



0. Your Brain on Writing - Story Preface

1. Your Brain on Story

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**4. Your Brain on Writing**

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Carl Zimmer, in his New York Times article "[Your Brain on Writing](#)," points to the surprising finding that brain areas of an NBA sports star while he does his work are the same areas that become active in the professional writer as they write. The amateur writer uses a different area of the brain. When one practices to the degree that an expertise is developed, in sports, writing, music or any field, a specific area of the brain becomes activated and supports extraordinary focus.

***For the first time, neuroscientists have used MRI scanners to track the brain activity of both experienced and novice writers as they sat down — or, in this case, lay down — to turn out a piece of fiction. The researchers, led by Martin Lotze of the University of Greifswald in Germany, observed a broad network of regions in the brain working together as people produced their stories. But there were notable differences between the two groups of subjects. The inner workings of the professionally trained writers in the bunch, the scientists argue, showed some similarities to people who are skilled at other complex actions, like music or sports. -Carl Zimmer***

Judy Willis, a neurologist and teacher-consultant with California's South Coast Writing Project, explains how the teaching of writing is important for learning based on neuroimaging and brain mapping. Dr. Willis brings a rare combination of expertise to the classroom: she's not only a teacher but also a neurologist. With a medical background in using such diagnostic tools as positron emission tomography (PET) scans, neuroimaging, and brain mapping, she empirically understands how the brain is wired to learn. With her experience with the South Coast Writing Project, Willis will tell you that the proof of writing's importance to learning isn't in the pudding—it's in the image of the brain at work.

***Consider all of the important ways that writing supports the development of higher-process thinking: conceptual thinking; transfer of knowledge; judgment; critical analysis; induction; deduction; prior-knowledge evaluation (not just activation) for prediction; delay of immediate gratification for long-term goals; recognition of relationships for symbolic conceptualization; evaluation of emotions, including recognizing and analyzing response choices; and the ability to recognize and activate information stored in memory circuits throughout the brain's cerebral cortex that are relevant to evaluating and responding to new information or for producing new creative insights—whether academic, artistic, physical, emotional, or social. Dr. Judy Willis***

***The following is an interview by the National Writing Project (NWP) of Dr. Judy Willis, on the impact of writing on the brain and on effective teaching:***

**What is a "positive brain state," and why is it crucial for learning?**

**Judy Willis:** The brain evolved to better protect the well-being of its owner and species. One way that this is important for the classroom is that effort and attention are limited commodities the brain parses out to the actions it predicts will be successful in protection or pleasure.

So, for example, when students participate in engaging learning activities in well-designed, supportive, cooperative groups, there is a positive emotional response in the brain. The pleasure of learning with one's peers increases the brain's release of dopamine, a neurotransmitter that increases pleasure, motivation, perseverance through challenges, and resilience to setbacks.

In addition, there is a beneficial response in the amygdala. The amygdala is a switching station (there's one on each side of the brain) in the brain's emotional-monitoring limbic system that determines if input will go to the reflective, higher cognitive brain (the prefrontal cortex) or down to the reactive, involuntary brain.

The brain scans of subjects learning in supportive and emotionally pleasurable situations show facilitated passage of information through the amygdala up to the higher cognitive brain, so learning associated with positive emotion is retained longer. Stress, however, determines if the intake is sent to that lower reactive brain.

**NWP: It sounds like the brain isn't wired for the traditional "drill and skill" approach often used these days to prepare for high-stakes testing.**

**Dr. Willis:** Exactly. Isolated skill practice is contrary to the brain's instinct to preserve its energy, because the brain does not tend to have the expectation of pleasure in such learning environments. On the other hand, when students know information will be used to create solutions to problems that interest them or to create products they want to create, that is when the brain predicts pleasure and applies efforts to achieve the desirable goal.

**NWP: How does writing figure into this?**

**Dr. Willis:** Writing is, by nature, an opportunity for creativity and personal expression. When writing is incorporated in learning and assessment, there is increased opportunity to produce the ideal situation for active, attentive learning because students value creative problem solving or creative production.

They're more likely to apply the effort, collaborate successfully, ask questions, revise work, and review foundational knowledge because they *want* to know what you *have* to teach.

## BOOKS BY JUDY WILLIS



- [Teaching The Brain To Read](#)
- [Learning To Love Math](#)
- [Brain-Friendly Strategies for the Inclusion Classroom](#)
- [Research-Based Strategies to Ignite Student Learning: Insights from a Neurologist and Classroom Teacher](#)

## ARTICLES BY JUDY WILLIS ON NWP.ORG

- [A Writing Activity to Help Students with Attention Disorders](#)
- [Poetry for Left-Brainers](#)

### Footnotes:

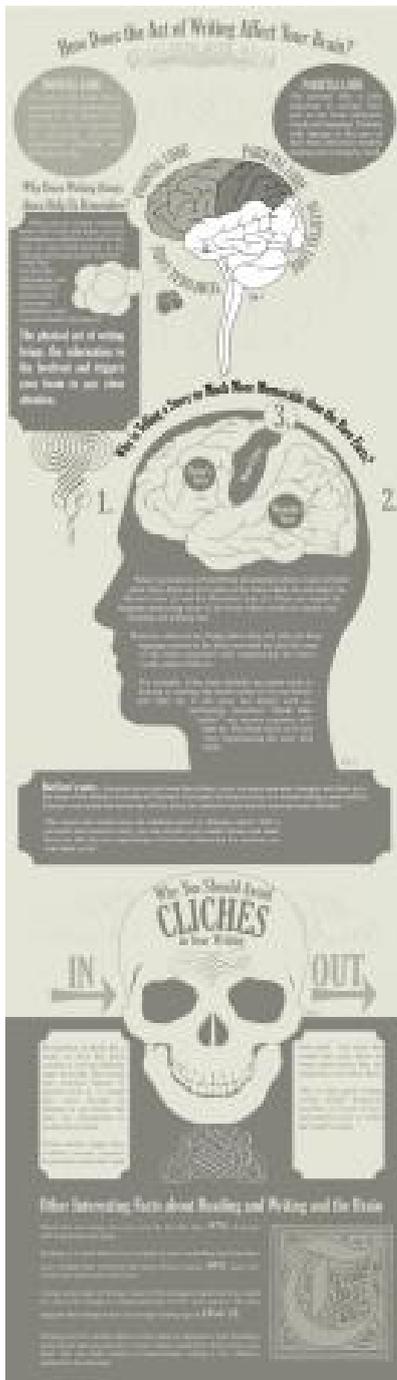
- 1) Zimmer, Carl, Your Brain on Fiction, New York Times, Jan/01/1970, Aug/01/2016, [http://www.nytimes.com/2014/06/19/science/researching-the-brain-of-writers.html?\\_r=0](http://www.nytimes.com/2014/06/19/science/researching-the-brain-of-writers.html?_r=0)

See Alignments to State and Common Core standards for this story online at:

<http://www.awesomestories.com/asset/AcademicAlignment/Your-Brain-on-Writing-Brain-Science>

See Learning Tasks for this story online at:

<http://www.awesomestories.com/asset/AcademicActivities/Your-Brain-on-Writing-Brain-Science>



## How the Act of Writing Affects the Brain

Many scientists have researched how we understand reading and writing, with interesting results. They have found out why stories help us to remember details better than lists and how our brains respond to descriptive passages.

Daily we write sentences, phrases, articles, without considering how writing affects our brain.

This infographic traces the effect the act of writing has on our brain. Writing can act as a powerful remedy to stress. This is a reason that psychologists recommend people to journal, reducing stress in the act itself in addition to insights the writing may bring

View this asset at:

<http://www.awesomestories.com/asset/view/How-the-Act-of-Writing-Affects-the-Brain>



## Writing on fMRI

New York Times, Dr. Martin Lotze, University of Greifswald

View this asset at: <http://www.awesomestories.com/asset/view/Writing-on-fMRI>