

Aphasia Insights!

March 2021
Volume 3, Issue 05
March 9, 2021

“Research on the neurobiology of learning and memory suggests that, for each new learning event, there is some necessary and sufficient change in the nervous system that supports the learning.” Pp. 226.

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.

Stroke Educator, Inc. is committed to educating the wider public about stroke and the 50 state “*Aim High for Aphasia!*” Aphasia Awareness Campaign.

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Aphasia Recovery & Word-Finding: *Neural Knitting by Any Other Name.*

By Tom Broussard, Ph.D.

I had been thinking about word-finding for a long time, trying to figure out how and why “word-finding” *as a process* actually works.

As far as I knew, the process of “word-finding” is the process of initiating certain activities and experiences that induce plasticity.

So, the question became: What *kind* of experience (that can induce plasticity) can create a number of behavioral changes for people with aphasia? The physical act of “word-finding” seemed to be one of them.

Much of my “research” had been about starting with my deficits and working backwards. The “behavioral changes” that I had seen in scientific articles were about “improving our language” and being able to speak again.

Word-finding is the process of trying to “find” words that can’t be “found.” It seemed that the more I “tried” (to find that word), the closer I got to “finding” it. The act of “trying” and “finding” must be one of many kinds of experiences that induce plasticity. Action verbs have agency.

All of the energy involved with *adding, changing, and creating*

neural matter *had* to have been the result of experience-dependent neural plasticity.

“Word-finding” is the jumping-

off point for the other verb activities that are linked to the neuronal networks and associated nerve fibers.

The “associated” actions present a host of described mental activities that, once activated, induce plasticity and learning.

The principles of plasticity include axioms such as “Use it or lose it” and “Use it and improve it,” which are important (Kleim, 2008). But what is the “it?”



There must be a direct link between the experience itself and the brain functions which lead to improvement of *that same function*.

I had been trying to describe the phenomena of “seeing” a word, while still being unable to “say” that word. I could actually “see” the word in my mind. It often felt like a marquee with bright lights in the middle of my forehead.

I didn’t know it at the time, but the more I “saw” the word, the closer I came to saying the word as well. Repetition is another one of the ten principles of plasticity.

Something must have been happening in the brain while I was in the process of *searching* for word-finding action words. The process of “searching” appears to provide the appropriate environment that also induces neural plasticity.

Certain action-oriented activities, set within an enriched environment, provide the opportunity for plasticity to occur. Once activated, plasticity provides the neural knitting required.

It is impossible for me to describe the *process* of how my brain got better. It is just as difficult to try to explain how knitting works. Like many things, the process of learning is through experiencing the process itself. The process provides the learning of the product.

Knitting is hugely repetitive and, once trained, knitters are unaware of the steps their hands are taking.

The brain performs many functions, like riding a bike or tying one’s shoes, without any conscious choices regarding the steps. Once “locked in memory,” the steps continue unabated.

Recovering one’s language from stroke and aphasia is a repairable process using repetitive action. Depending on stroke location, age and severity, recovery still occurs. But there must be a set of activities (conscious or not) designed to trigger growing components of neural plasticity.

Even though I had lost my language from aphasia, I was still capable of getting better, based on the unconscious steps within me. There must always be an urging step or therapeutic step, that induces the next (unconscious) step of plasticity.

Word-finding is one of the aphasia axioms regarding experience-dependent activities that induce plasticity.

The speech-language pathology world provides word-finding activities as a foundation for aphasia recovery. It really isn’t word-*finding* as much as creating and knitting the words that were damaged, given the *appearance* of being lost.

The act of *finding, searching, exploring, hunting, remembering, or imagining* a word and its resultant actions is the picture-perfect process of the act of word finding.

Of course, words are created (or knitted) rather than “found” (or woven) as part of the process. The lost words from aphasia still exist, yet are a faint trace (but still perceptual) of what they once were.

Every time the lost word is searched for, the trace becomes less faint and more visible. The act of “effortful trying” induces the appropriate act of “knitting” the word.

Every induced-dependent activity produces brain flows that create more dendrites, dendritic spines, synapses, and fiber. Billions of bits of built-up neural matter eventually recreate the lost words.

The more the *conscious* act is repeated, the more the *unconscious* internal act triggers a corresponding amount of growth with Plasticity Ink.TM

Signed: *The Johnny Appleseed of Aphasia Awareness; Author, Advocate, Activist*

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Article adapted from *Stroke Diary, Just So Stories...How Aphasia Got Its Language Back*, Chapter 31, Word Finding: How Words Need More Creating, Less Finding (Broussard, 2018).