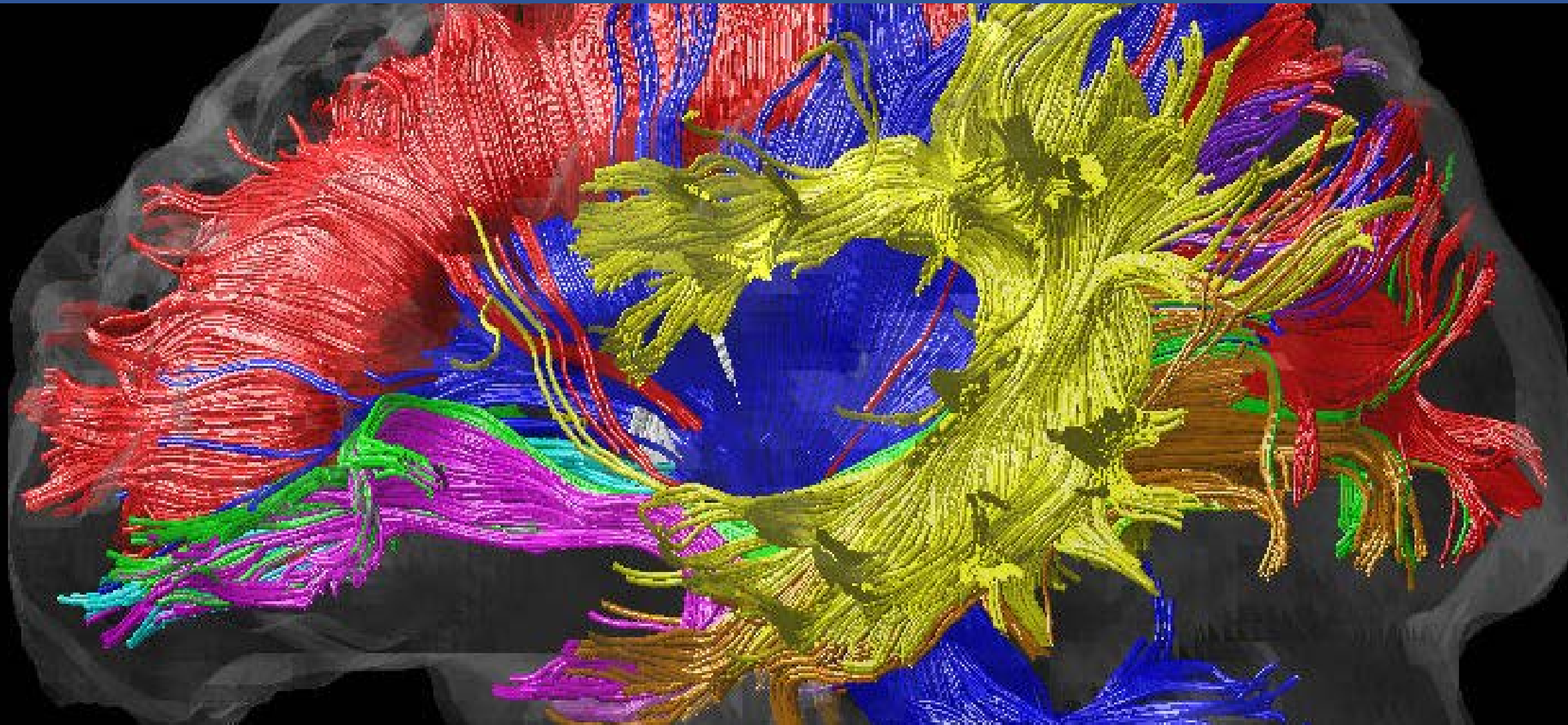


Deep Reading in the Digital World

Maryanne Wolf, UCLA
Bibliion: Library Collections of the Future





THE MISSION

Literacy is a basic human right.

Across all learners,
all ages, all
backgrounds.

Literacy as the 'Canary in the Mind'

- Literacy changes the brain, which changes the individual, which changes society, which changes the future of the species.

As literacy changes, so does the individual, the society, the species.

漢字 汉字

na	a	sa	su	gal	zi	mu	ma
bi	an, dingir	kám	im	ú	ši	bad	ri
ir	ra	ud	dím	ni	aš	hal	mug
zu	su	šun	ka	ba	la	ád	gu, kú
bal	zadmin	búi	tar	iti	aššur	arad	ush



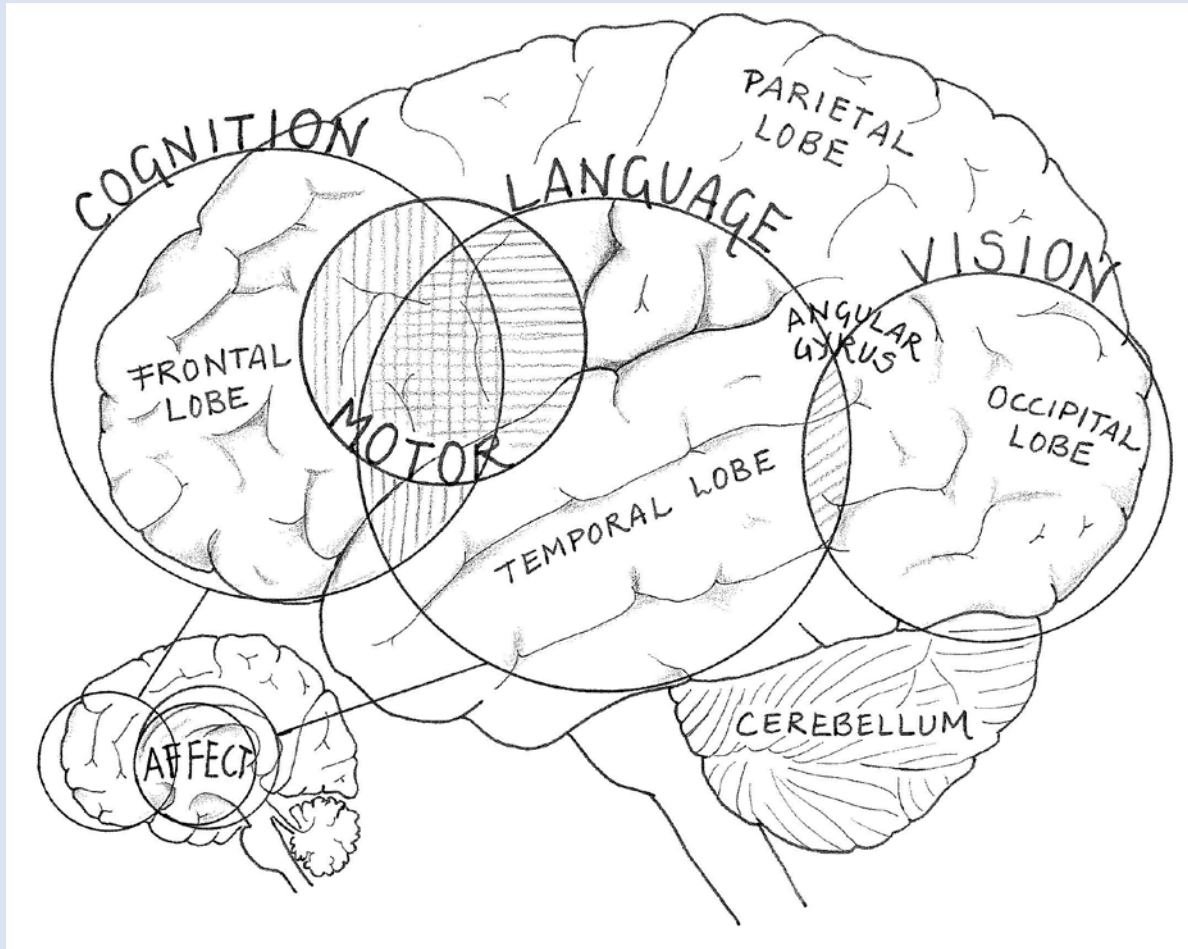
Walter Ong and our Technologies

“Technologies are not mere exterior aids, but also interior transformations of consciousness, and never more than when they affect the word.”

from *Orality and Literacy:*

The Technologizing of the Word

The Unnatural Development of the Reading Brain

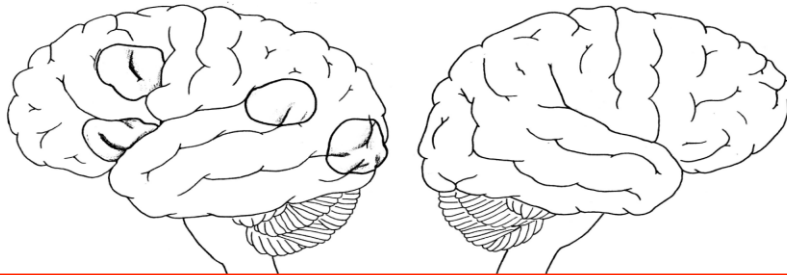


The human brain was never born to read.

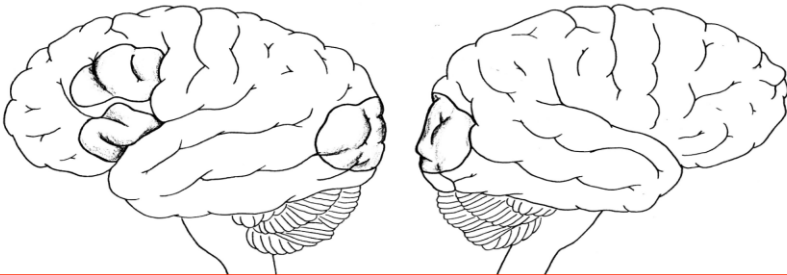
Each reader creates a new, *plastic* reading circuit from older cognitive and linguistic structures.

PLASTICITY: Multiple Circuits Possible

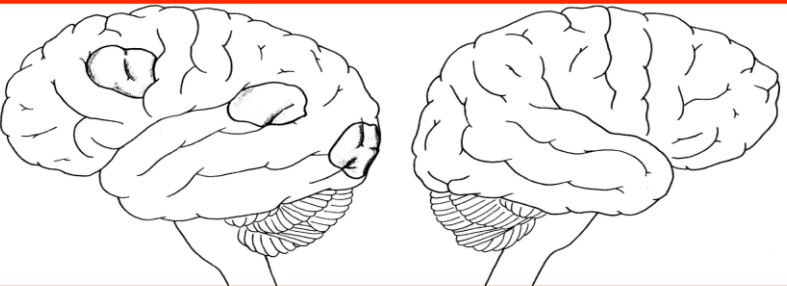
English



Chinese &
Kanji



Japanese
Kana



Brain can rearrange itself in multiple ways to read, depending on **writing system** and **medium**.

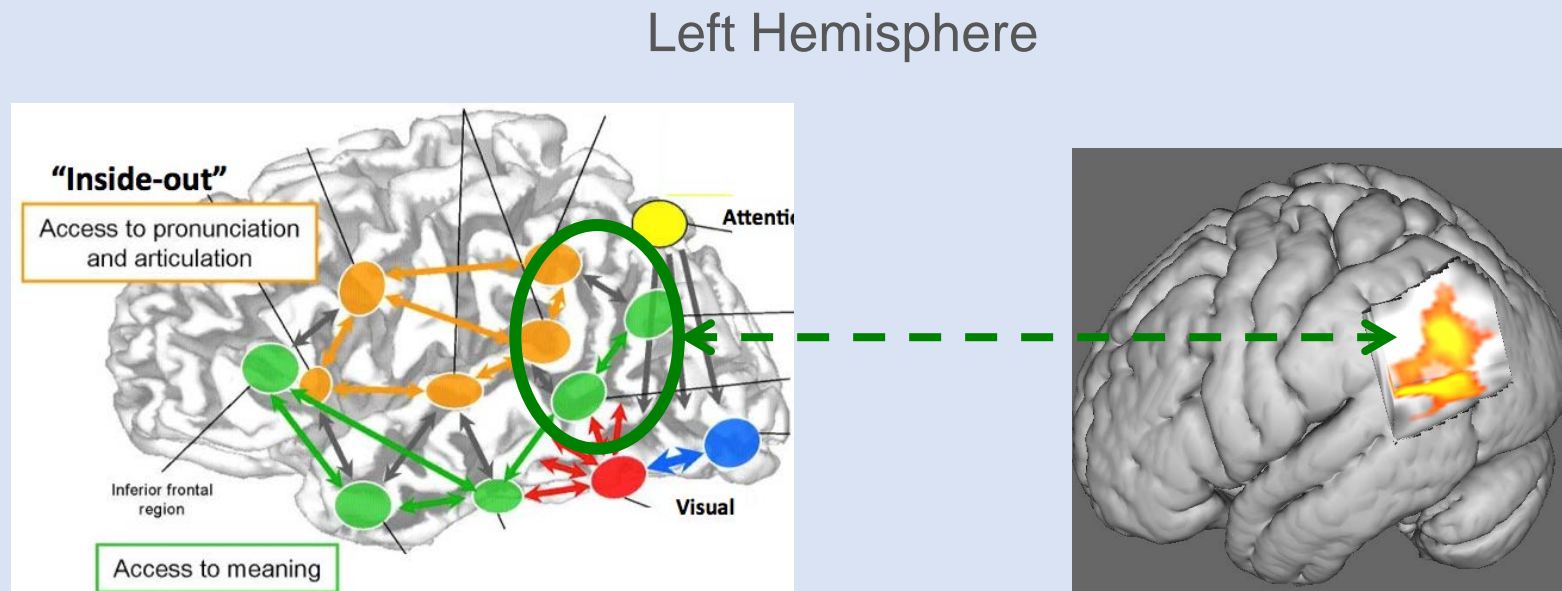
Developing the Components of the Reading Brain: Language



Phonemes
Orthography
Semantics
Syntax
Morphology

Effects of Parents Reading “Under the crook of an arm”

John Hutton et al, Cincinnati Hospital for Children



- **Semantic Processing**
(Understanding)
- **Visual Imagery**
- **Controlled for household income**

Developing Cognitive Development and Background Knowledge

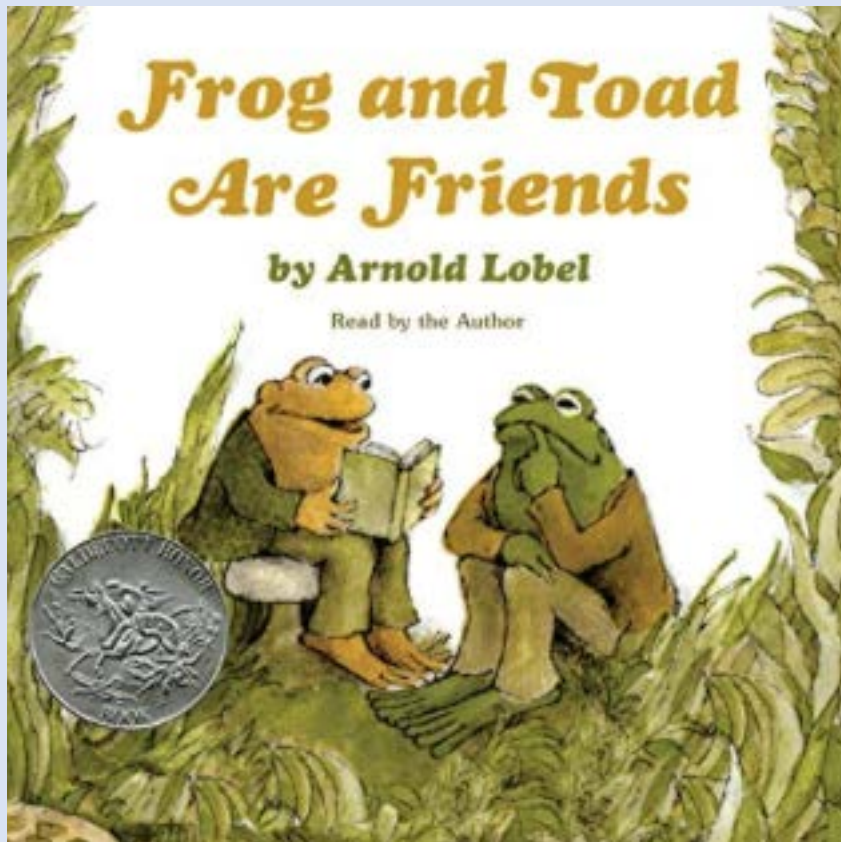


“The rich get richer
and the poor poorer.”

...Matthew 4:23

(Stanovich for vocabulary)

Developing Emotional and Social Development: The Origins of Empathy



Every story introduces the child to a new piece of information about how others think and feel, and a chance to try this on for themselves without fear.

Stories as the Birthplace of “Compassionate Imagination” (Martha Nussbaum)



An evolving understanding of “others” is the foundation for a future on an increasingly connected planet.

The Heart of Expert Deep Reading

At the heart of reading,
100 to 200 milliseconds
allows us

“to leave the wisdom of
the author to discover
our own...”



Deep Reading

Background Knowledge

Perspective Taking/Empathy

Critical Analysis

Novel Thought

Inference,
Deduction/Induction,
Analogical Thinking

Imagery

Insight & Reflection



Going beyond the
wisdom of the
author.

Fiction Increases Empathy (Oatley and Mar)

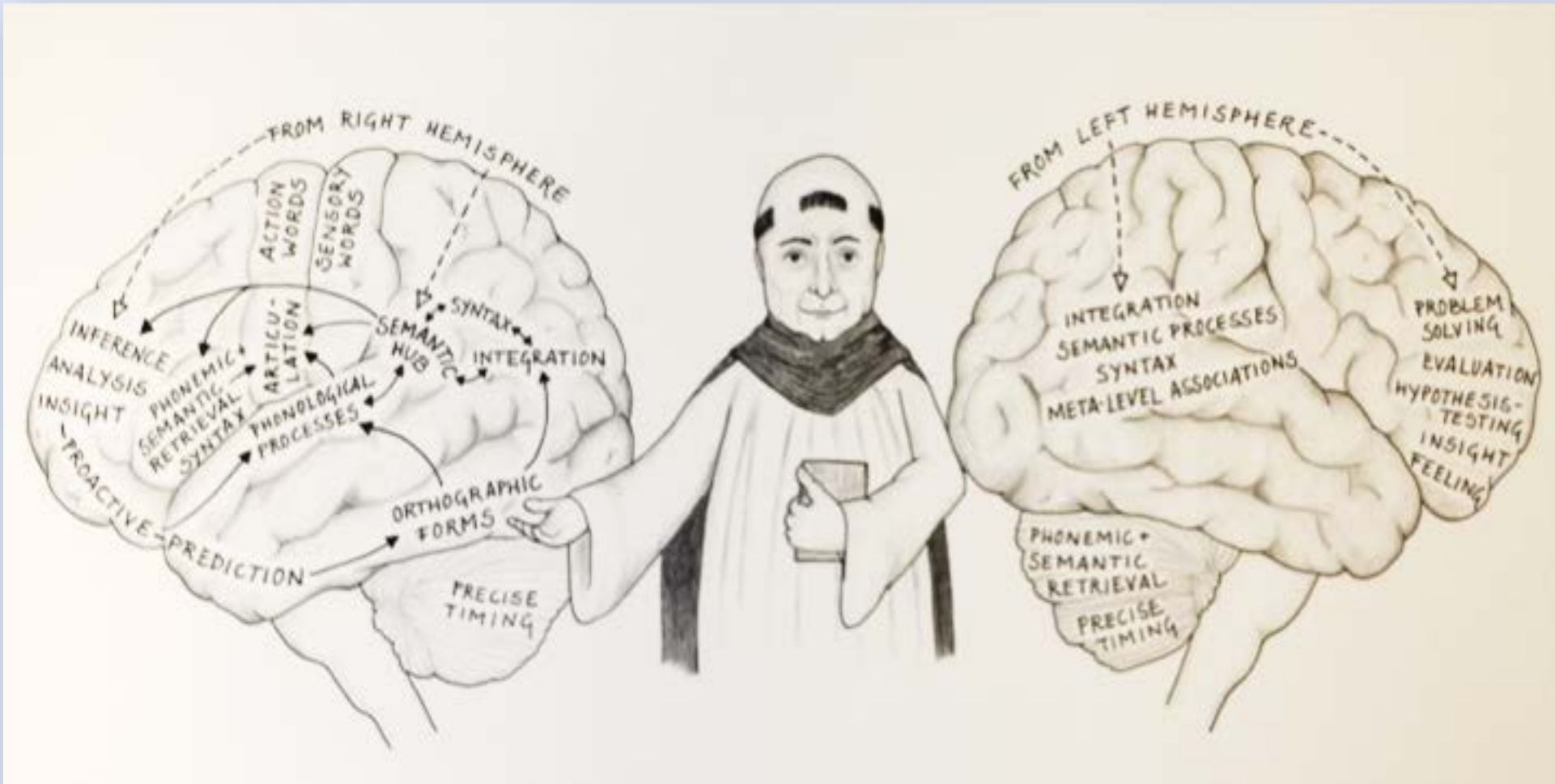


“What’s a piece of fiction, what’s a novel, what’s a short story...? It’s a piece of consciousness being passed from mind to mind..

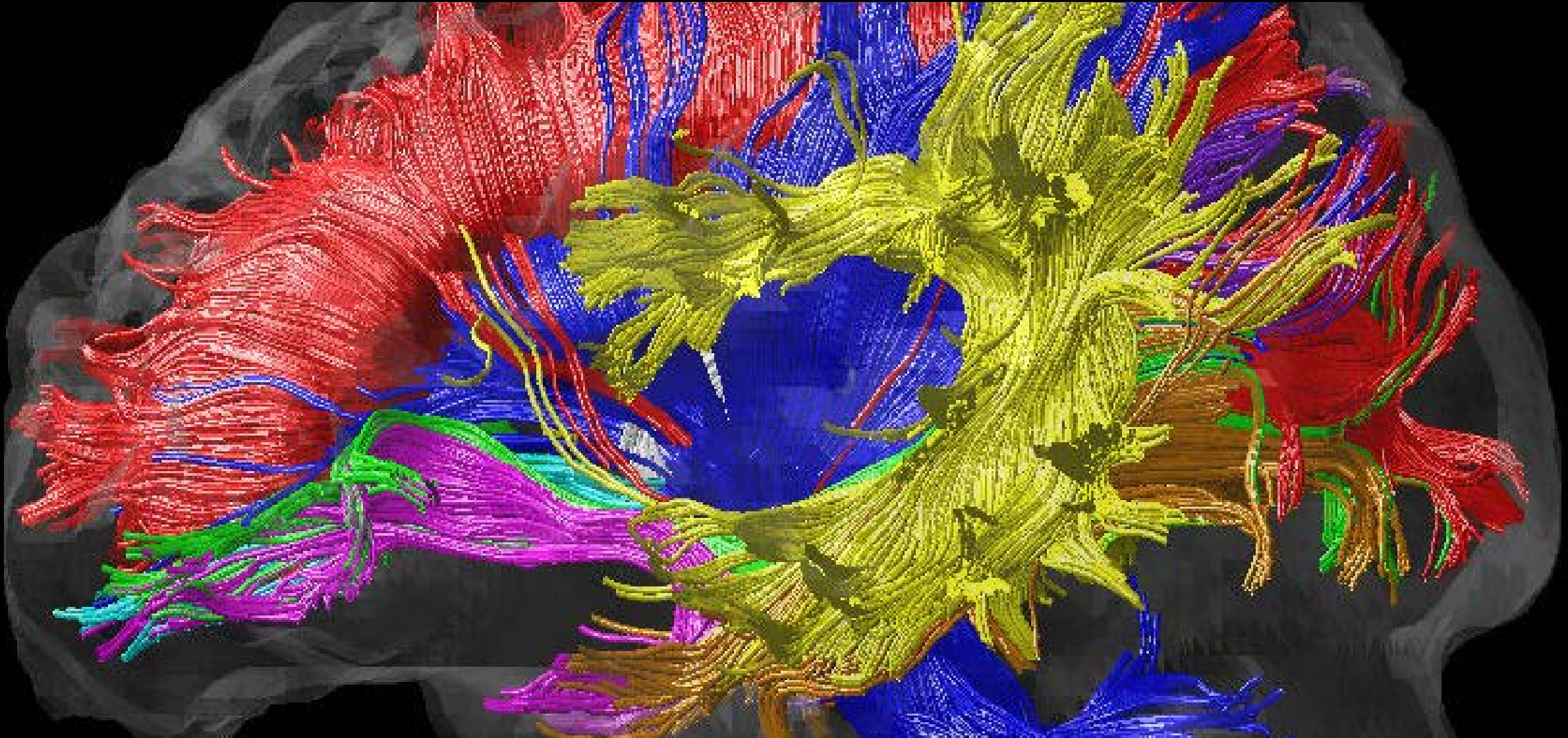
(Oatley, 2018)

”

Deep Reading Brain Circuit & St. Thomas Aquinas




Understanding the Deep Reading Brain Circuit in a Digital World





No Binaries

- Past vs. Future
- Traditional vs. Innovative
- Print vs. Digital



“We transgress not because we try to build the new, but because we do not allow ourselves to consider what it disrupts or diminishes.”

- Sherry Turkle, *Alone Together*

The Reading Circuit Reflects the Medium



“Every medium has its costs and weaknesses; every medium develops some cognitive skills at the expense of others...the cost seems to be to deep processing: critical thinking, imagination and reflection.”

-Patricia Greenfield, 2009

Evidence from Infancy to Five: Early Language



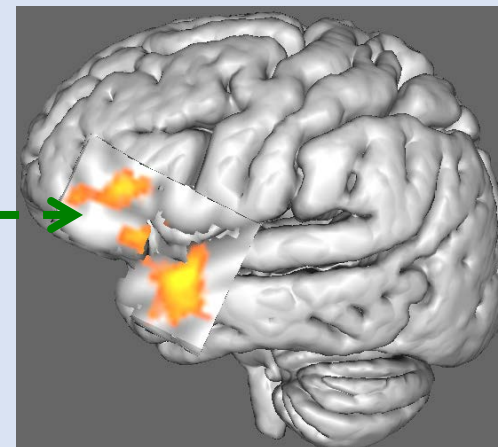
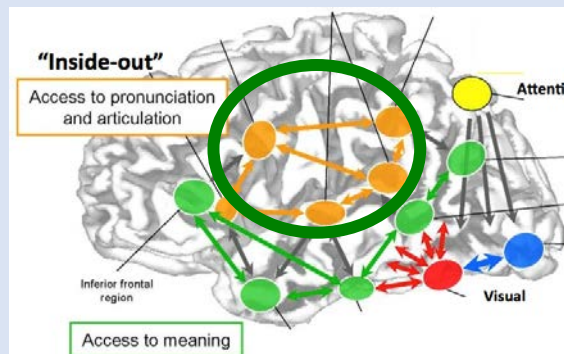
iPad is the New
Pacifier

Hirsh-Pasek et al. 2014
Zuckerman & Radesky, 2017

“Goldilocks” Effect in Mediums

Parent Book Reading > Audio Book > Animated Story

John Hutton



- Expressive language
- Complex language processing
- Social-emotional integration
- Working memory/attention

1. Adapted from S. Dehaene, “Reading the Brain,” 2010.
2. Hutton, et al. *In Submission*, 2016; presented at PAS 2016.

Evidence in Young : Changes in the Quality of Attention

Continuous partial attention
and multi-tasking

Requires high levels of
stimulation

Low-level threshold for
boredom

Bathed in fight/flight
hormones

More attention issues

“Trends in the US Adolescents’ Media Use: The Rise of Digital Media, The Decline of TV, and (Near) Demise of Print”

Displacement Theory

Read Print Daily

60% (1970s)

16% (2016)

82% today use social media

“Economy of Attention”: Less long
form, more quick media



Large Developmental Questions

Will changes in attention and the use of external platforms of knowledge threaten the formation of INTERNALIZED background knowledge and critical analysis in young digital readers?



Evidence from European Cooperation in Science and Technology's E-Read Network

Changes in attention in youth

Comprehension of text and sequencing of details better in print than on digital screens

Mangen & van der Weel, 2016

Guernsey & Levine, 2016

Baron, 2015; Katzir, 2018;

Barzillai, Thomson & Mangen, 2018



“Don’t Throw Away Your Printed Books: Meta-analysis of Print and Digital Media On Comprehension”

54 Studies

171,055 Participants

Print better than
Digital ($p < .001$)

- Across most genres
- Across timed conditions
- Increasing over the years 2000-2017



Delgado, Vargas, Ackerman, and
Salmeron; *Educational Research Review*
(in press)

Evidence in Adulthood: “Skimming is the New Normal”

EVIDENCE

1

Information increases along with skimming, browsing, keyword spotting; F or Z pattern of reading.

(Liu, 2005, 2009, 2014)

2

Less time on concentrated reading; more distractions (27/hr)

3

Decreased sustained attention and memory.

(Baron, 2014)



Implications for Reader

- If reading largely changes to adapt to digital characteristics:

We will reduce **deep reading**

with less time

to grasp **complexity**,

to understand another's **feelings and perspectives**,

to perceive **beauty**

Which leads to more susceptibility to false information and demagoguery;

all of which threatens a **democratic society**



The Contemplative Life of the Good Reader

“To read, we need a certain kind of silence...that seems increasingly elusive in our over-networked society...

(where) knowledge can't help but fall prey to illusion...that *speed can lead us to illumination*, that it is more important to react than to think deeply.

Reading is an act of contemplation...an act of resistance in a landscape of distraction.”

David Ulin



Stewards of the Next Generation

“It would be catastrophic to become a nation of technically competent people who have lost the ability to think critically, to examine themselves, and to respect the humanity and diversity of others.”

Martha Nussbaum

The Biliterate Brain: To Preserve and Expand A Convergence across Mediums

