

Aphasia Rehabilitation & Recovery from Novel Therapy

Thomas G. Broussard Jr., Ph.D.
C-STAR Lecture, USC Aphasia Lab
Discovery Building, Columbia, SC
2:00 PM-3:00 PM, April 6, 2017



Disclosure Statement

Financial: Dr. Thomas G. Broussard, Jr. receives royalties from his books, *Stroke Diary, A Primer for Aphasia Therapy* and *Stroke Diary, The Secret of Aphasia Recovery*. Dr. Broussard's book is self-published through Stroke Educator, Inc. He also receives speaking fees and honorariums for presentations and seminars. The USC Aphasia Lab is providing the honorarium for this presentation.

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Stroke
Diary

A Primer for Aphasia

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Stroke
Diary

The Secret of Aphasia Recovery

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YOUNG STROKE 12/14/16

9 OUTCOME MEASURES IN YOUNG STROKE 4:02-4:23

SOUVIK SEN, MD, MSc of SOUTH ALABAMA
PALMETTO HEALTH

GOOD BRAIN
PK

BIG STUDY

YOUNG STROKE, 12/27-12/29/15 JAX
CONF.

-LEFT ACTIVE
-GOOD
-GOOD HEAVEN!

YOUNG STROKE, < 65 YRS OLD
CARDIAC EMBOLISM

PATIENT PROFILE - 19 YRS (STROKE)
WHAT WAS HE LIKE BEFORE THE STROKE?

Agenda

1. The stroke experience
2. Rehabilitation: Speech-language pathology and novel steps to aphasia recovery
3. Neural plasticity: Definition and physiology
4. Conclusion





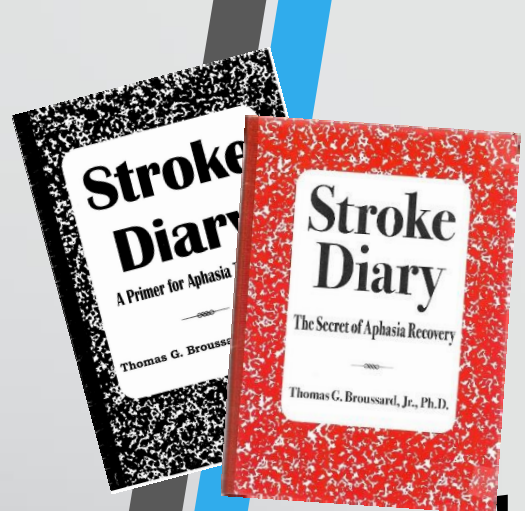
1. The Stroke Experience



Great detective story



The scene of the crime,
Monday, 9/26/2011



CVS pharmacy...

...310 feet with no
idea how it happened





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The illustrious chairs



EMT's, beginning of remembering



Neuro ICU



tPA drug, popcorn popping in my mind



Beautiful
views, unable
to say



Building, skyline, skyscrapers

Bits of Memory

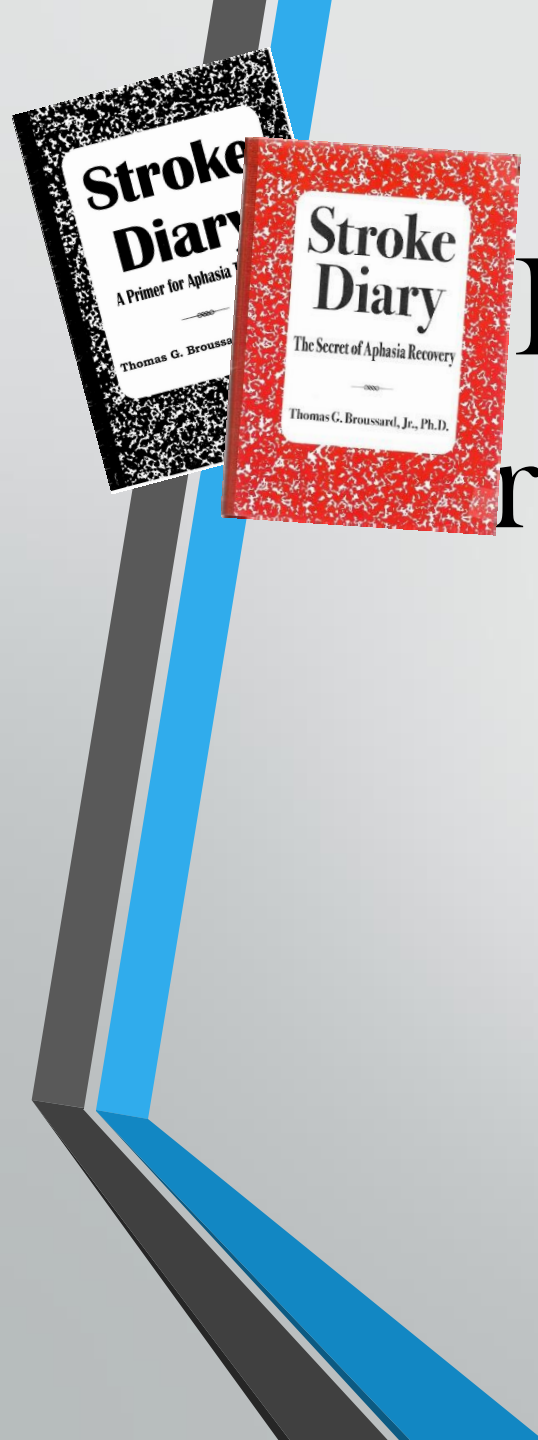
- Staring at my shoes
- Rusting pole
- Sitting in a chair, picking lint, watching the crowd
- Invisible cloak
- Popcorn popping



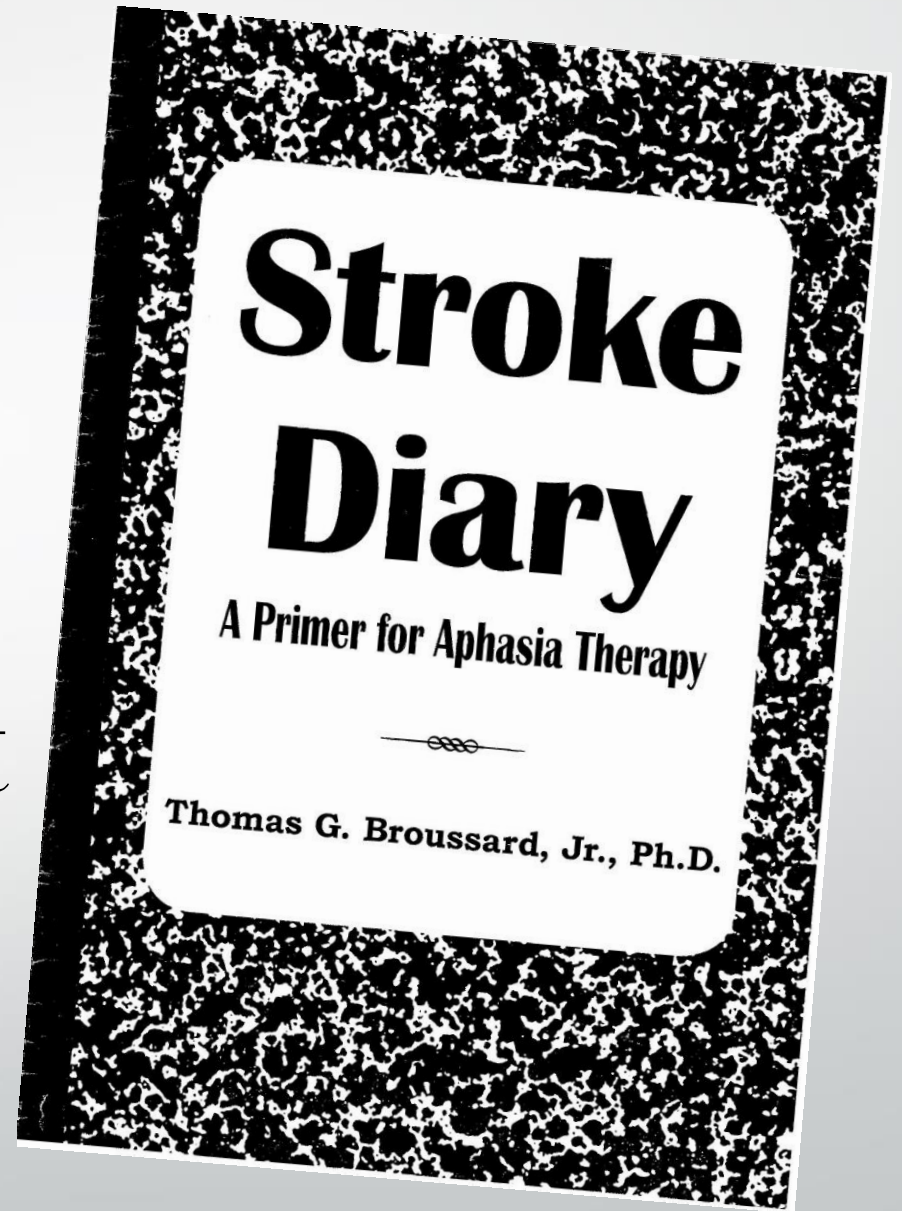
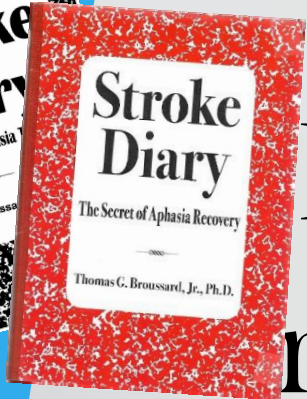
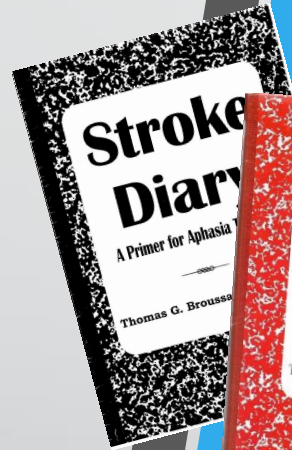


2. Rehabilitation:

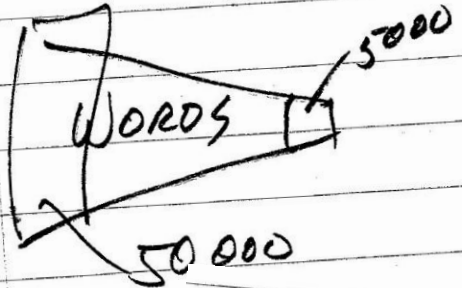
Speech-language pathology
and novel steps to aphasia
recovery



I couldn't
read, write
or speak
well.....but kept
my diary
anyway...

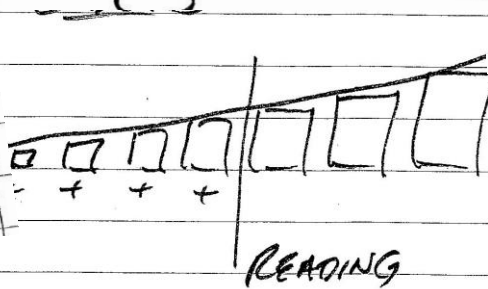
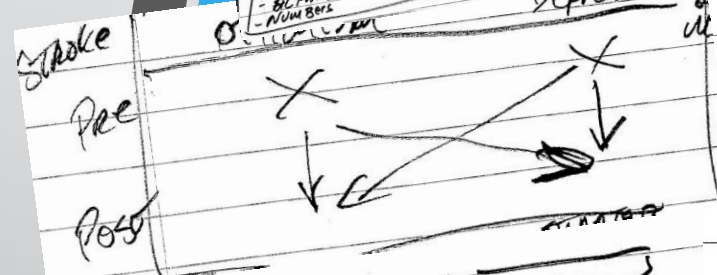
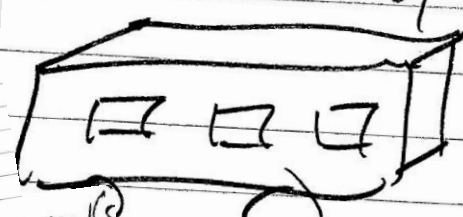


WAO, 11/2/11



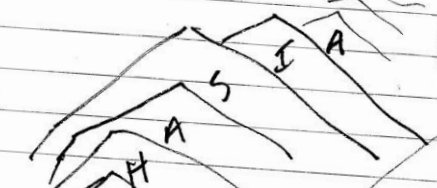
ANALOGY

OUT ANALOGY
ABSENT
VOWEL
SYLLABLE
GROUPING



EXPECT WORDS
WORDS KNOW THAT THOSE
IS STILL ABOUT CLEARING
VARIABLES ... WORDS SERIES

RESOURCE



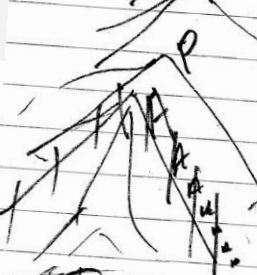
CLARK BELIEVE WANT
TO BOOK TO CURIOUS
SERIOUS IN
THE CHEMISTRY
IN BRAIN
SENSE, FRAGMENT, TIMELY, UP/DOWN,
GRAMMAR, TIME, SECRET



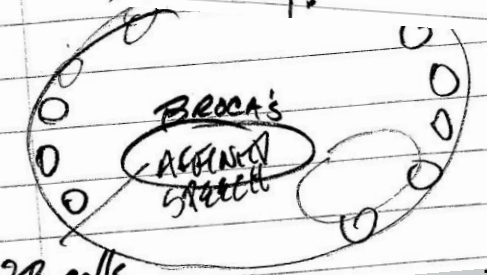
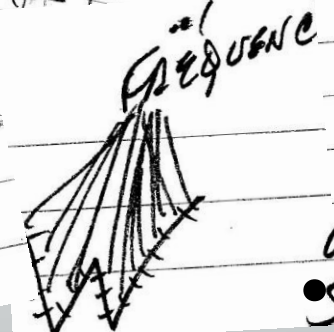
APHASIA

A	PIX	3 southern BOSTON
B	AX	WHY ALPHABET, WORD
	AX	ACCENT, ETC ONE

ORIGIN

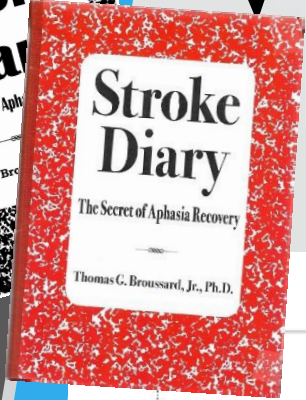
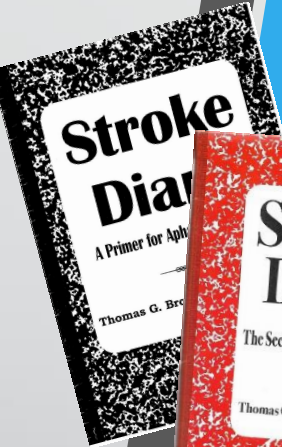


PLAYING
A
B
C
PLAYING FOR (SOME) TIME
SLOPE STARTED UP
SLOPE STARTING UP QUINCY



Aphasia Illuminated

Word Train Uncoupled



CLOAK BELIEVE WASTE
TO BOOK TO CURIOUS
~~SERIOUS~~ SERIOUS IN
THE CHEMISTRY
IN BRAIN



THURS, OCT 27, 2011

3 weeks?
155 days
620 hours

DESIGN BEING ~~CALENDAR~~ CALENDAR AND
AND DAY OF THE DESIGN, DAY IS
~~BEING~~ DURING "DAY" AND "MONTH"
(BRAIN SETTLE SET ONE AGE OF SET SETTLE)
LESSONS TO DOE SPELLING AND
SENDING OF DUAL SPELLING

The beginning of the beginning

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Evidence of Improvement

THURS, OCT 27, 2011

3:10-1:15
15:30
6:20
Hours

DESIGN BEING CALENDAR AND
AND DAY OF THE DESIGN, DAY IS
BEING DURING "DAY" AND "MONTH".
(BRAIN SETTLE SET ONE PAGE OF SET SETTLE)

LESSONS TO DO SPELLING AND
SENDING OF DATE SPELLING

10/27/2011

4/30/12

GRADUATION: CAN'T FOR OLD DAYS - REHEARSAL
WE ARE ALL THE SAME... ONLY DIFFERENT.

SEAN - SPENDING WELL MOTOR FUNCTION'S

WANDA → WANDA - JOSEPH'S
PROPER NAME GROUP
NEVER AND'S
PROGRESSIVE

ANDY - EACH TELL OUR STORY SHOW BUT...
JEFF - COMMUNITY, SEE NOT SCARED FROTHEN REEDS
CHUCK - HEAD

BILL - 3 in every day GET KEEP GOING
WANDA - SPENDING WELL PATIENCE
MARTI - TALKING COURAGE (GETS)
HOLIE - WE (SOUND) HIGH (LOW) FORGETS OTHERS
"BECAUSE" FEELINGS SUCCESS
ED - BILLS - HIGH! EVEN KILL
DIVERSE

NOT BEING S.P. GIVE "COMING" OR "EDITION"
5 SESSIONS FROM 8:12 UNTIL 11:00

DAVID (WATERMAN?) "FAST ENOUGH"
COURTESY SKIPS

4/30/2012

6/12/12

TUES, FLAGLER - VOL. ORANGE

PAUL

I HAVE HAD MANY DIFFERENT JOBS, I WAS IN THE NAVY AND NAVY SHIPBUILDING, THEN BUSINESS FOR 15 YEARS AND THEN HIGHER EDUCATION FOR 10 YEARS

JOAN
CHARLOTTE - OH
MARY
SABRINA - OH
STEVE
CLARA

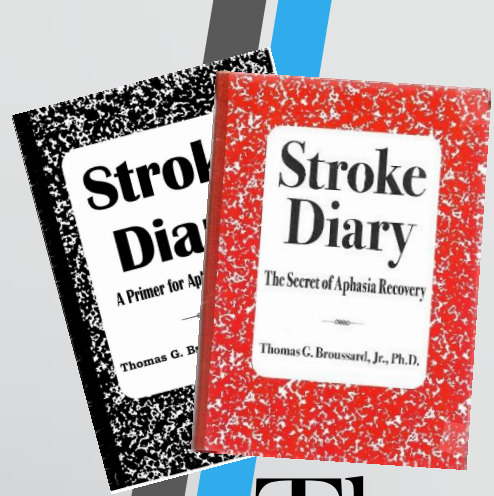
I HAVE WORKED AS A VOLUNTEER IN CITY YEAR, AMERICORPS, JUNIOR ACHIEVEMENT, NAVY LEAGUE AND MANY OTHERS.

6/12/2012

The Road to Recovery

- Conventional Speech Therapy (+50 hours)
- Intensive Speech Therapy (+150 hours)
- Enriched (and novel) Speech Therapy (+1500 hours)





Enriched Environment

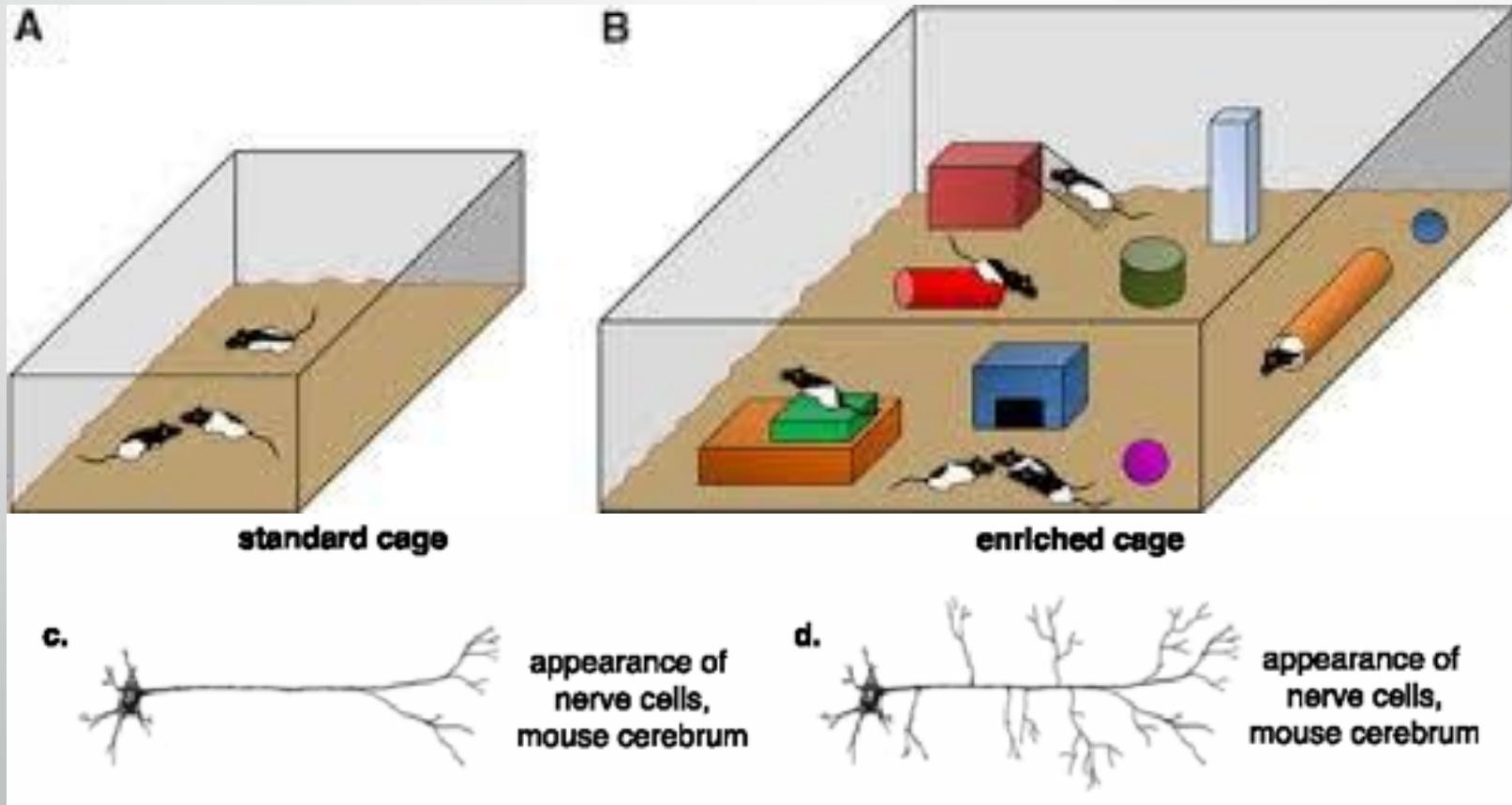
The standard definition of an enriched environment is “a combination of complex inanimate and social stimulation.”

Rosenzweig, M. R., Bennett, E.L., Hebert, M. & Morimoto, H. Social grouping cannot account for cerebral effects of enriched environment. *Brain Res.* 153, 563-576 (1978).

Enriched Environment

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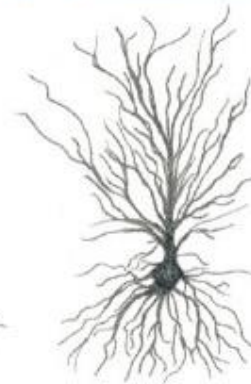


Enriched Environment



Impoverishment

- Stress
- Threat
- Hunger
- Boredom
- Frustration
- Lack of Interaction
- Harsh Relationships
- 100% Directed
- Passive Learning
- Irrelevant work

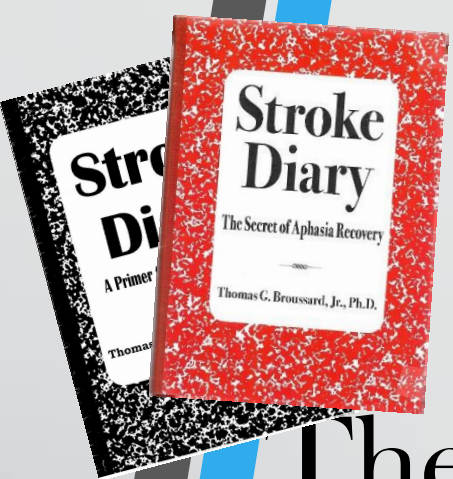


Enrichment

- Exercise
- Problem Solving
- Evidence
- Feedback
- Critical Thinking
- Challenge/Choice
- Interaction
- Diverse modalities
- Discovery
- Nutrition
- Socialization

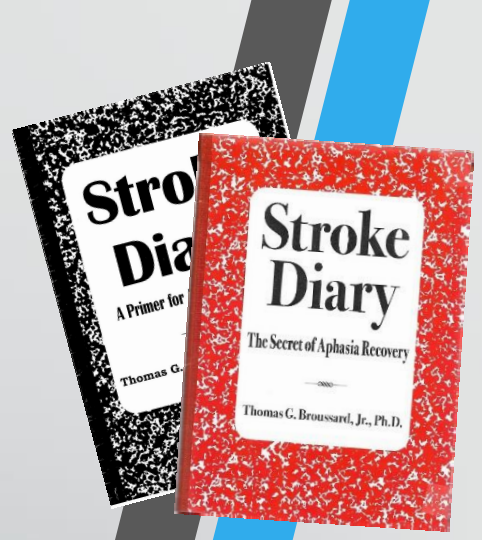
My Enriched Environment Included:

- ✓ Speech Language Pathology (SLP) Therapy
- ✓ Exercise (Walking as precursor to thinking)
- ✓ Evidence (Diary, voice recordings, pictures)
- ✓ Feedback (Immediate, minute to minute)
- ✓ Problem-solving/metaphors
- ✓ Socialization
- ✓ Interaction/active learning



Enriched Environment

The active ingredients of my recovery are hidden somewhere in the interaction between the bookends of motivation and practice...and the imperative of a brain that demands an active, diverse, and novel approach to discovery and learning.



3. Neural plasticity: Definition and physiology

Plasticity

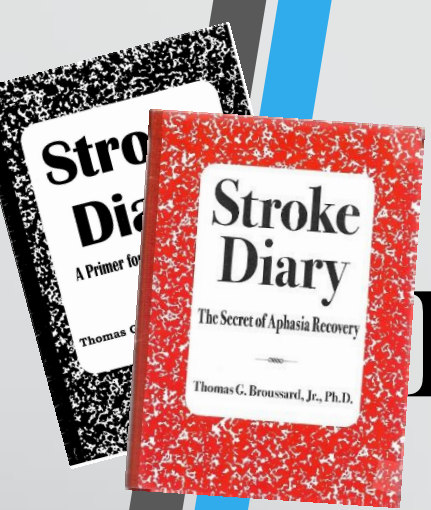
Plasticity, then, in the wide sense of the word, means the possession of a structure weak enough to yield to an influence, but strong enough not to yield all at once.

...our first proposition the following, that *the phenomena of habit in living beings are due to the plasticity* of the organic materials of which their bodies are composed.*

The Principles of Psychology (1890), William James
Habit, Chapter IV, pg. 105



Principles of Experience-Dependent Neural Plasticity



Impairments

1. Use It or Lose It
2. Use It and Improve It
3. Specificity
4. Repetition Matters
5. Intensity Matters



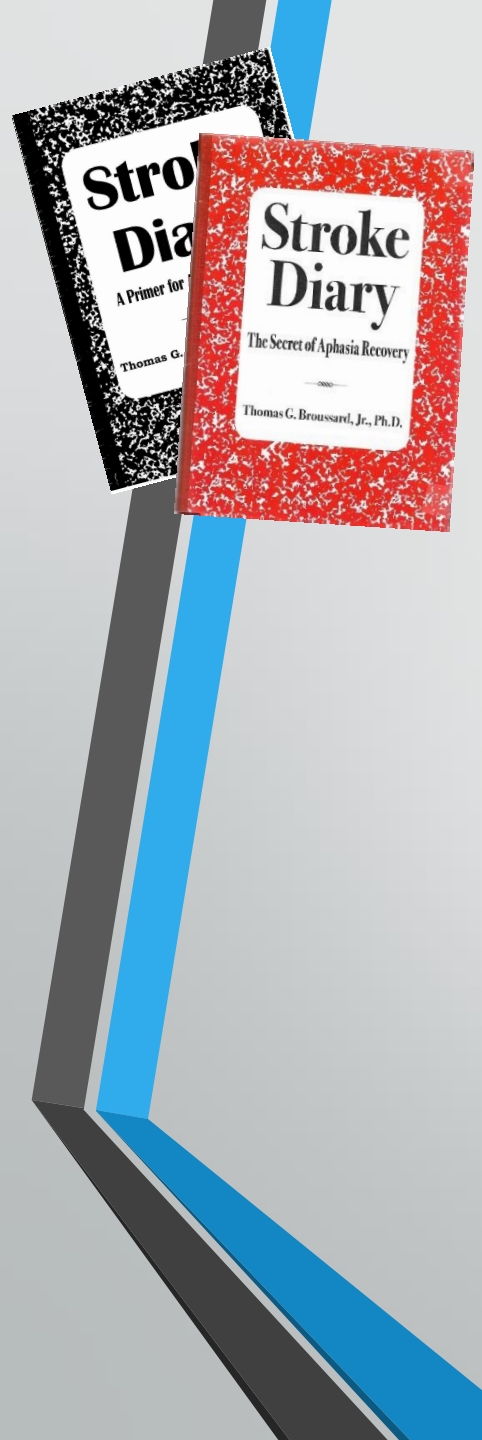
Improvements

6. Time Matters
7. Salience Matters
8. Age Matters
9. Transference
10. Interference

Kleim J, Jones T. (2008). Principles of experience-dependent neural plasticity: Implications for rehabilitation after brain damage. *Journal of Speech, Language, and Hearing Research*, 51, 225-239.

Plasticity

It is all about the **DOING!**



Experience-dependent activities induce plasticity

- Activities with varied modalities.
- Intensive activities (>20hrs/weeks).
- Repetition activities/duration.
- Personal relevance activities (salience).
- Interaction between activities.
- Keeping Track.
- Feedback.



Plasticity:

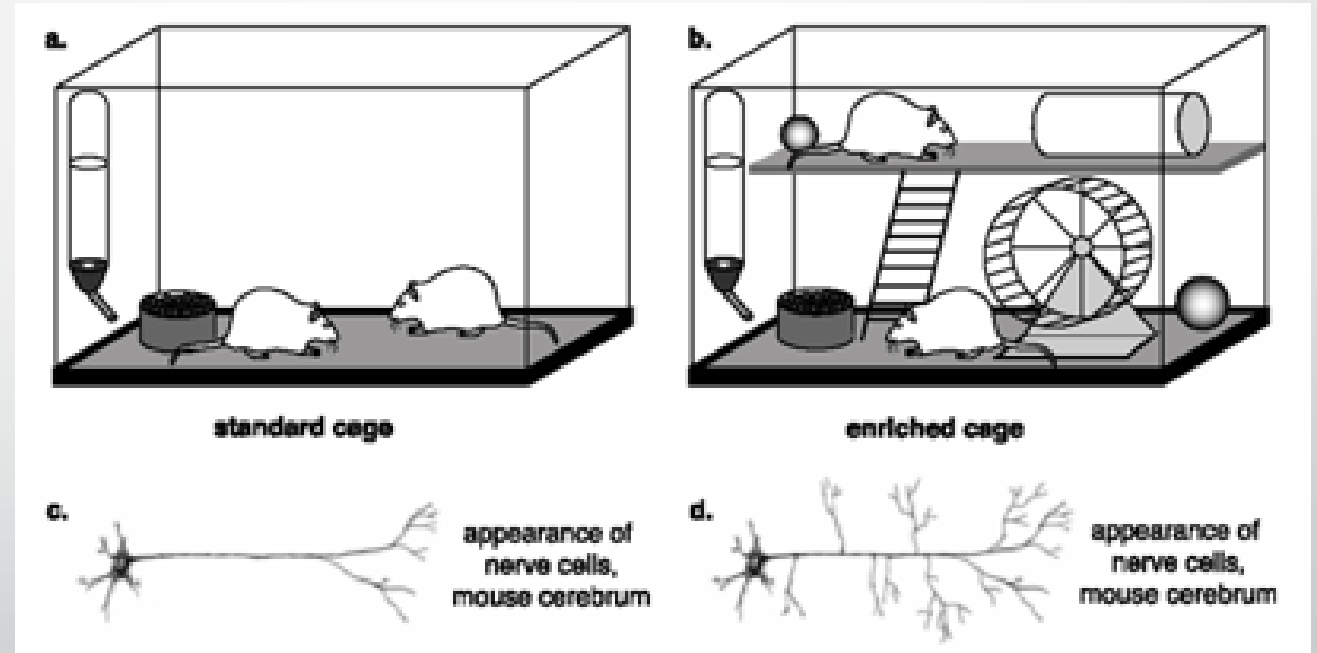
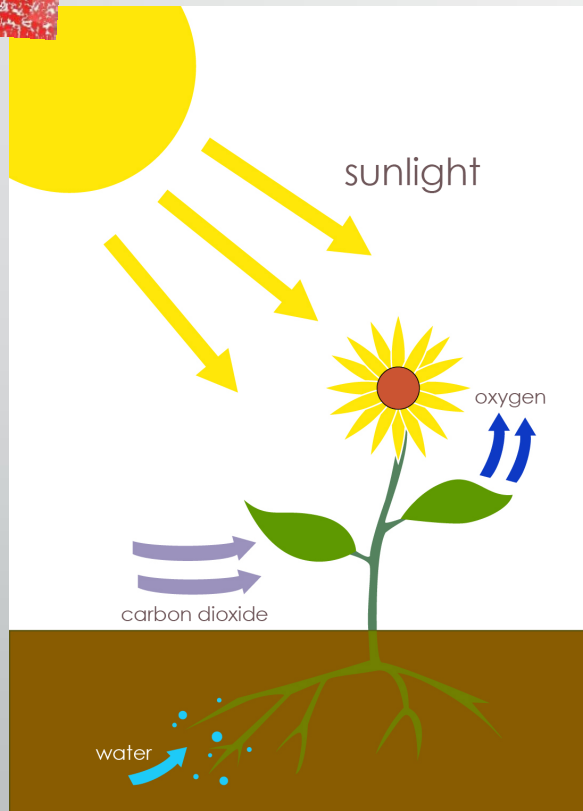
Learning by any other name



Photosynthesis & Plasticity

Light-dependent

Experience-dependent



Every Day is a Session Day



Problem solving

Feedback

SLP Therapy

Exercise (walking)

Pictures

Voice recordings

Wiki notes/research

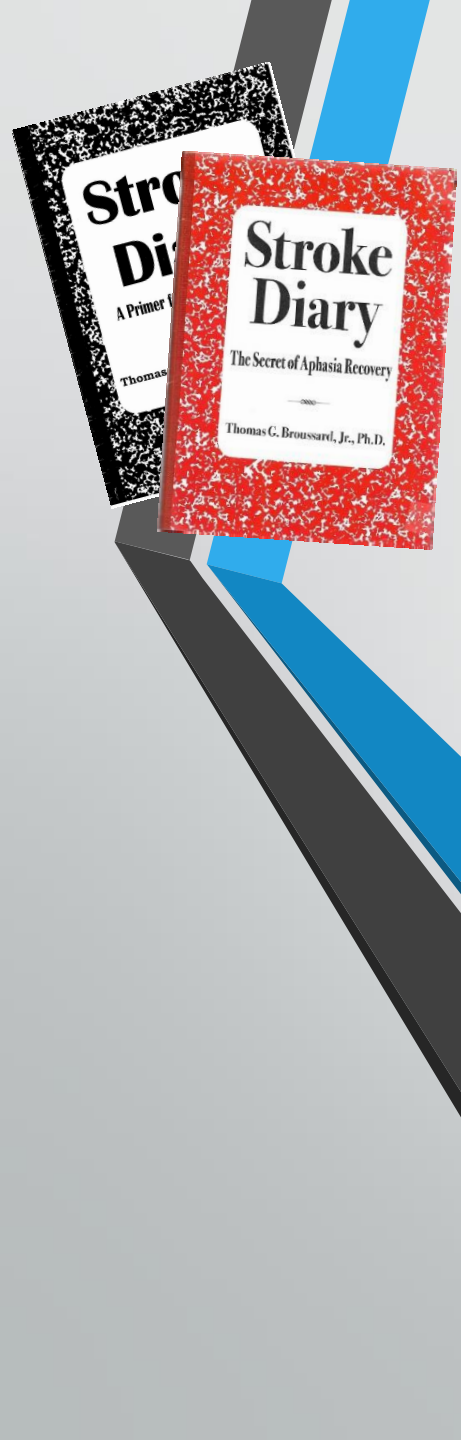
Diary

Reading

Socialization

Interaction





4. Conclusion



Recovery from Novel Therapy

- Long term personal perspective & practice.
- Long term enrichment tools (walking, active learning, diary, voice recording, pictures) needed on Day One.
- Awareness of deficits can and will come later.
- Word-finding and repetition are good but not enough.
- Other stimulating environments needed (socialization, other problem solving activities.)



Experience is the key.

But the *sequence* of the experience-dependent, induced-plasticity first requires evidence, then feedback, and then growing awareness, not the other way around.



Stroke
Diary

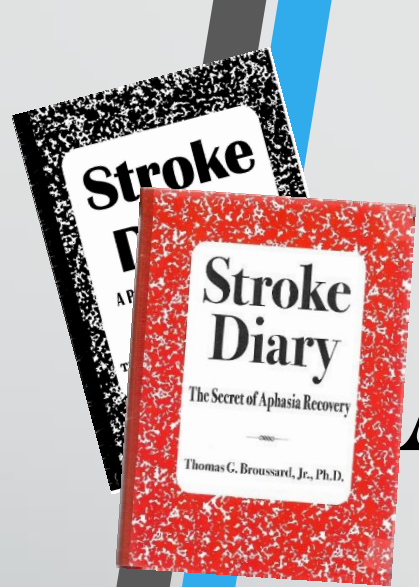
Stroke
Diary

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Interaction could be the ultimate
active ingredient

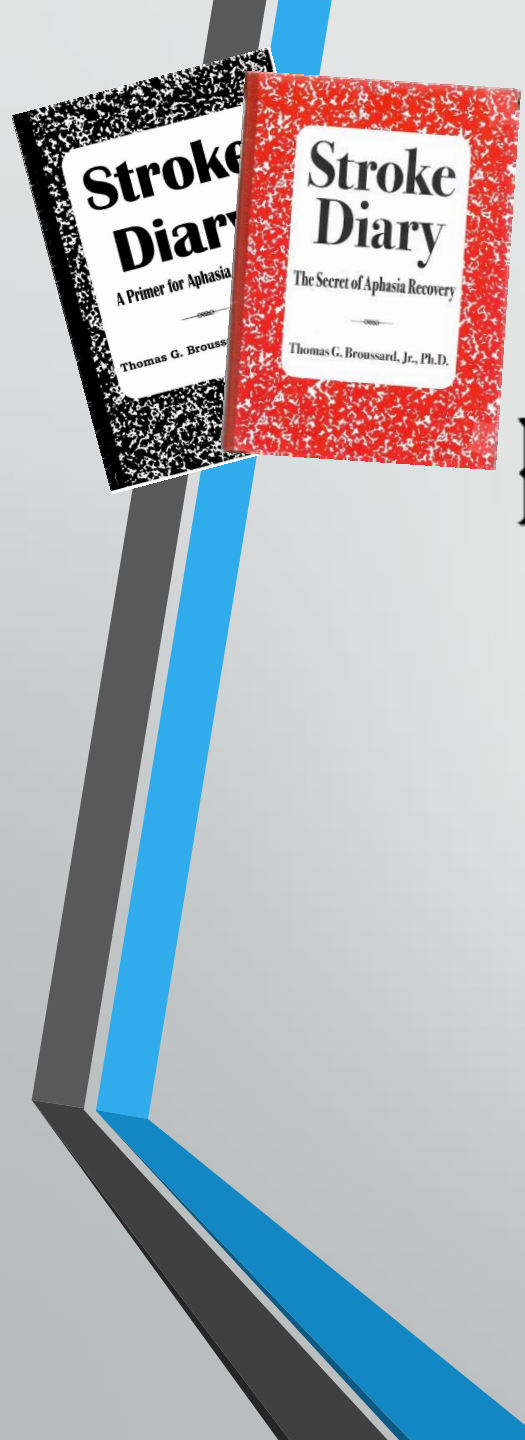
The *interaction (and active engaged learning)*, among a host of other factors, can be the ultimate active ingredient of enriched environment and resulted rehabilitation.



Aphasia gets better with therapy,
and substantially better with
enriched, intensive & enriched
therapy.

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HAVE APHASIA WILL TRAVEL



STROKE EDUCATOR, INC.

Thomas G. Broussard, Jr., Ph.D.

www.strokeeducator.com

tbroussa@comcast.net

207-798-1449