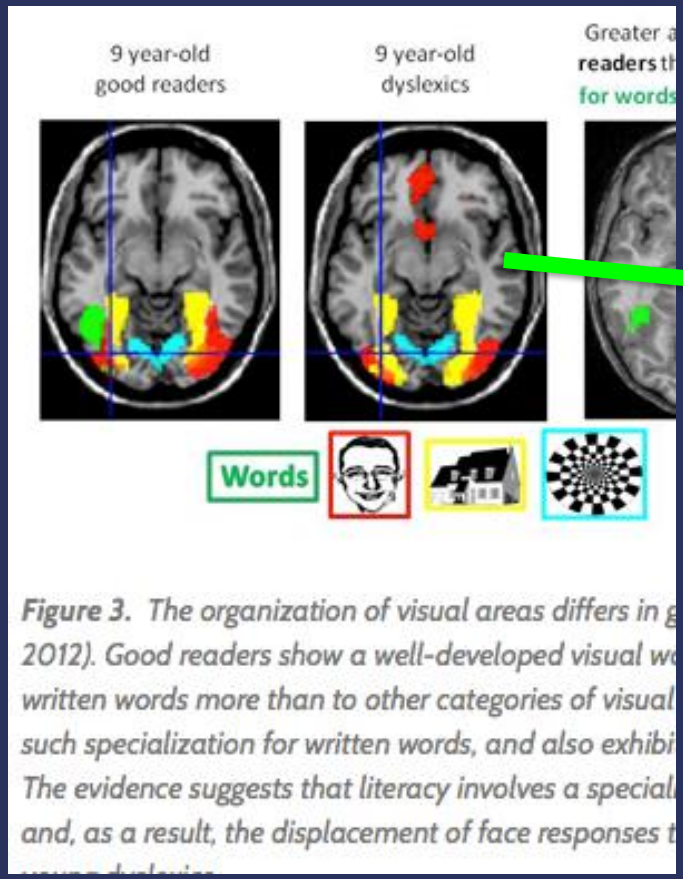


Figure 3. The organization of visual areas differs in g
2012). Good readers show a well-developed visual w
written words more than to other categories of visual
such specialization for written words, and also exhibi
The evidence suggests that literacy involves a special
and, as a result, the displacement of face responses t

Alternatives for decoding

e.g. audio assisted reading



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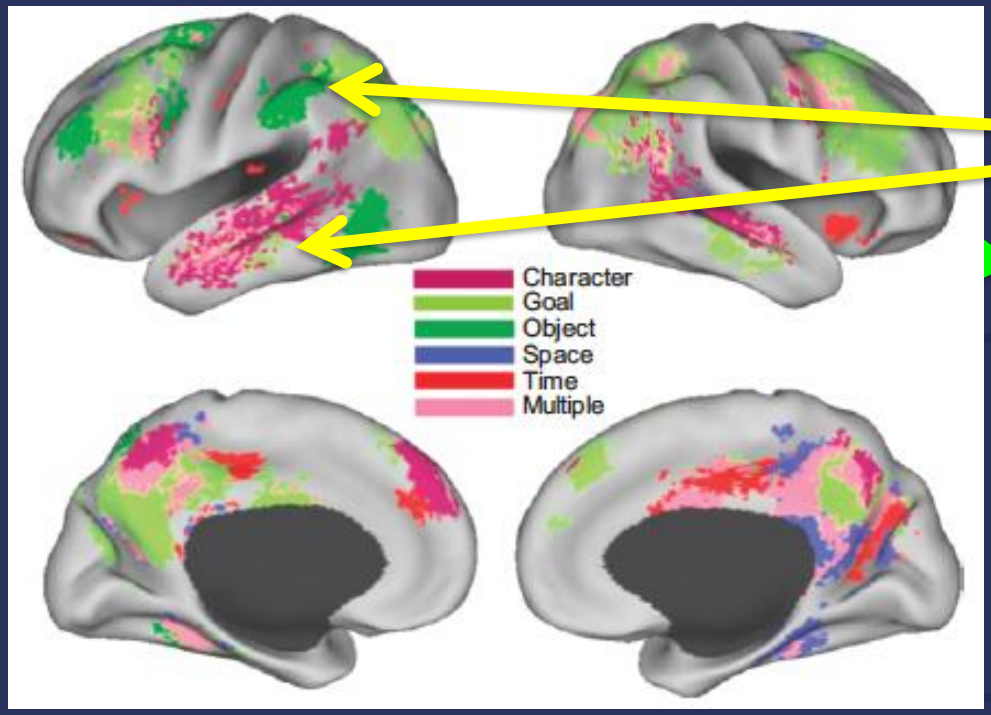
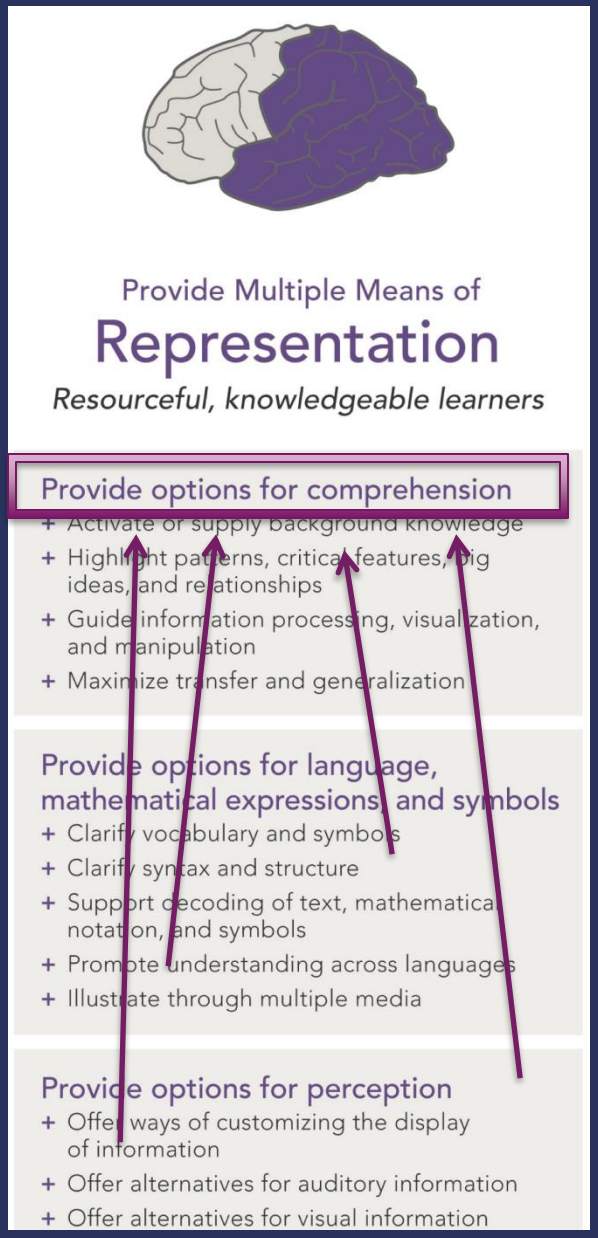
Alternatives for vocabulary knowledge

e.g. embedded vocabulary assists



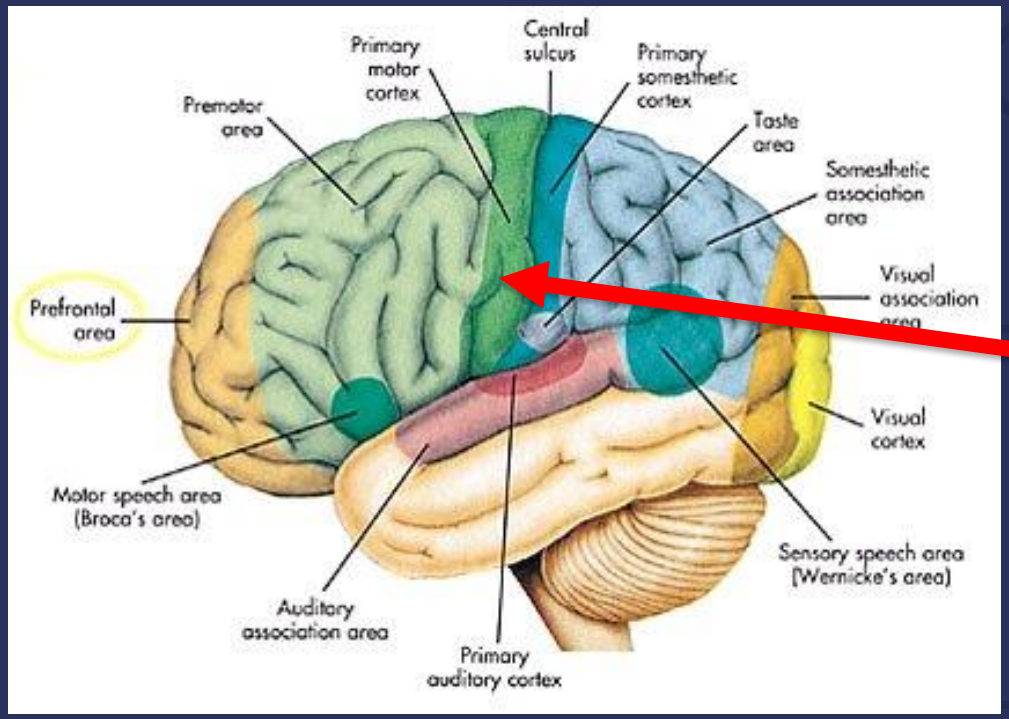
Alternatives for background knowledge



Fortunately,
in a UDL universe…….

Can have multiple paths
to Shakespeare,
All built in

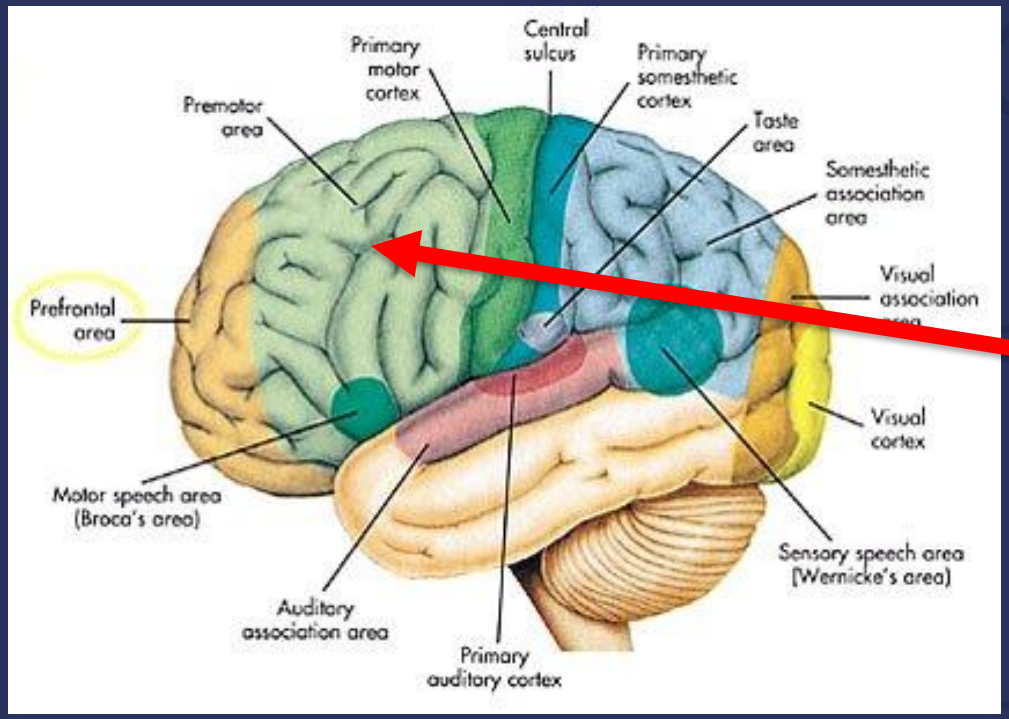
A few examples:
Reducing the Barriers and Increasing the Options to Deeper Learning



Physical Actions or Movement

Tod Machover and Dan Ellsey

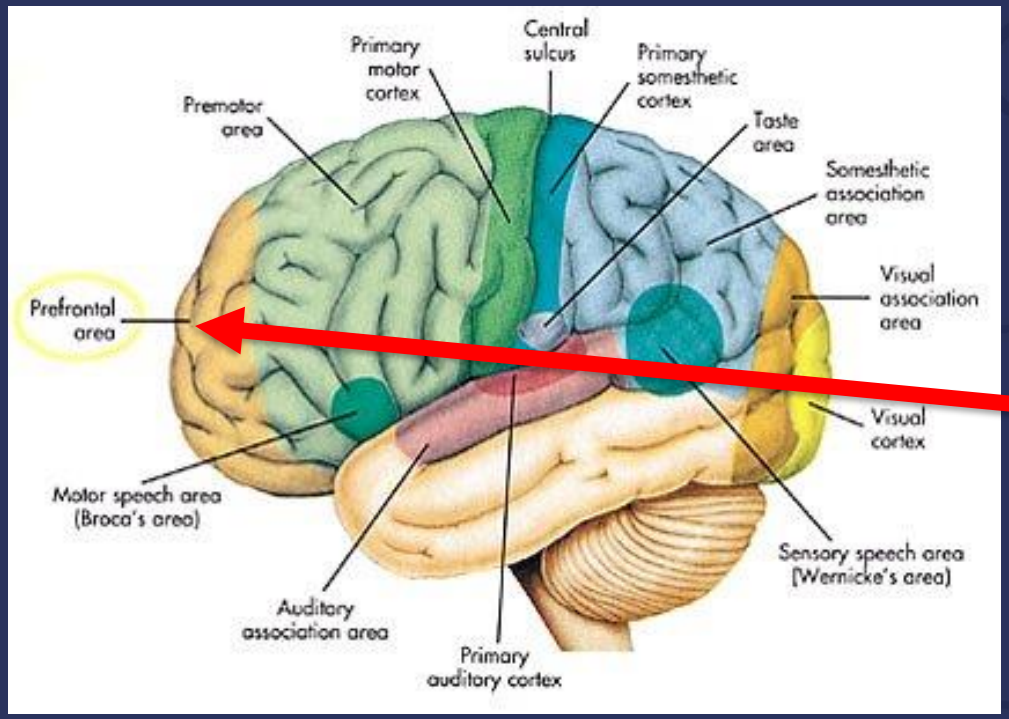
A few examples:
Reducing the Barriers and Increasing the Options to Deeper Learning



Skills and Fluency

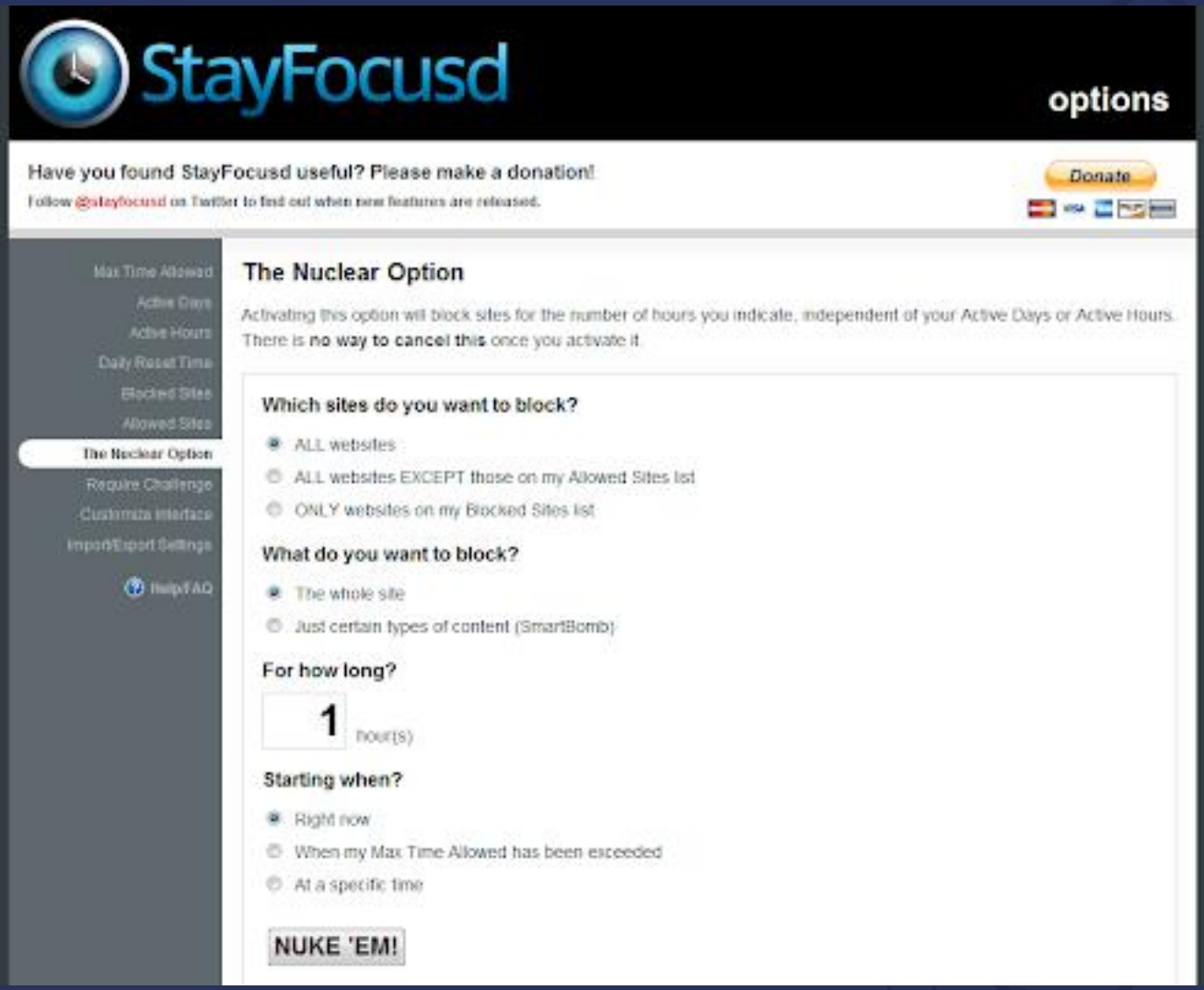
Alexa, Siri, Google Assistant, Cortana

Reducing the Barriers to Deeper Learning



Executive Functions

Tim Berners-Lee


StayFocusd
options
Have you found StayFocusd useful? Please make a donation!
Follow @stayfocusd on Twitter to find out when new features are released.
Donate
Max Time Allowed
Active Days
Active Hours
Daily Reset Time
Blocked Sites
Allowed Sites
The Nuclear Option
Require Challenge
Customize Interface
Import/Export Settings
Help/FAQ
The Nuclear Option
Activating this option will block sites for the number of hours you indicate, independent of your Active Days or Active Hours.
There is no way to cancel this once you activate it.
Which sites do you want to block?
ALL websites
ALL websites EXCEPT those on my Allowed Sites list
ONLY websites on my Blocked Sites list
What do you want to block?
The whole site
Just certain types of content (SmartBomb)
For how long?
1
hour(s)
Starting when?
Right now
When my Max Time Allowed has been exceeded
At a specific time
NUKE 'EM!

Personal perturbations in Neuroscience, Technology and Education

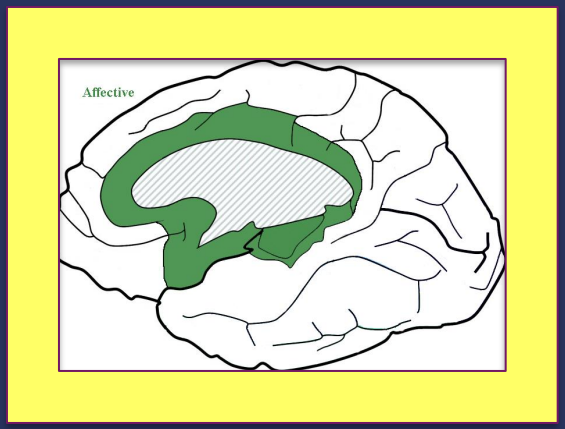
2000: Managing Cheeseburgers and Anxiety at GSE

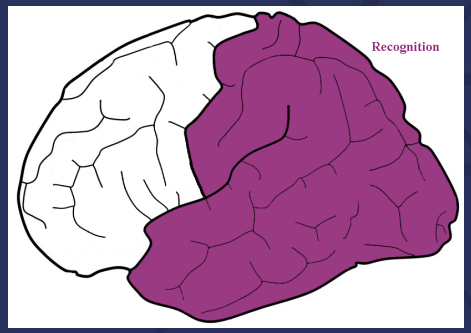
2008: Making Policy Matter in Washington

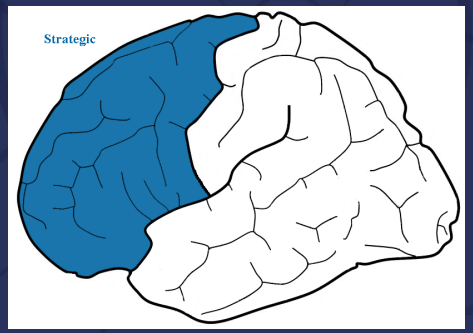
2019: Discovering that Neurology Bites Back: MCD

2019: Neurology Bites Back:

MCI and Other Regressions on the Spectrum

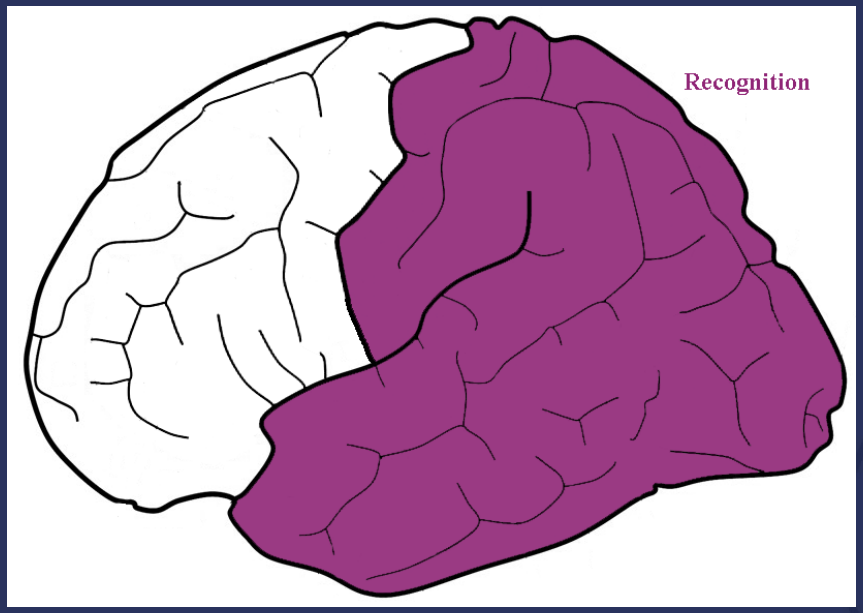


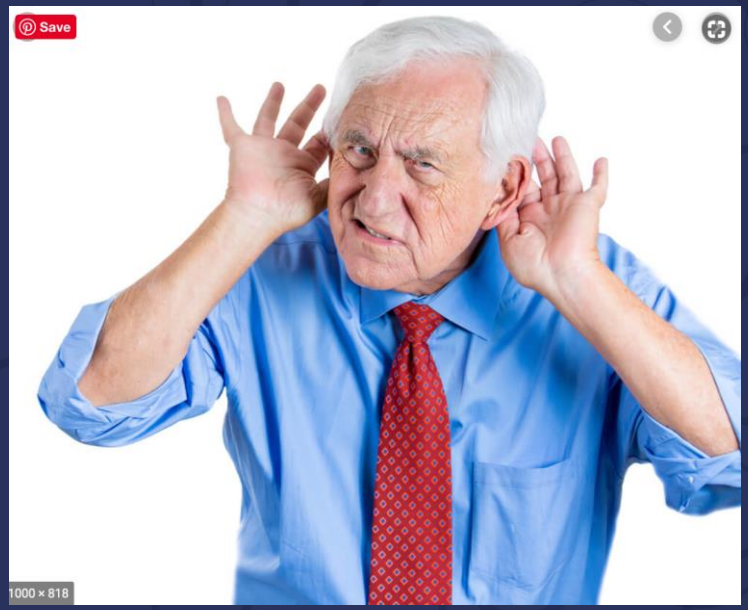




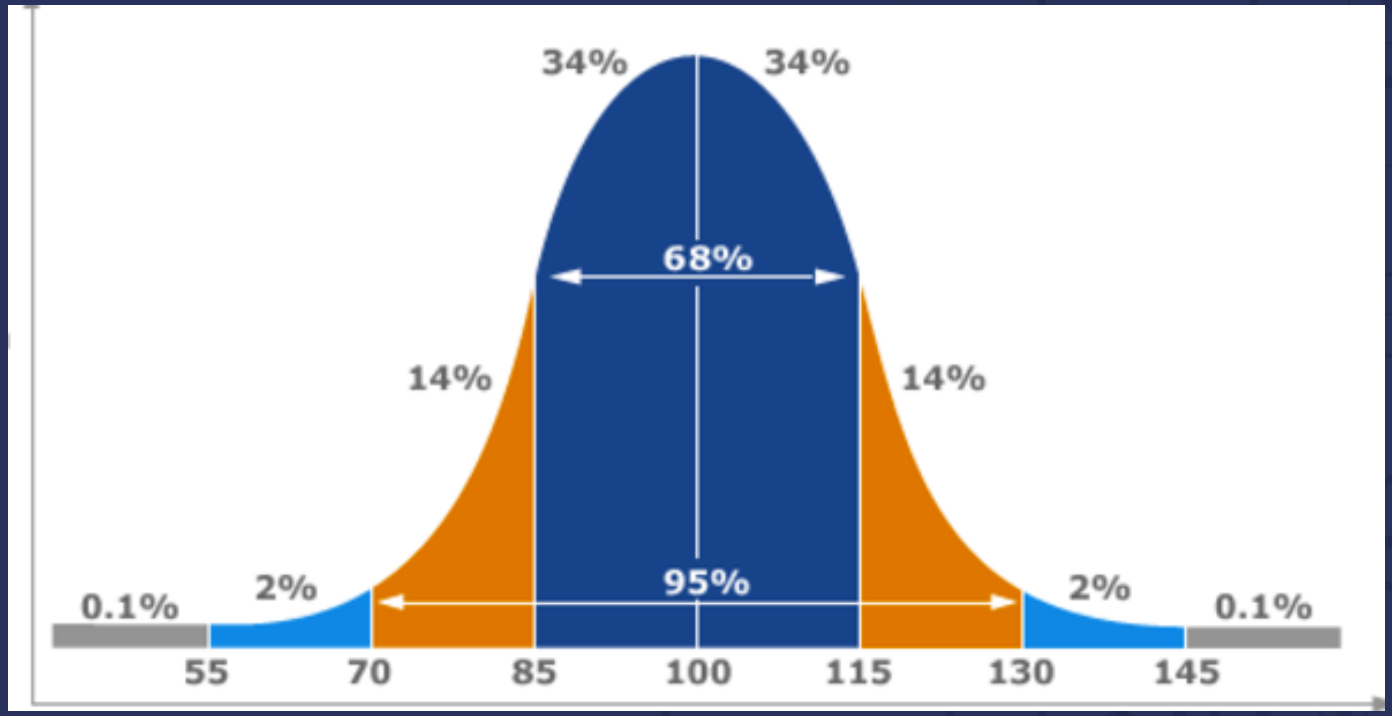
Aging on the Spectrum

New Barriers to Deeper Learning: 1) Recognition





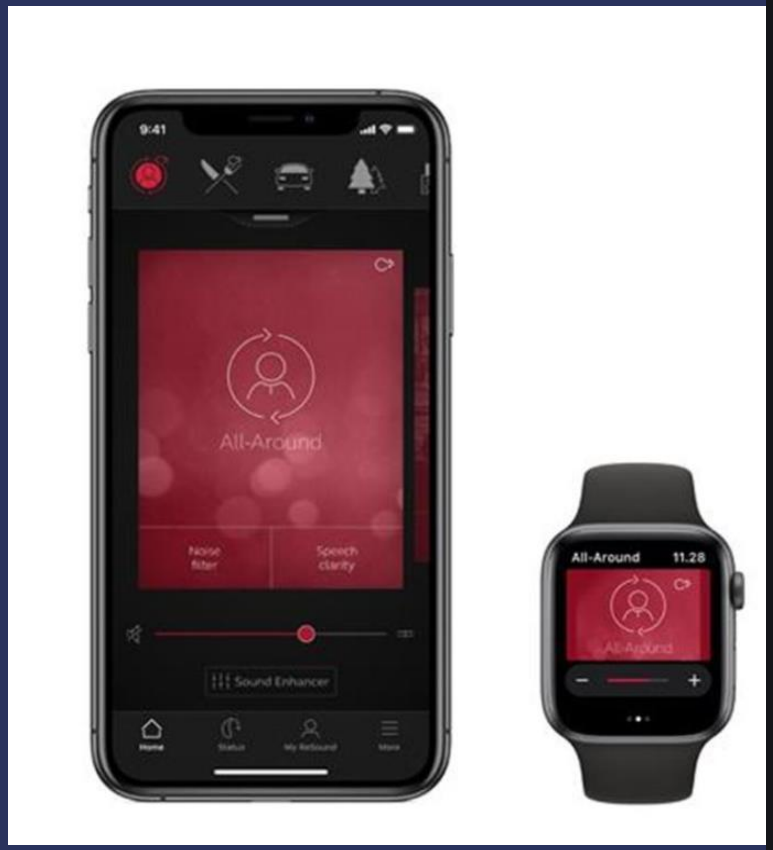
Where am I on the hearing spectrum?

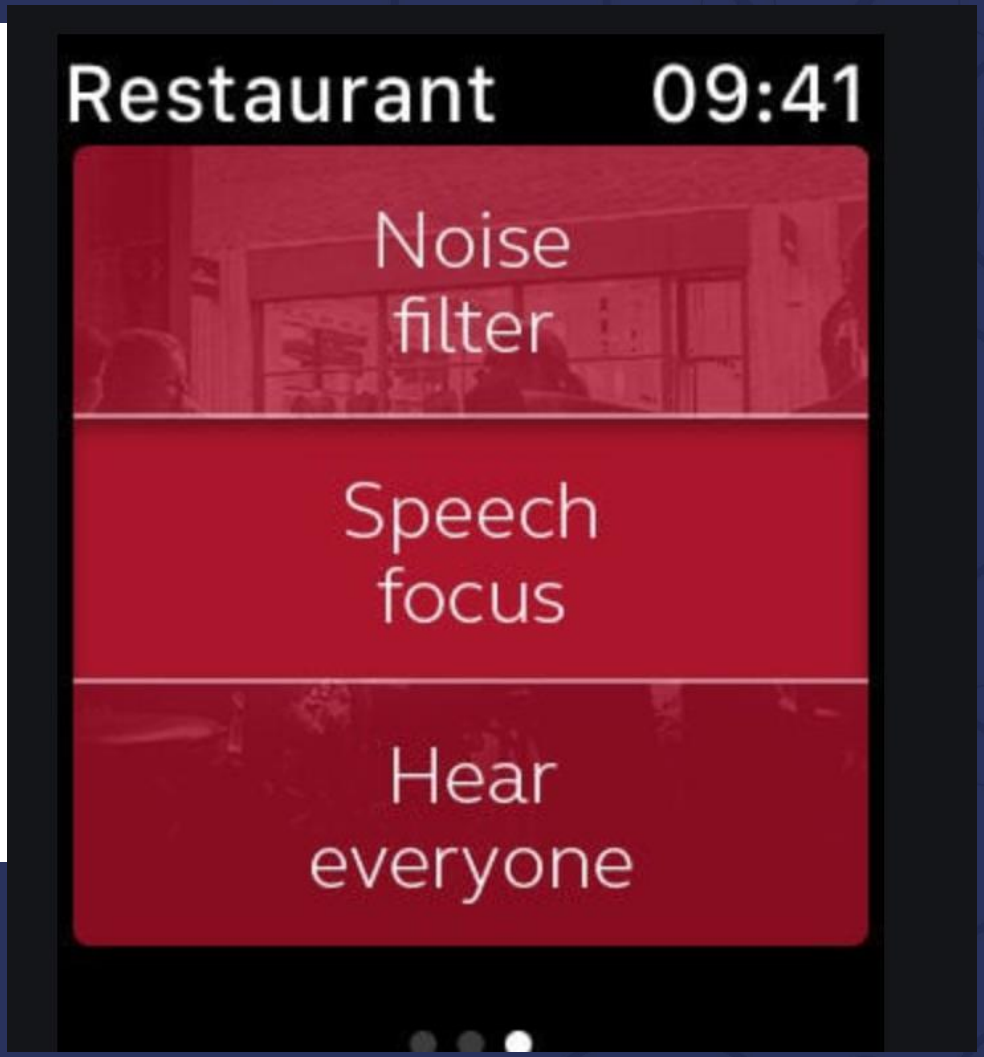


It depends……

New Technologies

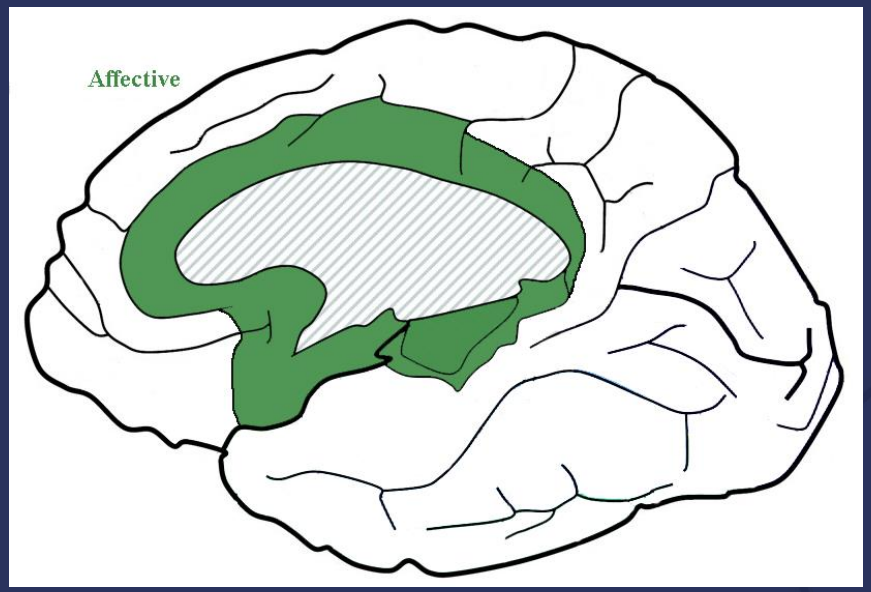
Reducing barriers to Deeper Learning



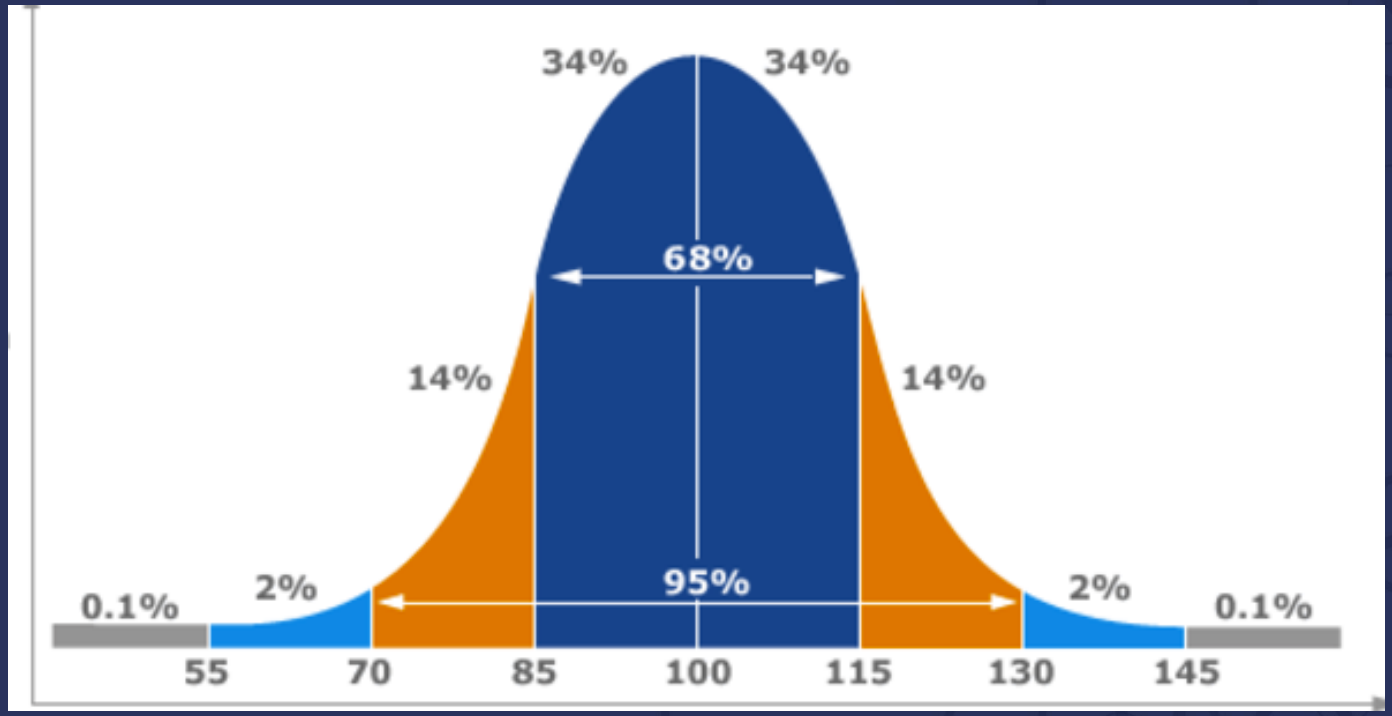


Aging on the Spectrum

New Barriers to Deeper Learning: 3) Affective

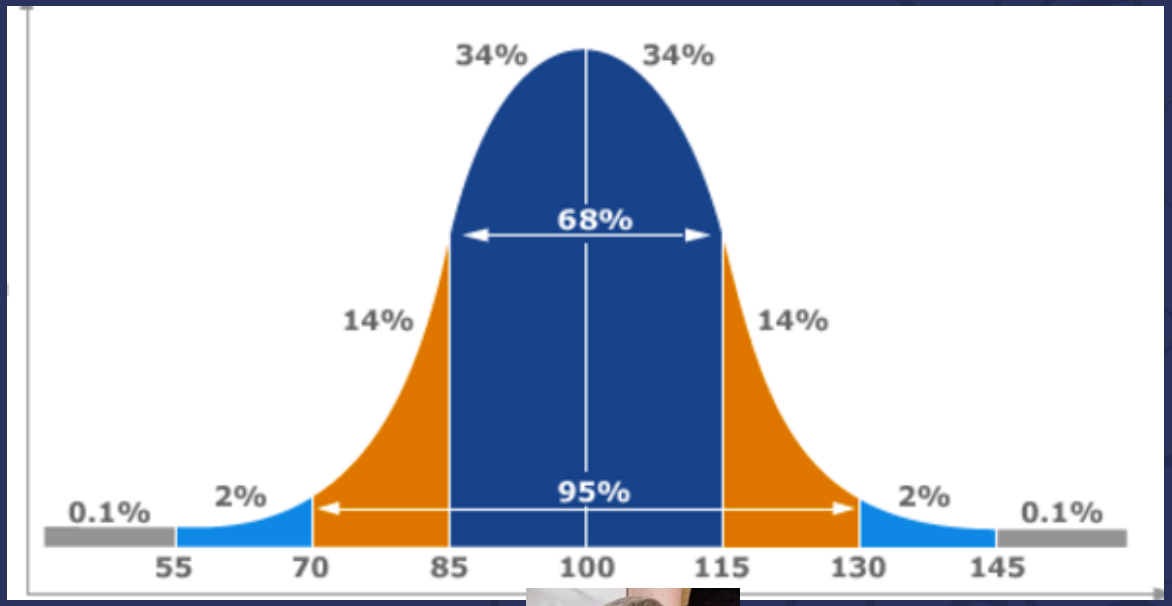


Where am I on the anxiety spectrum?



It depends……

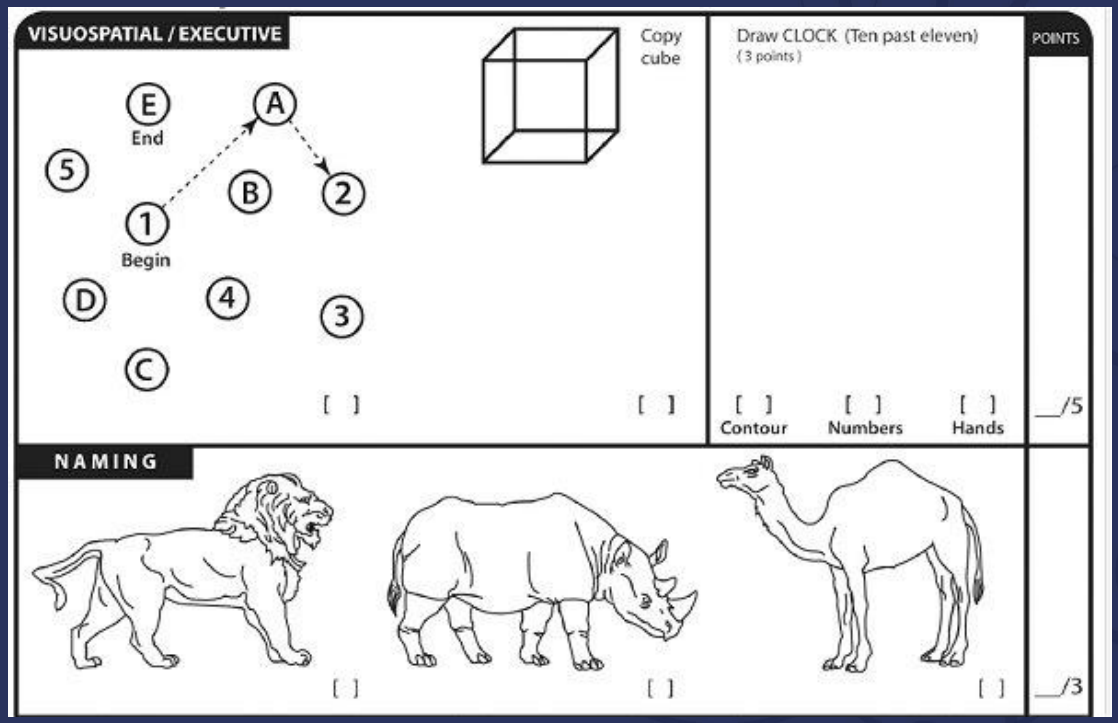
Where am I headed on the spectrum?



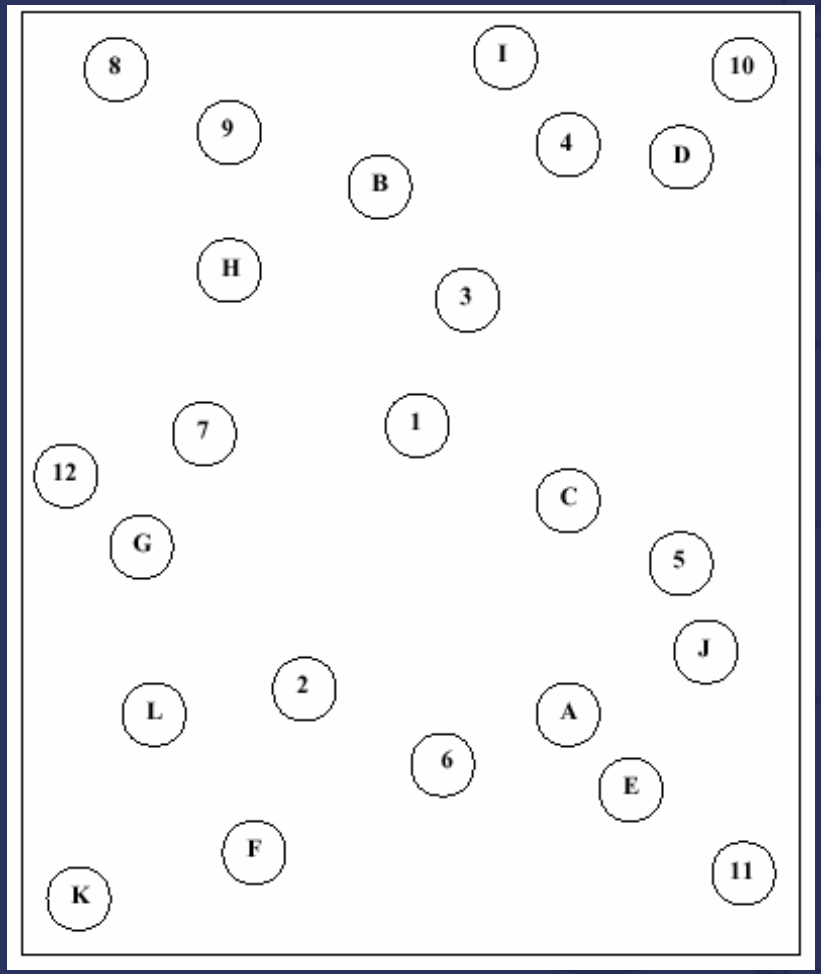
Hypo Anxious/Fearless

Hyper Anxious/Phobic

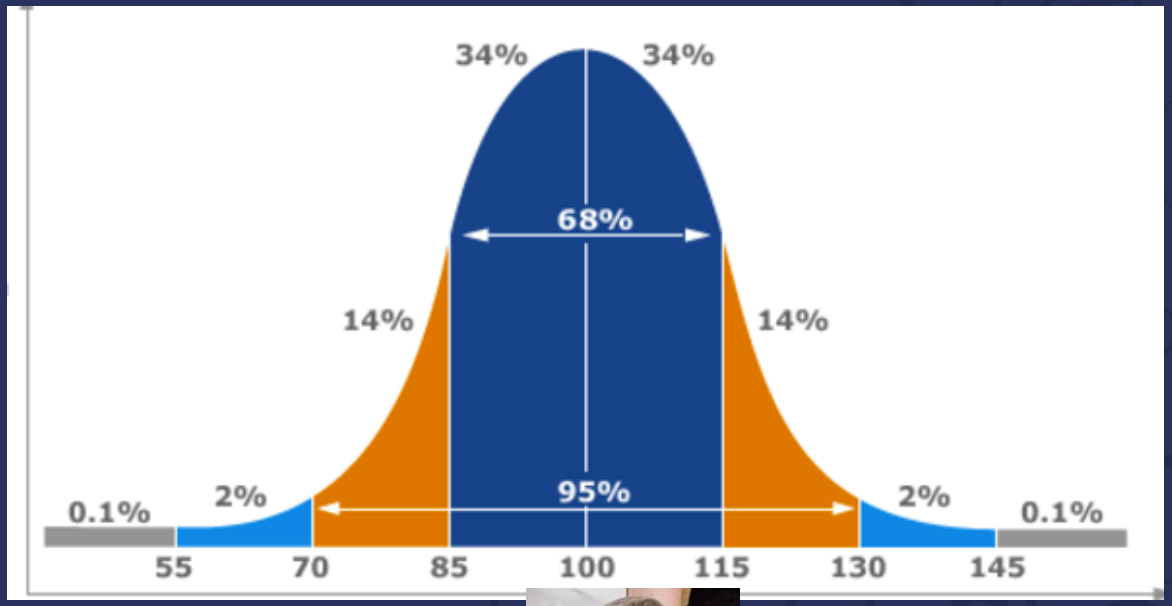
The MOCA Revisited



Trail Making Test Part B



Where am I headed on test anxiety?



Hypo Anxious/Fearless

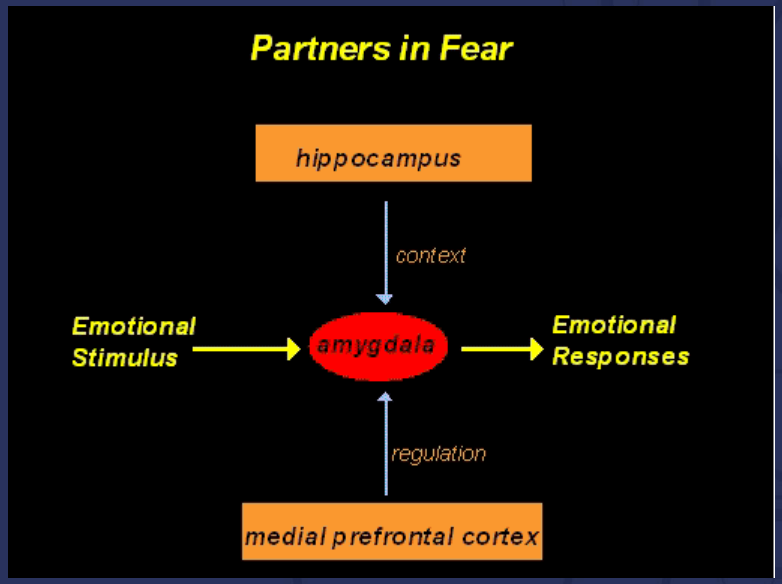
Hyper Anxious/Phobic

Dorenkamp, M. A., & Vik, P. (2018). Neuropsychological assessment anxiety: A systematic review. *Practice Innovations, 3*(3), 192–211.

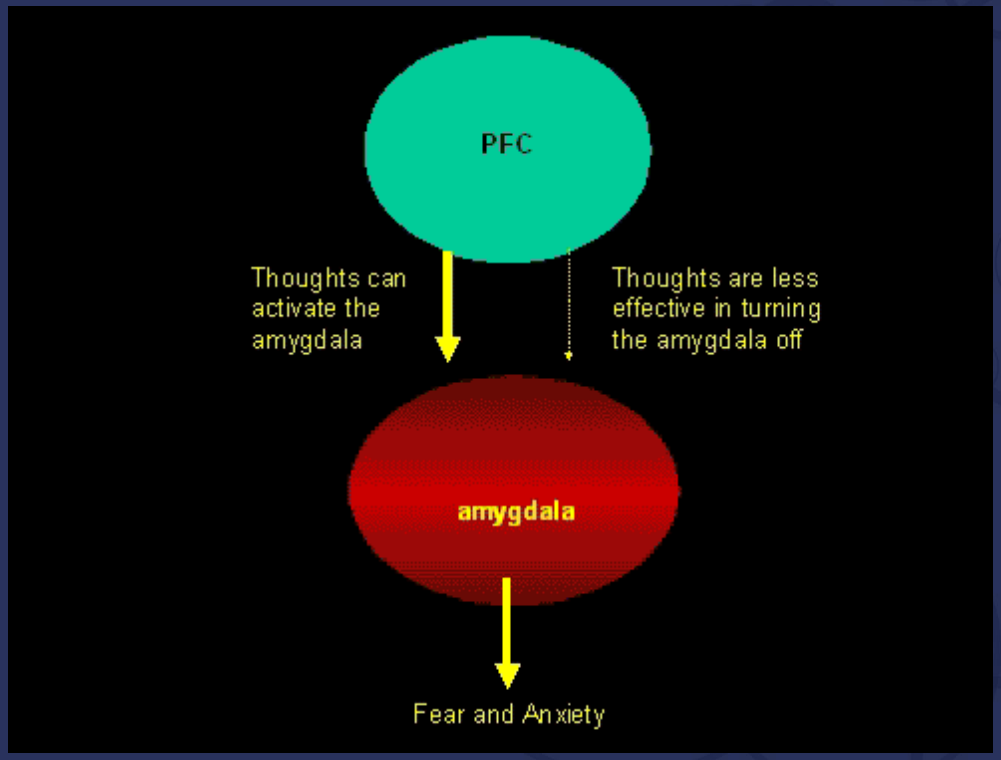
Abstract

Older adults are the fastest growing population seeking cognitive assessment services, primarily regarding cognitive concerns and capacity to live independently. Neuropsychological assessment can evoke stress/anxiety in patients, and anxiety has been implicated in poor test performance. A review of the literature failed to identify empirical articles dedicated to the impact of a patient's awareness of the purpose and potential implications of a neuropsychological evaluation on test performance. This article systematically reviewed literature regarding anxiety/stress to understand what anxiety domains threaten performance, and identify vulnerable cognitive abilities. Seventy-eight articles were reviewed. Sixty anxiety/stress measures were used and were classified into 7 domains: global, trait, state, social, test, and math anxiety, and stress. There were 149 neuropsychological tests that were used and classified into 13 domains: academic achievement, attention, executive functioning (inhibition/switching and reasoning/fluency), full scale intelligence, language, memory (overall, verbal, and visual), mental status exams, motor, perception, processing speed, verbal comprehension, and working memory. Results revealed that (a) most studies examined healthy adult populations, (b) few studies used clinical samples, and (c) no studies focused on older adults from clinical populations. Of the studies reviewed, nearly 2/3 reported some relationship between test performance and anxiety. Test, social, state, and math anxiety were most often associated with poor test performance. Verbal memory, attention, inhibition, and working memory were most consistently associated with anxiety. Findings highlight the importance of attending to anxiety in older adults referred for neuropsychological evaluation and the need for anxiety assessment measures that are sensitive to aging patients' concerns.

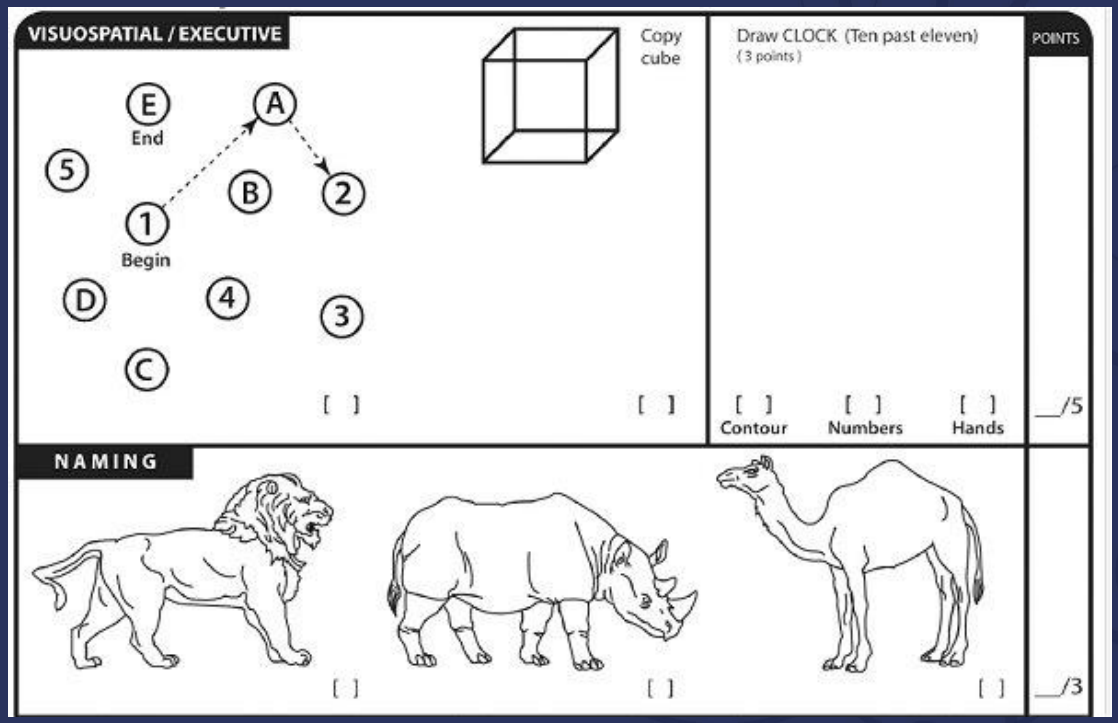
Affect as Heterarchical



Affective Networks



The MOCA: A test of anxietyg

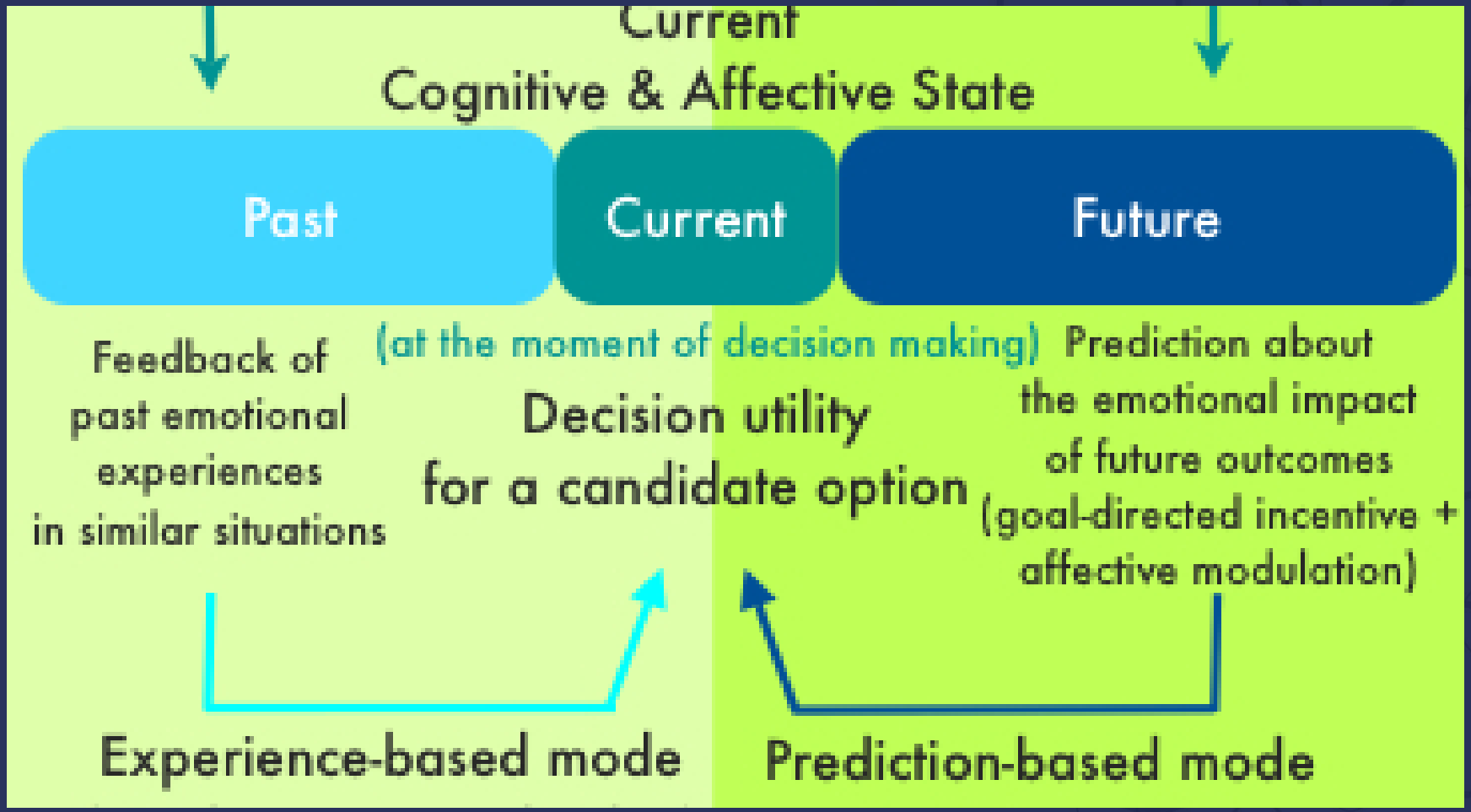


Reasoning about social conflicts improves into old age

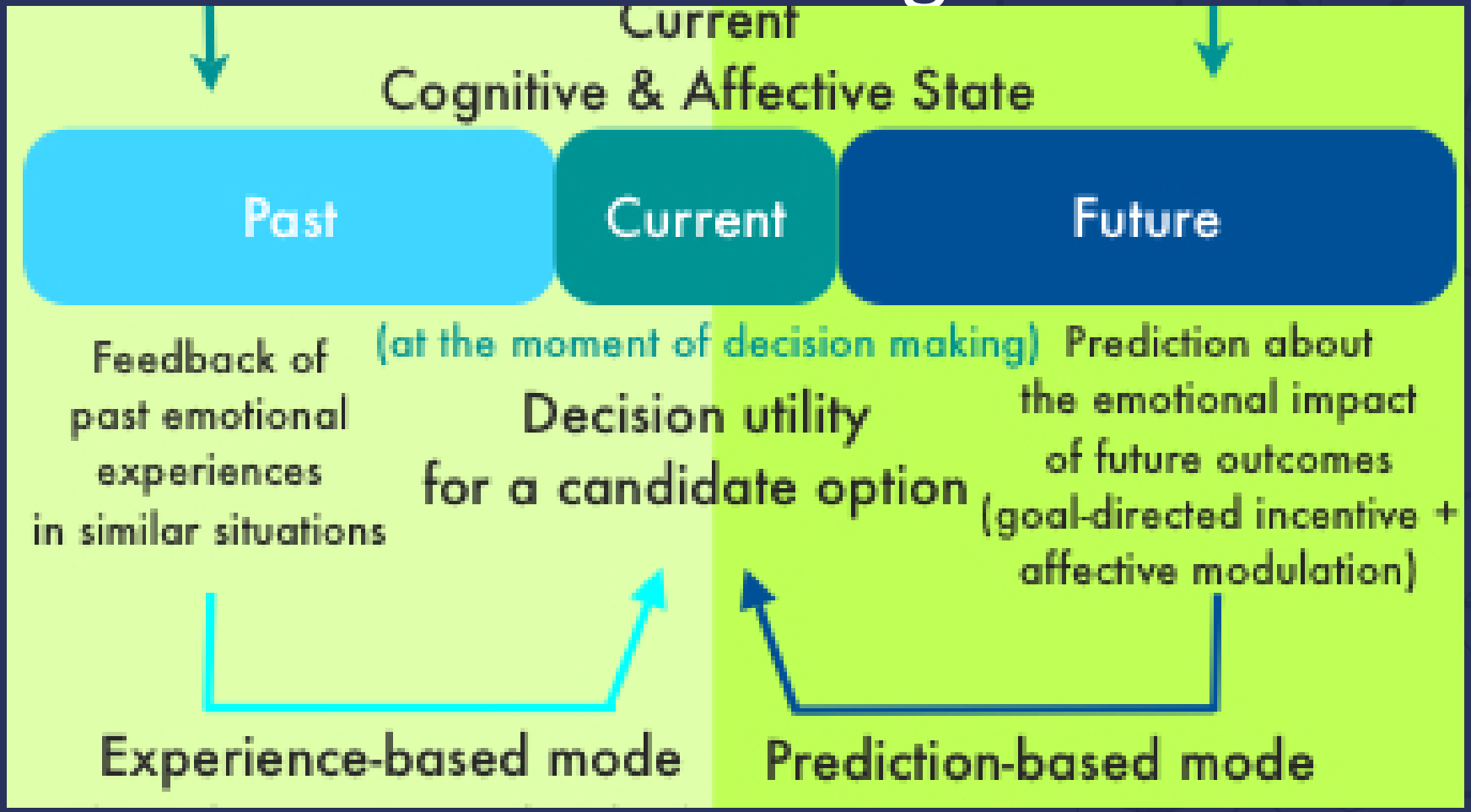
Igor Grossmann[a,1], Jinkyung Na[a], Michael E. W. Varnum[a], Denise C. Park[b], Shinobu Kitayama[a], and Richard E. Nisbett[a,1]

[a]Department of Psychology, University of Michigan, Ann Arbor, MI 48109; and [b]Center for Vital Longevity, University of Texas at Dallas, Dallas, TX 75235

Recovering the



Revisioning the future



- **MMSE vs. MoCA: What You Should Know**
- By Lindsey Getz
- Today's Geriatric Medicine, Feb 2020

The ceiling for MMSE is that a highly educated person may score well on the MMSE but not be able to recognize their grandchildren,"

- Brain activity during dual task gait and balance in aging and age-related neurodegenerative conditions: A systematic review
- Author links open overlay panelMelikeKahya[a]SangheeMoon[a]MaudRanchet[b]Rachel R.Vukas[c]Kelly E.Lyons[d]RajeshPahwa[d]AbiodunAkinwuntan[ae]HannesDevos[a]

perimental Gerontology
lume 129, December 2019, 110756

iew

rain activity during dual task gait and balance in aging and age-related neurodegenerative conditions: A systematic revi

thor links open overlay panel VelikeKahya-SangheetMoon-MaudRanchet-Rachel R.Vukas-Kelly E.Lyons-RajeshPahwa-AbiodunAkinwuntan-HannesDevos

ps://doi.org/10.1016/j.exger.2019.110756Get rights and content

ighlights

der adults and people with age-related neurodegenerative conditions had increased brain activity during dual task gait and balance

ith aging and/or neurodegeneration people are less efficient to perform dual task, therefore, recruit alternative neural resources

is currently unclear which EEG metrics are most sensitive in detecting brain activity during dual task gait and balance

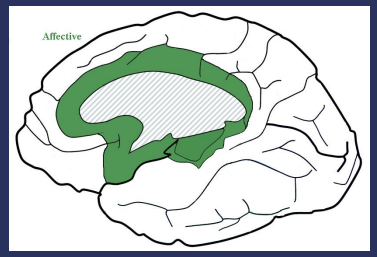
is important to understand the relationship between brain activity during dual task gait and balance and behavioral outcomes

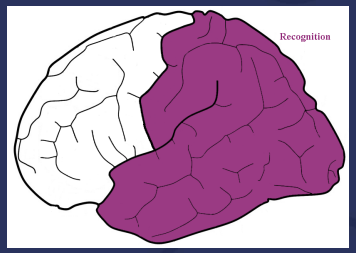
nderstanding that relationship might help to better optimize the rehabilitation interventions

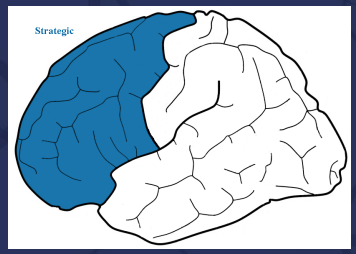
bstract

e aims of this systematic review were to investigate (1) real-time brain activity during DT gait and balance, (2) whether changes in brain activity correlate with changes in behavioral o
e rehabilitation interventions.

Review: The Three Main Divisions of Neocortex







The Goal of UDL-inspired Education: Expert Learners

The ultimate purpose of UDL is not simply to help learners master a specific body of knowledge,

but to master learning itself.

Through UDL, we are seeking to create

Expert Learners

Learners who - whatever their particular strengths and weaknesses –

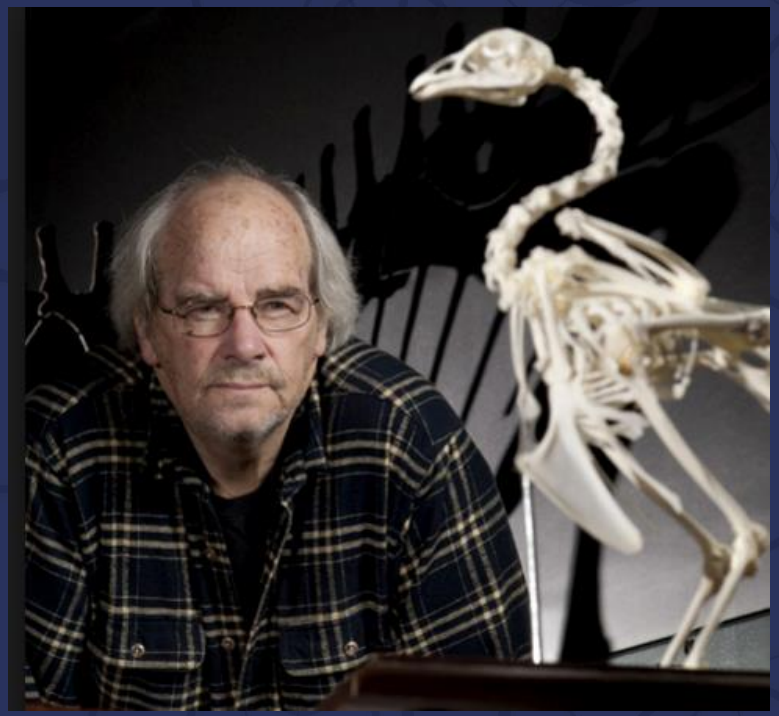
Know *how to learn DEEPLY.*

What experts look like.

Resourceful & knowledgeable	Strategic & goal-directed	Purposeful & motivated
• Bring considerable prior knowledge to new learning • Activate that prior knowledge to identify, organize, prioritize, and assimilate new information • Recognize the tools and resources that would help them find, structure, and remember new information • Know how to transform new information into meaningful and useable knowledge	• Formulate plans for learning • Devise effective strategies and tactics to optimize learning • Organize resources and tools to facilitate learning • Monitor their progress • Recognize their own strengths and weaknesses as learners • Abandon plans and strategies that are ineffective	• Are eager for new learning and are motivated by the mastery of learning itself • Are goal-directed in their learning • Know how to set challenging learning goals for themselves • Know how to sustain the effort and resilience that reaching those goals will require • Monitor and regulate emotional reactions that would be impediments or distractions to their

More Scientists

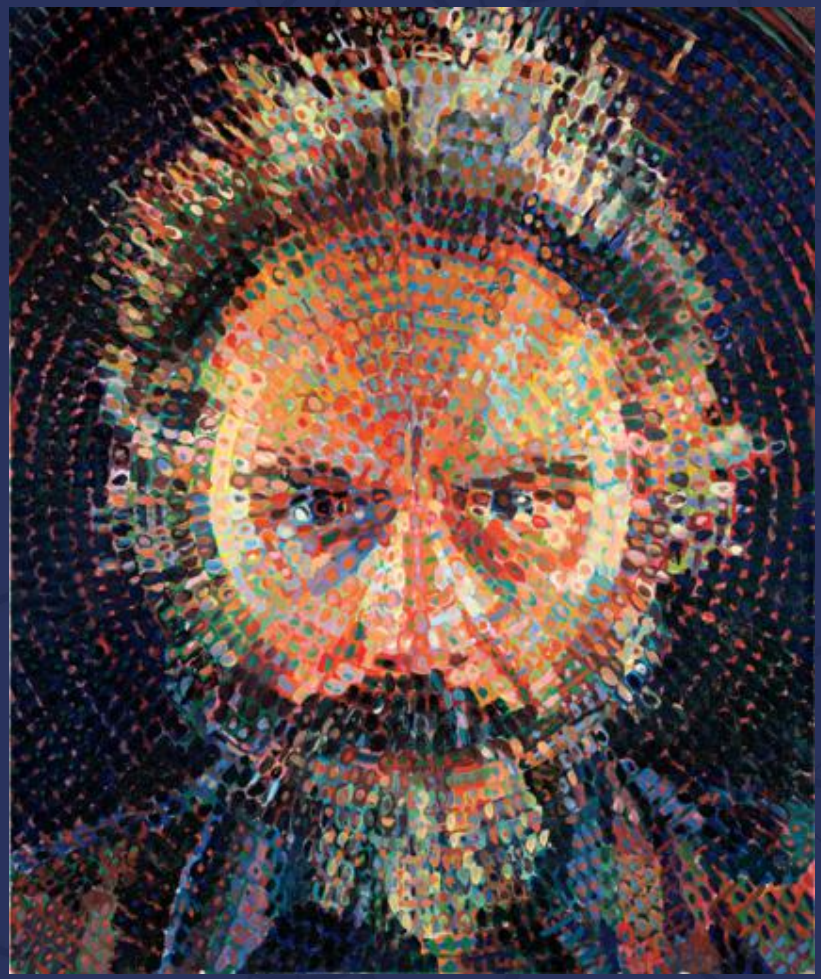
Stephen Hawking
Physicist



Jack Horner
Paleontologist

More Artists

Stephen Wilshire



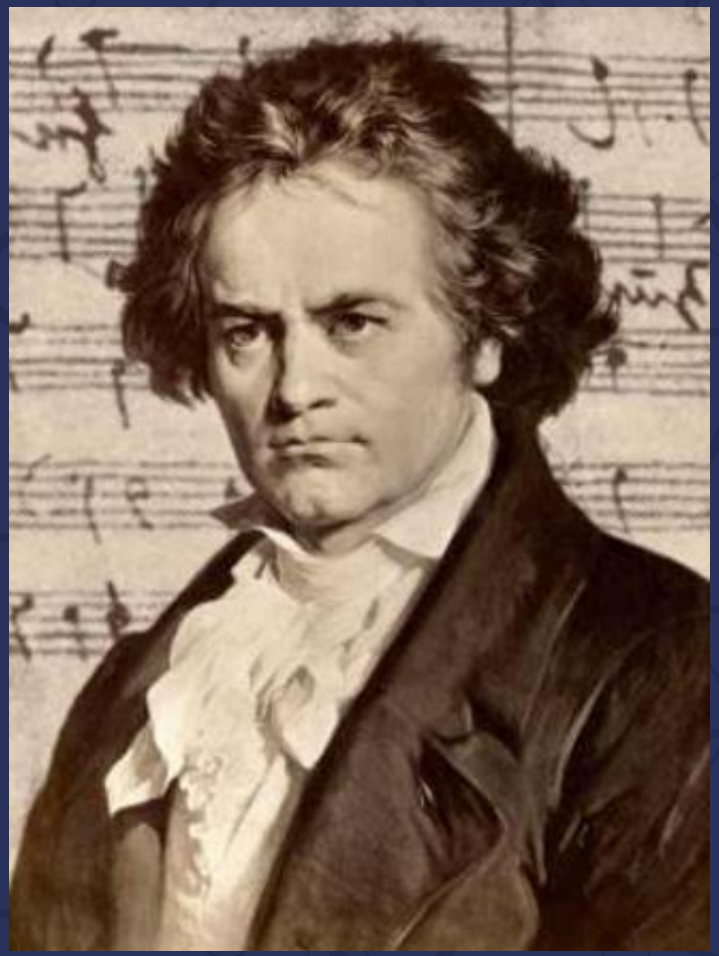
Chuck Close

More Storytellers

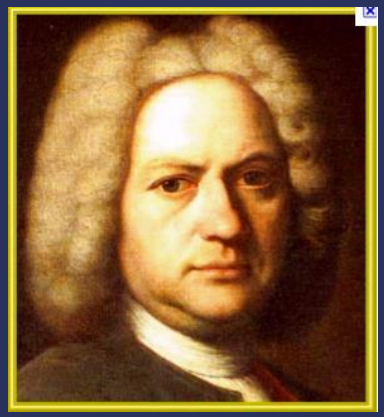
George Lucas Harrison Ford Stephen Spielberg

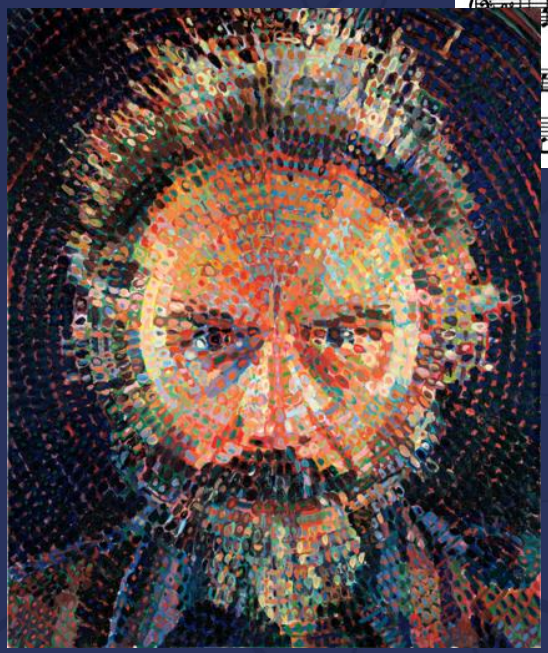
More musicians

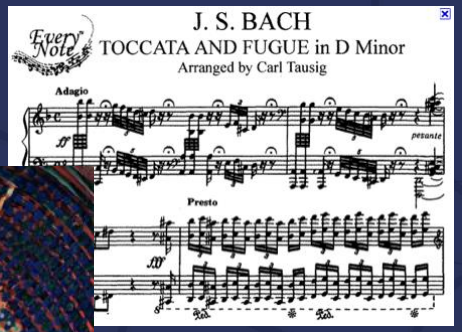
Dame Evelyn Glennie



Ludwig Van Beethoven







To make an education
that is more universal
more "musical"
for everyone.