

Just The Facts, Ma'am

98. Stanford Study: Common Core Is Bad For The Brain

28 Thursday Aug 2014

POSTED BY PETER5427 IN EDUCATION

≈ 19 COMMENTS

Here is scientific proof from Stanford University that the Common Core way of teaching and learning is totally unnatural and definitely bad for brain development.

Kids' brains reorganize when learning math skills

<http://www.foxnews.com/health/2014/08/18/kids-brains-reorganize-when-learning-math-skills/>

The reason is simple.

(1) Common Core does away with the use of recall which is the brain's most efficient and fastest function.

(2) Common Core forces kids to be stuck in problem-solving analytical mode which is necessarily the brain's most deliberate, slowest function.

The Common Core "State" Standards manage to accomplish this feat by very explicitly, very deliberately doing away with "rote memorization" as a learning and teaching method. They do so in all subjects for which standards have been or still are being written. Instead, **Common Core imposes "child centered" as the only teaching method allowed**, according to which the children are organized into groups, and through discussion and consensus building they arrive an answer that they all agree on (whether that answer is right or wrong). **Common Core reduces the teacher to be a "guide on the side" spectator, not even discussion leader**, as the students are fumbling for answers in a tragic re-enactment of the blind leading the blind.

I wonder what more proof the education establishment needs to take another look and scrap Common Core, by whatever name they are calling it lately, stop its implementation immediately, and go back — YES, GO BACK to the good old days at least 50-60 years ago when

- (1) A teacher was still educated and screened rigorously before being allowed into a classroom,
- (2) She was free to use her professional experience and judgement to match the teaching method to the subject matter, the lesson and her students, which included lectures, presentations, demonstrations, readings, drills, exercises, lab work, library research, homework, term papers, individual and group projects, individual instruction as necessary, etc.; and
- (3) Yes, we WERE required to memorize addition and multiplication tables, poems, songs, historical dates and facts, scientific facts and formulas, etc.

The next page is the full text of the AP article, with my emphasis added.

19

It is based on

Hippocampal-neocortical functional reorganization underlies children's cognitive development : Nature Neuroscience : Nature Publishing Group

<http://www.nature.com/neuro/journal/vaop/ncurrent/full/nn.3788.html>

THIS IS HUGE.

There is nothing more to say about Common Core after this. Anyone who is still in favor of Common Core is either uninformed, willfully ignorant, or downright evil in the old fire-and-brimstone sense, but in either case definitely NOT motivated by the welfare of the children, the community or the country.

Kids' brains re-organize when learning math skills

Published August 18, 2014

Associated Press

Sometime in elementary school, you quit counting your fingers and just know the answer. Now scientists have put youngsters into brain scanners to find out why, and watched how the brain reorganizes itself as kids learn math.

The take-home advice: Drilling your kids on simple addition and multiplication may pay off.

"Experience really does matter," said Dr. Kathy Mann Koepke of the National Institutes of Health, which funded the research.

Healthy children start making that switch between counting to what's called fact retrieval when they're 8 years old to 9 years old, when they're still working on fundamental addition and subtraction. How well kids make that shift to memory-based problem-solving is known to predict their ultimate math achievement.

Those who fall behind "are impairing or slowing down their math learning later on," Mann Koepke said.

But why do some kids make the transition easier than others?

To start finding out, **Stanford University** researchers first peeked into the brains of 28 children as they solved a series of simple addition problems inside a brain-scanning MRI machine.

No scribbling out the answer: The 7- to 9-year-olds saw a calculation – three plus four equals seven, for example – flash on a screen and pushed a button to say if the answer was right or wrong. **Scientists recorded how quickly they responded and what regions of their brain became active** as they did.

In a separate session, they also tested the kids face to face, watching if they moved their lips or counted on their fingers, for comparison with the brain data.

The children were tested twice, roughly a year apart. As the kids got older, their answers relied more on memory and became faster and more accurate, and it showed in the brain. There was less activity in the prefrontal and parietal regions associated with counting and more in the brain's memory center, the hippocampus, the researchers reported Sunday in **Nature Neuroscience**.

The hippocampus is sort of like a relay station where new memories come in – short-term working memory – and then can be sent elsewhere for longer-term storage and retrieval. Those **hippocampal connections increased with the kids' math performance.**

"The stronger the connections, the greater each individual's ability to retrieve facts from memory," said Dr. Vinod Menon, a psychiatry professor at Stanford and the study's senior author.

But that's not the whole story.

Next, Menon's team put 20 adolescents and 20 adults into the MRI machines and gave them the same simple addition problems. It turns out that adults don't use their memory-crunching hippocampus in the same way. Instead of using a lot of effort, retrieving six plus four equals 10 from long-term storage was almost automatic, Menon said.

In other words, over time **the brain became increasingly efficient at retrieving facts.** Think of it like a bumpy, grassy field, NIH's Mann Koepke explained. Walk over the same spot enough and a smooth, grass-free path forms, making it easier to get from start to end.

If your brain doesn't have to work as hard on simple math, it has more working memory free to process the teacher's brand-new lesson on more complex math.

"The study provides new evidence that this experience with math actually changes the hippocampal patterns, or the connections. They become more stable with skill development," she said. **"So learning your addition and multiplication tables and having them in rote memory helps."**

Quiz your child in different orders, she advised – nine times three and then 10 times nine – to make sure they really remember and didn't have to think it through.

While the study focuses on math, Mann Koepke said **cognitive development in general probably works the same way. After all, kids who match sounds to letters earlier learn to read faster.**

Stanford's Menon said the next step is to study what goes wrong with this system in children with math learning disabilities, so that scientists might try new strategies to help them learn.

(Which reminds me... Common Core also has NO provisions for children with special needs.)

Hippocampal-neocortical functional reorganization underlies children's cognitive development

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Journal name: Nature Neuroscience

Year published: (2014)

DOI:doi:10.1038/nn.3788

Received 29 April 2014

Accepted 17 July 2014

Published online 17 August 2014

Abstract

The importance of the hippocampal system for rapid learning and memory is well recognized, but its contributions to a cardinal feature of children’s cognitive development—the transition from procedure-based to memory-based problem-solving strategies—are unknown. Here we show that the hippocampal system is pivotal to this strategic transition. Longitudinal functional magnetic resonance imaging (fMRI) in 7–9-year-old children revealed that **the transition from use of counting to memory-based retrieval parallels increased hippocampal and decreased prefrontal-parietal engagement during arithmetic problem solving**. Longitudinal improvements in retrieval-strategy use were predicted by increased hippocampal-neocortical functional connectivity. Beyond childhood, **retrieval-strategy use continued to improve through adolescence into adulthood** and was associated with decreased activation but more stable interproblem representations in the hippocampus. Our findings provide insights into the dynamic role of the hippocampus in the maturation of memory-based problem solving and establish a **critical link between hippocampal-neocortical reorganization and children’s cognitive development**.

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thoughts on “98. Stanford Study: Common Core Is Bad For The Brain”

1. *said:*Jennifer2014 September 4 at 18:23

Excellent information! I will be sending this to the school board. Thank you!

REPLY○ *said:*Joe Vanpelt2016 February 23 at 20:30

I am curious as to whether or not the common core standards are a good idea especially sense the past 40 years have yielded little to no innovation that America is known for. While some people want to live in the past, the industrial era is over and it is time to move into the technological age we have been so hesitant to enter. When looking into all the factors involved in this matter one must think creatively or critically before assume something new will not work. Most people that envisions something new is always rebuked by uneducated people until an educated individual comes along and proves it to be so, usually long after the originator died. I believe strongly that problem-solving and critical thinking go hand in hand and until you can show me one school curriculum that these are core values and students graduate from high school mastering then I will take the side of making that schools curriculum mandatory in all schools, just like the unknown projects most people know nothing about that the government is sponsoring for perfectly aligned learning systems that will reveal results that will be more then enough evidence, at the lowest student scores, to shut uneducated people as yourselves mouths up for good.

REPLY2. *said:*EricS2014 September 5 at 03:19

I'm not a fan of Common Core, but when I read the CC Math Standards (http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf) , for instance 2nd grade: "2.OA.2 Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers." For 3rd grade it says, "3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division. By the end of Grade 3, know from memory all products of two one-digit numbers."

My kids were home schooled the last few years, and one of the tools we used for math fact memorization was a web site called "Reflex Math", which happens to advertise their CC focus and quotes both of those sections (among others).

I agree with the Standford study, but not with your correlation to CC.

REPLY○ *said:*[peter5427](#)2014 September 8 at 09:20

Thank you for the comment, but you are kidding, right?

First of all, as I recall from my childhood, by third grade we were supposed to do far more than what you quoted from CCSS math. Any way you look at it, CCSS is a huge step down.

Secondly, what the heck do you expect a publisher to say in this business environment, that they are NOT Common Core compliant?

Thirdly, as I have explained, and as the articles I cited explain, by emphatically discouraging memorization that comes naturally especially in the early years, Common Core is delaying and inhibiting normal brain development. Incidentally, a BBC article reports that their new "rigorous" standards very much emphasize memorization of math, science, history and literary facts in the early years; quite the opposite of Common Core. Likewise in several provinces in Canada.

I am glad yo had the good sense to home-school your kids. Hopefully you will keep up the good work.

REPLY

- *said:*[peter5427](#)

2014 September 8 at 09:33

A recent bruhaha over Common Core math was triggered by an examples from the THIRD grade, in which a "math" lesson and a "math" problem was centered on full length study of the "Rights of Man" from the French revolution, "Universal Declaration on Human Rights" and the children's version, both from the UN. The only excuse for any math in this lengthy lesson was that at one point they asked how much it would cost to do a project to illustrate something in these documents.

The study of these lengthy foreign documents would be appropriate in a CIVICS class, not in math. And it would be appropriate if and only if it's done by contrasting them with the simplicity and elegance — and therefore the superiority — of the American versions (Declaration of Independence, Bill of Rights).

Unfortunately it's too early to do that in the elementary grades, because

First you have to understand the difference between individualist and communitarian philosophies and why the former is superior to the latter.

Then you have to understand the differences between the practical manifestations of these philosophies, such as free enterprise vs. "social justice economics," or "social justice" anything, and why the former is superior to the latter.

Then you have to understand the (1) pioneering foundational works such as the Magna Carta, "Wealth of Nations" and other philosophical treatises from the Scottish Enlightenment, and of course the Federalist and anti-federalist Papers, and contrast them with (2) The Communist Manifesto and its endless derivatives whether from the Left or the Right, and why the former is superior to the latter.

Then you have to understand the difference between immutable objective natural law and malleable arbitrary subjective man-made law, and why the former is superior to the latter.

And finally you have to understand that math and science (as well as vocabulary and grammar) are TOOLS, not philosophical or moral statements. They also happen to teach, both explicitly and implicitly, respect for analytical verifiable objective absolute truth and logical consistency, not arbitrary subjective "reality"... and therefore I am sure the social engineers do look at them as expressions of inconvenient, counterrevolutionary, subversive philosophical and moral principles.

This is heavy fare even for adults. If anything like this is dumped on children, especially the lopsided material from the UN presented totally out of context as is The Common Core Way, it can only amount to indoctrination and child abuse. I thought there are laws against child abuse.

I would start with the simple facts of American history and go into gradually deeper detail in the higher grades.

o *said:EricS*

2014 September 8 at 09:34

No, I'm not kidding, and I'm not going to defend CC as I don't like any federal noses in my local school's business. I applaud your tenacity in watch-dogging the CC crap (and there's plenty of stuff to complain about in it), but I feel that your article is misleading people to thinking that Stanford actually said something about CC specifically when they did not, and your statement that, "Common Core does away with the use of recall which is the brain's most efficient and fastest function.", is plainly false. A more accurate statement might be, "Common Core does not stress memorization of math facts enough or at an early enough phase." – but that would be subjective and, I suppose, not as inflammatory.

When my son was in K-3 here in the DFW, TX area in 2006-2009, in what is supposed to be an "Exemplary" rated school (by Texas assessment crap standards), they did not memorize those facts at all. This is a state that doesn't do CC and has recently passed legislation to prohibit the school board and districts from using it for assessments. CC curriculum would have been an improvement over what he was being taught. (again, I'm not asking form CC, just saying in this example it would actually have had him memorizing those same math facts)

Anecdotally, it was in the 3rd grade in the late 70's (in Phoenix, AZ, PVUSD), that I remember memorizing my multiplication tables so I don't see how the CC schedule on this matter is any different. (FWIW, I've been a very successful software engineer/architect for 20+ years now so I think my math skills turned out fine.)

As I said, CC has plenty of problems, making one up to fit an argument that can so easily be disproved is not helping your cause.

3. *said:EricS*

2014 September 8 at 09:37

Replying to your second comment, about the civics lesson in the math problem: I agree 100%! THIS is the kind of BS that needs to be reported loudly and often.

REPLY

- *said:*[peter5427](#)

2014 September 8 at 10:08

With respect to your previous reply, evidently you are confusing the grandiose but misleading bureaucratise in the standards with the actual practice in the classroom. Everything in CCSS discourages, with sneering remarks such as “drill and kill,” all notion of memorization in all subjects at a time when the studies show the brain is trying to reorganize itself to work more efficiently. Note that the studies also show that kids deprived of this growth experience also suffer from that deficit in later years. So yes, most emphatically CCSS is bad for the brain.

REPLY

- *said:*EricS

2014 September 8 at 10:19

“grandiose but misleading bureaucratise”?

CC standards say:

* 2.OA.2 Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.

* 3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division. By the end of Grade 3, know from memory all products of two one-digit numbers.

What part of those is misleading?

For example, one of the tools we’ve using in homeschooling, a web based math game called “ReflexMath.com”, is dedicated to rote memorization of math facts sites and those exact things are listed as a reason it is “Common Core focused”. See:

<https://www.reflexmath.com/commoncore> (the above CC bullets were copied from that web page)

- *said:*[peter5427](#)

2015 August 24 at 09:15

AIn the meantime they are busy repackaging the same crap under new names. The latest one is “eurika math.” If what they are doing is so great, why the need to re-invent and re-invent, re-package and re-package? ALL OF THIS has been done very well, and very differently, in countries that for many decades have consistently been in the top 5 for math.

- *said:*[peter5427](#)

2014 September 10 at 06:47

With respect to your latest reply, I have unapproved it because (1) you are repeating yourself; (2) evidently you don’t know the difference between the CCSS and Reflex Math; (3) you are going off-topic, off on a tangent. The topic here is the Stanford study on brain development, and the

objections — from me, the authors of the news report, and the authors of the study — to the delay in brain development fostered by a method of teaching and learning which just happens to be the Common Core Way..

REPLY

4. Pingback: [Common Core is Bad for the the Brain | HiTechBob](#)

5. *said:*[jocklerdigest](#)

[2015 April 27 at 21:21](#)

I'm totally with you Peter. The way Common Core strips the next generation of its basic arithmetic is absurd. I'm a 14 year old and already writing articles in papers against this atrocity. Like all matters in education, money is the main influence. Two sides of a story. One makes it sounds so good. The other spills the truth. Good job supporting your ideas!

REPLY

6. *said:*[KFR](#)

[2015 June 21 at 04:03](#)

My Aunt works at the Red Lab (Research in Education Lab) at Stanford and by all accounts they have no issues with CC. I am missing the connection between the article cited and a denouncement of CC by Stanford.

REPLY

◦ *said:*[peter5427](#)

[2015 August 24 at 09:09](#)

Then please re-read the part about the MRI studies that show the parts of the brain that light up under the various tasks and modes of problem solving.

REPLY

7. *said:*[Jean Soyke](#)

[2015 August 24 at 08:30](#)

This research really doesn't add much new to what scientists already know about the brain and learning. However, the study is based in neuroscience, which means that using it to support an anti-Common Core stance is really a stretch.

REPLY

◦ *said:*[peter5427](#)

[2015 August 24 at 09:07](#)

Facts are facts...

REPLY

8. *said:erniezarraphd*

2015 September 6 at 05:34

Thanks for sharing. I address neuroscience in my last two books, with particular emphasis on learning in my most recent book, *THE WRONG DIRECTION FOR TODAY'S SCHOOLS: THE IMPACT OF COMMON CORE ON AMERICAN EDUCATION* (July 2015 Rowman & Littlefield). Stanford math professor, and member of the Common Core Validation Committee, wrote the Foreword for my book. Children's brain are highly plastic and gender differences in learning are real. A one-size-fits-all is most inefficient and deleterious to the developing brain, let alone to creativity and innovation.

REPLY

o *said:peter5427*

2015 September 6 at 07:34

Dr. Zarra is too modest to blow his own horn. See the reviews on Amazon:
<http://www.amazon.com/The-Wrong-Direction-Todays-Schools/dp/1475814275>

The questions remains; with all the evidence piling up against Common Core, why is the education mafia — supposedly intending to do nothing but good “for the children” — not paying attention and mending their ways? Everything we say and do is just water off a duck's back...

REPLY

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