Aphasia Rehabilitation & Recovery from Novel Therapy

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C-STAR Lecture, USC Aphasia Lab
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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.

Non-Financial: Dr. Broussard has no relevant nonfinancial relationships to disclose.
Young Stroke 12/14/16

Outcome Measures in Young Stroke

Spurk, J. N., MD, Uof South Carolina

Good PK. Big Study. Palmetto Health

Young Stroke<65. 6/29/15 JAX

Cardiac Embolism

Patient Pre-1946 (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
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...
Aphasia illuminated
The beginning of the beginning
Evidence of Improvement

10/27/2011

THURS., OCT. 27, 2011

10/27/2011

Design being completed: Overview and Day of the Design Day 18

Lessons due: spelling and sending of due spellings

4/30/2012

THURS., APRIL 30, 2012

Saw - running with Miguel's children.

4/30/2012

I have had many different jobs. I was in the Navy and Navy Supplying, Missouri. I have been there for 10 years. Clara

6/12/2012

WED., JUNE 12, 2012

I have worked as a volunteer in City Year, Anderson, Junior Achievement, Navy Reserve and many others.
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.”

Enriched Environment
Enriched Environment

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

- 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
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

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
- Pictures
- Socialization
- Wiki notes/research
- SLP Therapy
- Exercise (walking)
- Voice recordings
- Diary
- Reading
- 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.
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.
References

• Leeuwen T, Manalo E, van der Meij J. (2015). Electroencephalogram recordings indicate that more abstract diagrams need more mental resources to process. Mind, Brain and Education, 9, 19-28.
HAVE APHASIA WILL TRAVEL

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