

Insights from Neuroscience, Psychology, and Teaching into How to Educate the Heart, & not only the Head



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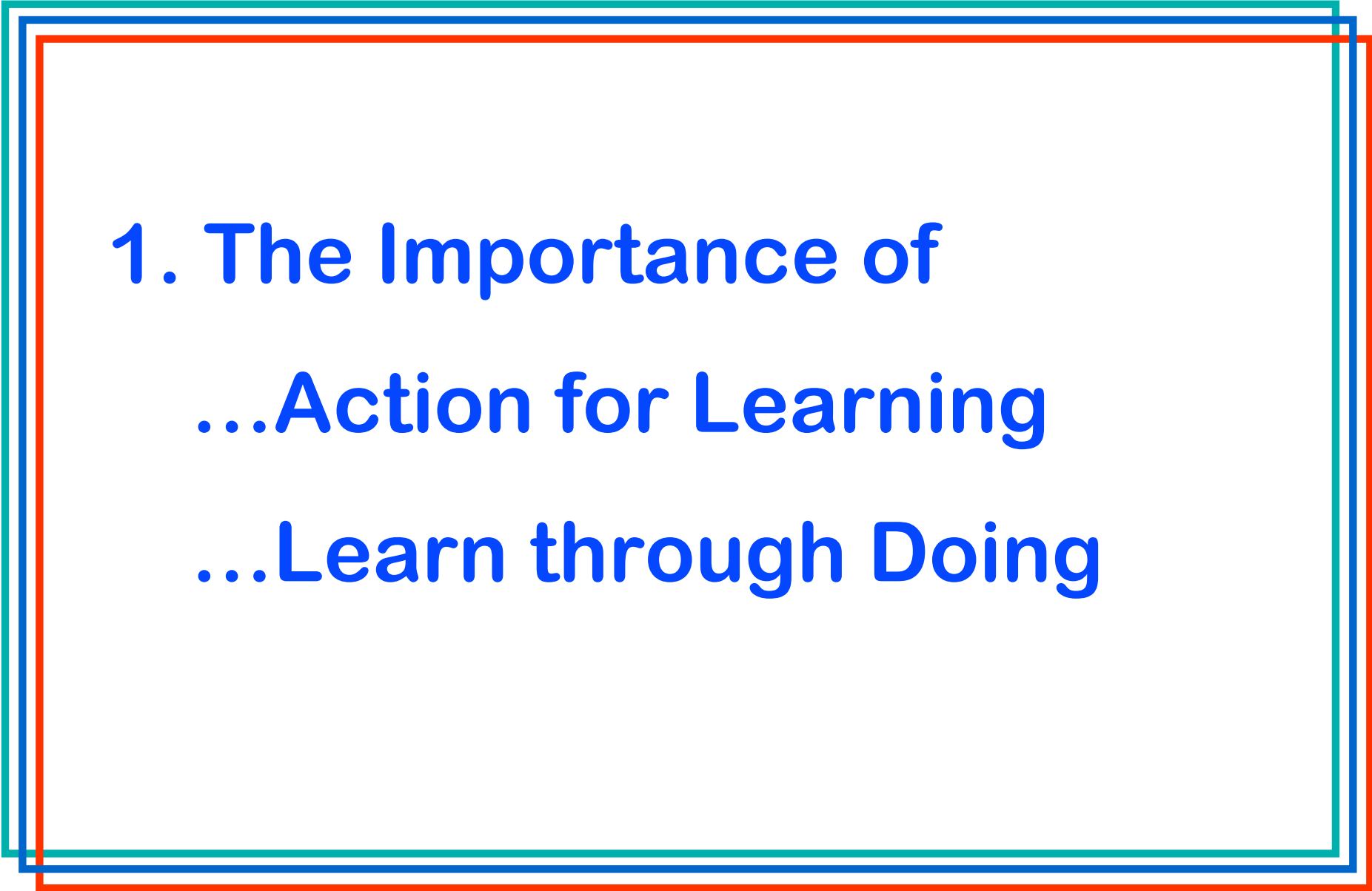
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From Jan. 5 onward
a copy of this talk will be available
online at:

www.devcogneuro.com/videos/SIKKIM.ppt



1. The Importance of

...Action for Learning

...Learn through Doing

The Dalai Lama has said:

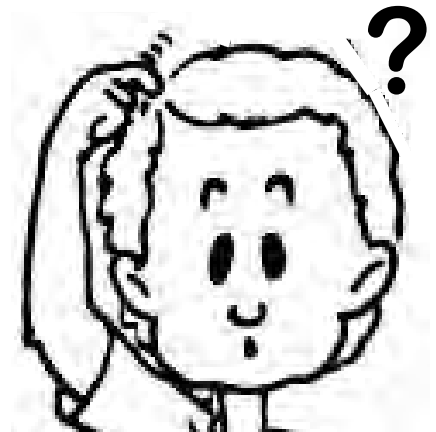
**If you want others to be happy,
practice compassion.**

makes perfect sense, even to a child



**If you want to be happy,
practice compassion.**

huh?



For students to understand the
deep truth of:

“if you want to be happy,
practice compassion”

they need to practice
compassion and experience for
themselves the joy it brings them

**“The act teaches us the
meaning of the act.”**

-Rabbi Abraham Heschel

We can tell children that

**... people have more in common than they
have differences**

**... they should not fear or dislike people simply
because they come from a different culture**

**But preaching in the abstract is not the same
as experiencing**

**Children need to meet
others from different
ethnic groups**

**They need to work
alongside them to
achieve a common
goal (as on a team)**



They need to learn not to fear or
exclude them; they need to see
commonalities *for themselves*



a Chinese proverb:

I hear, and I forget.

I see, and I remember.

I do, and I understand.

2. The Importance of Repeated Practice

**If students act as if they are good,
they will become good.**

**The way to produce compassionate students
is to have them practice compassion day in
and day out, throughout every day.**

“We are what we repeatedly do.

Excellence, then, is not an act, but a habit.

We do not act rightly because we have virtue or excellence, but we rather have these because we have acted rightly; 'these virtues are formed in a person by doing the actions';

we are what we repeatedly do.”

Aristotle, *Ethica Nicomachea*, 4th century BC

Three Acts of Kindness EVERY Day

(Joy YOU get when you bring a smile
to someone else's face)

can be very simple and small acts

say 'thank you' - perhaps the person who
hands you your school lunch or the bus driver

hold the door for someone

compliment someone: "great smile"; "I like your shirt"

offer your seat to an older person

help someone carry a heavy load

let someone else play with the toy you wanted

comfort someone who is upset

ask someone sitting on the sidelines to join in your game

help without being asked

**“We preserve memory through story....
You are what you remember, and what
you remember are stories.**

**By remembering and retelling tales of
[your] kindness, you create a self that is
loving and kind.”**

**-- Rabbi Rami Shapiro
The Sacred Art of Lovingkindness**

Each day, students should write down the nice things they have done in a private journal (not to hand in for praise or reward).

Each week they should write down the one nice thing they did that gave them the most joy, and hand that into the teacher.

PAY IT FORWARD

In the book and movie, **Pay it Forward**, a schoolboy does a favor for another person - insisting that instead of repaying him, the recipient “paying it forward” by doing favors for three other people, telling them to similarly “pay it forward.”

In this way, helping one another could spread exponentially.

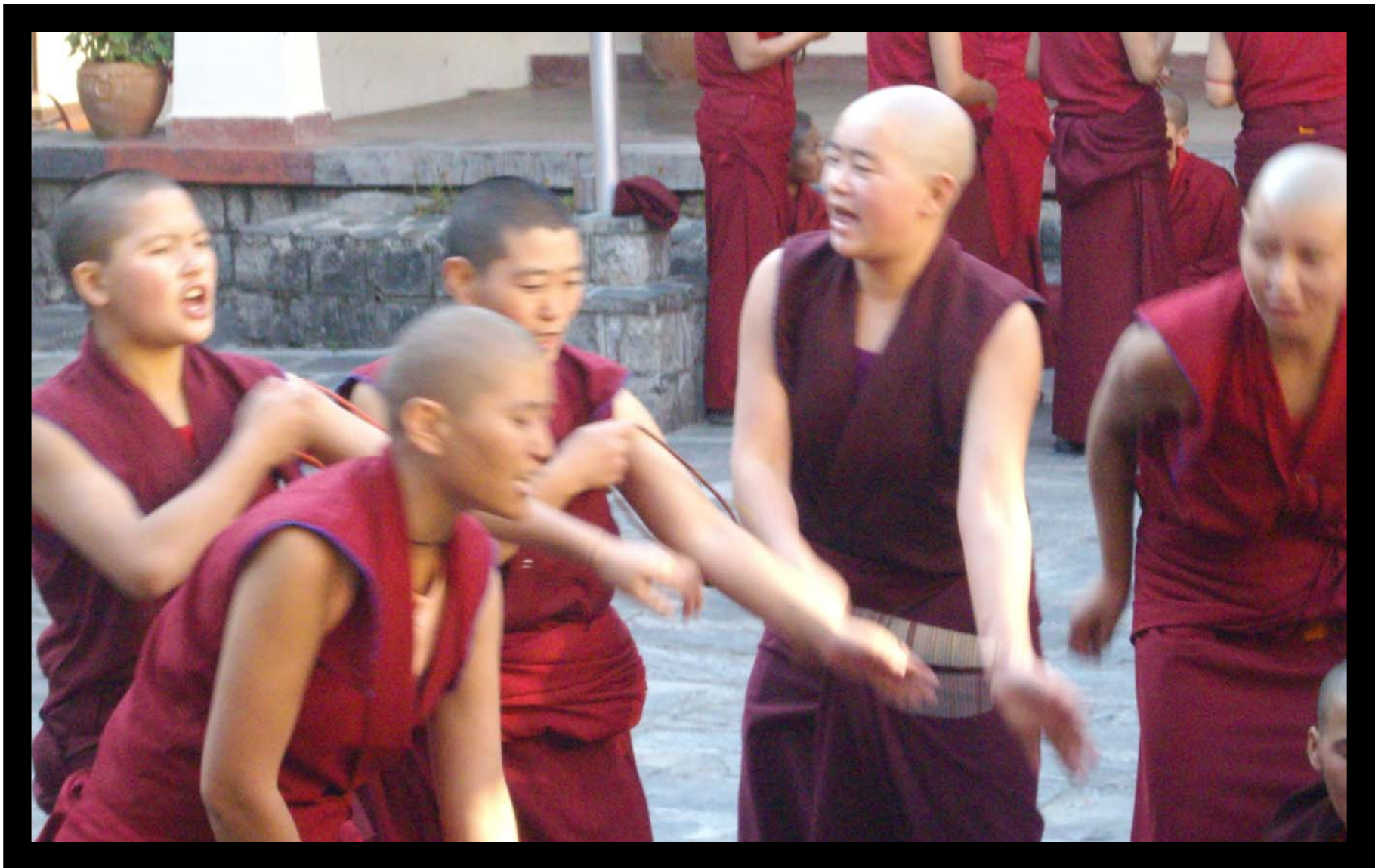
The Pay it Forward Foundation brings this idea to schoolchildren, encouraging them to take an active role in making the world a better place.

Dyskolos -- prizewinning play in ancient Athens in 317 BC.

The concept was rediscovered and described by Benjamin Franklin in 1784: “ I do not pretend to give such a Sum; I only lend it to you. When you ...meet with another honest Man in similar Distress, you must pay me by lending this Sum to him; enjoining him to discharge the Debt by a like operation, when he shall be able, and shall meet with another opportunity.



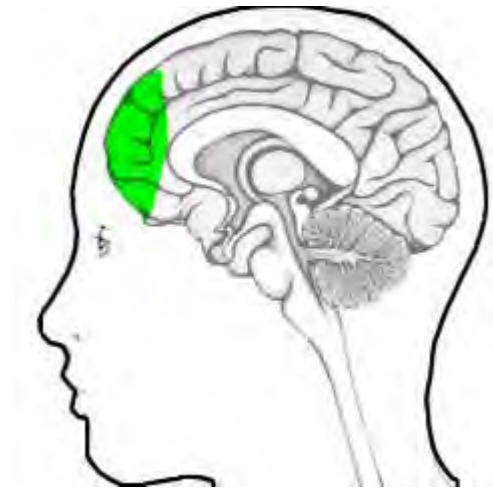
**We think of questions,
but we are too shy to ask them.**



at Drolma Ling Nunnery founded by Rinchen Khando Choegyal

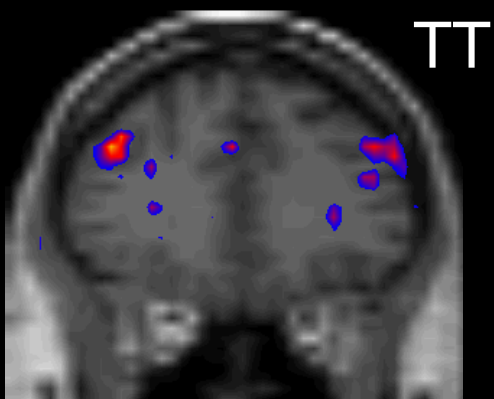
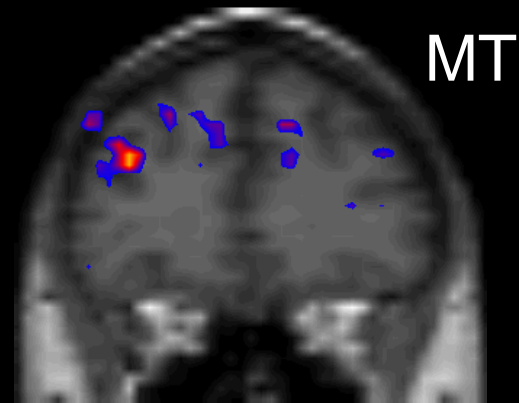
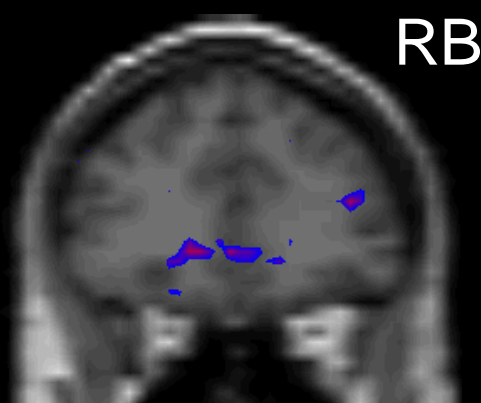
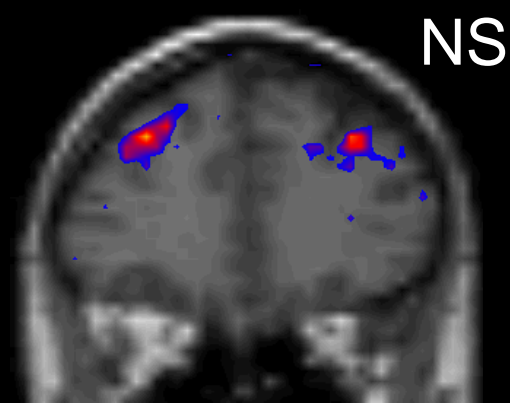


Prefrontal cortex
(what I specialize in)
is over-rated.

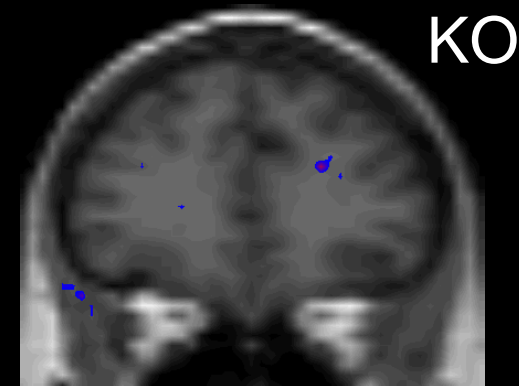
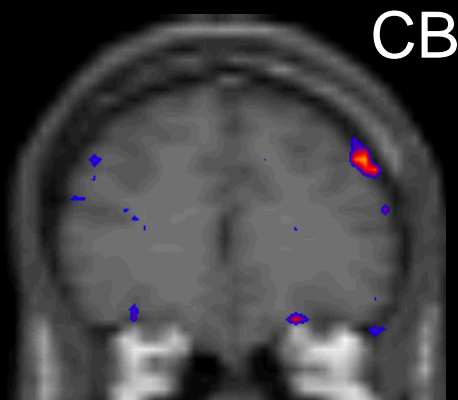
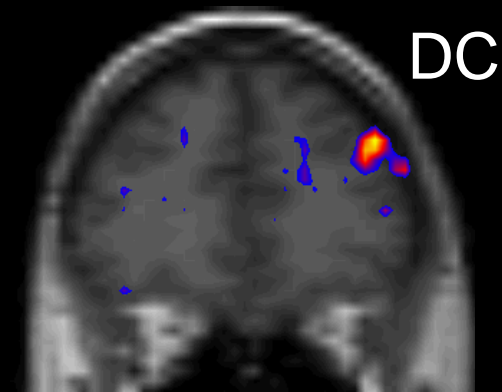
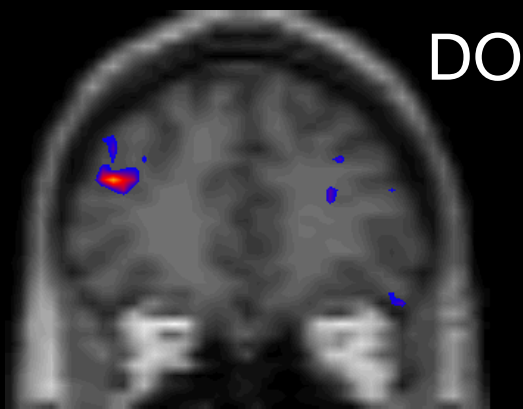


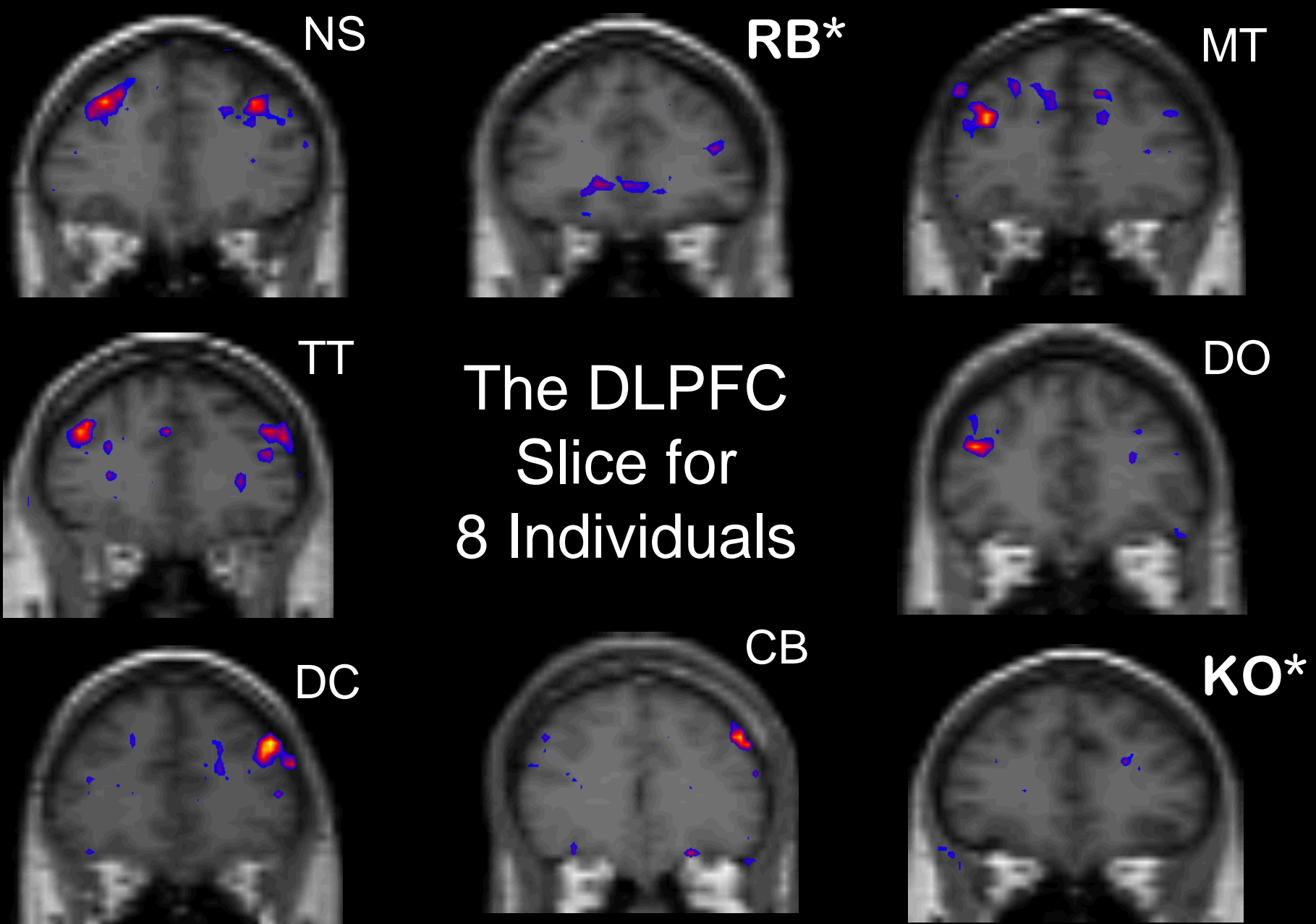
To learn something **new**, we
need prefrontal cortex.

But after something is no longer
new, persons who perform best
recruit prefrontal cortex ***least***.



The DLPFC
Slice for
8 Individuals





* Bergida & O'Craven were collaborators on the study. Because they were familiar with the task, PFC activation dropped out.

Older brain regions have had far longer to perfect their functioning; they can subserve task performance ever so much more efficiently than can prefrontal cortex (PFC).

A child may know intellectually (at the level of PFC) that he should not hit another, but in the heat of the moment if that knowledge has not become automatic (passed on from PFC to subcortical regions) the child will hit another (though if asked, he knows he shouldn't do that).

**The only way something
becomes automatic
(becomes passed off from
PFC) is through action,
repeated action.**

Nothing else will do.



**Preventing problems by getting
children started on a beneficial
trajectory with good behaviors**

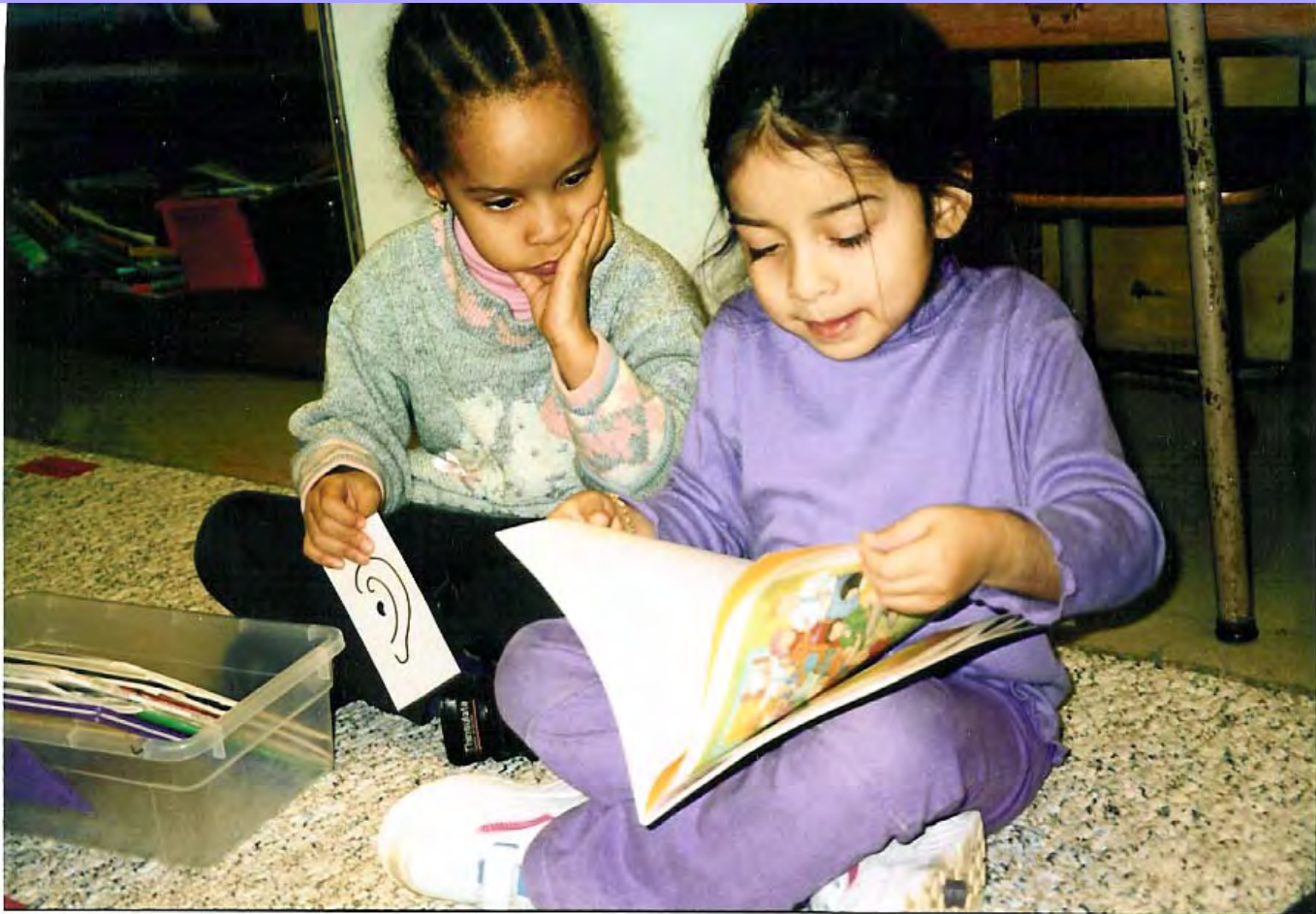
**is far more effective
and far less costly**

**than trying to treat or reverse
problems later once they have
been allowed to develop.**

**How can a young child
practice a skill that he is
not yet capable of
performing?**

The answer: Scaffolds

Scaffolding



Scaffolds, such as the simple line drawings of a mouth and an ear, enable children to practice skills they would not otherwise be able to practice.

If you assume that children can't do something and so structure a class so they don't need to do it, children do not get the benefit of practice to help them improve.

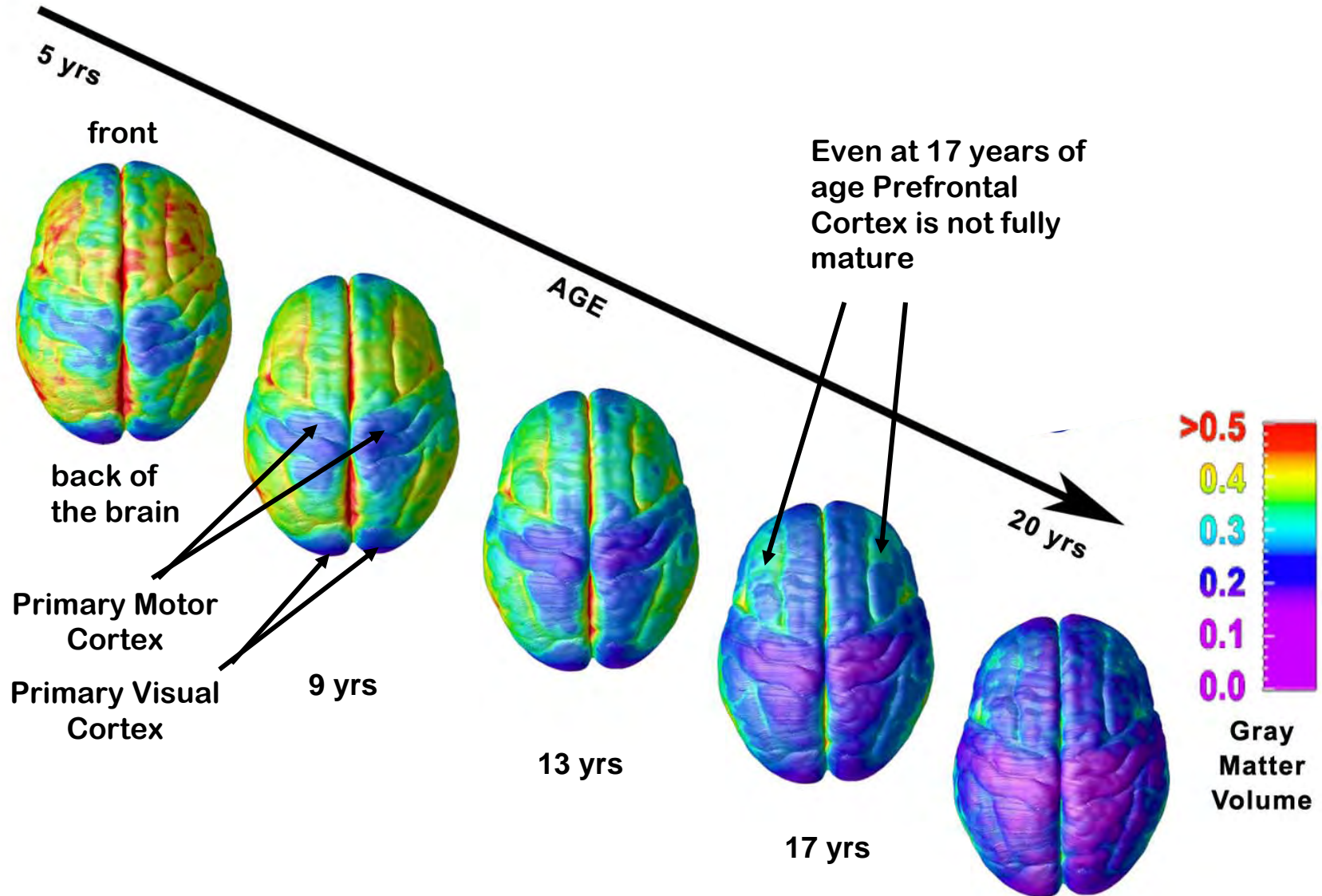
If with the same assumption, you provide scaffolds or supports to help children do these things, then they get practice (and the pride of achievement) and through repeated practice, they improve.

3. It's never too early

And it's never too late

(though often later is harder)

Human Brain Development



Even those who believed that EF can be improved, have doubted whether that could be done as early as preschool since EF depends on PFC, and PFC isn't fully mature until young adulthood.

(Analogy with leg length at 2 years and walking and even running at age 2.)

Just because PFC isn't fully functional, doesn't mean that it isn't functional at all.

Indeed, we have shown that
EF skills can be improved
even in children as young as 4-5 years
without expensive, highly
technical equipment
by regular teachers
in regular classrooms

Environmental Influence on Executive Function Development

Exercise / use / practice can
improve the functioning of a
neural system (cognition) just
as it does muscle function
(motor skills).

Environmental Influence on the Maturation of the Frontal Lobes

Bilingualism appears to help
executive functions develop
earlier and more rapidly.

Kovács AM, Mehler J. (2009)

Cognitive gains in 7-month-old
bilingual infants.

*Proceedings of the National
Academy of Sciences.*

vol 106, p. 6556-6560

**“Brain-based” does NOT mean
immutable or unchangeable.**

**Experience and activity change the
brain.**

**EFs depend on the brain --
but they can be improved
by the proper activities**

Very little is fixed or unchangeable.

90% of our genes are switched off. To a large extent, our experiences, and our reactions to them, determine which genes get turned on (& off), when this happens, & which genes stay on.

Experience also sculpts the brain, and the brain changes throughout life (neuro-plasticity).

**4. The different parts of
the human being are
fundamentally interrelated**

**We are not just intellects,
we have emotions
we have social needs
& we have bodies**

We ignore any one of these at our peril.

I hypothesize that programs that address all of these aspects of the human being (the whole child) will be the most successful at improving any of one them.

**We are not just intellects,
we have emotions
we have social needs
& we have bodies**

Our brains work better
when we are not in a
stressed emotional state.

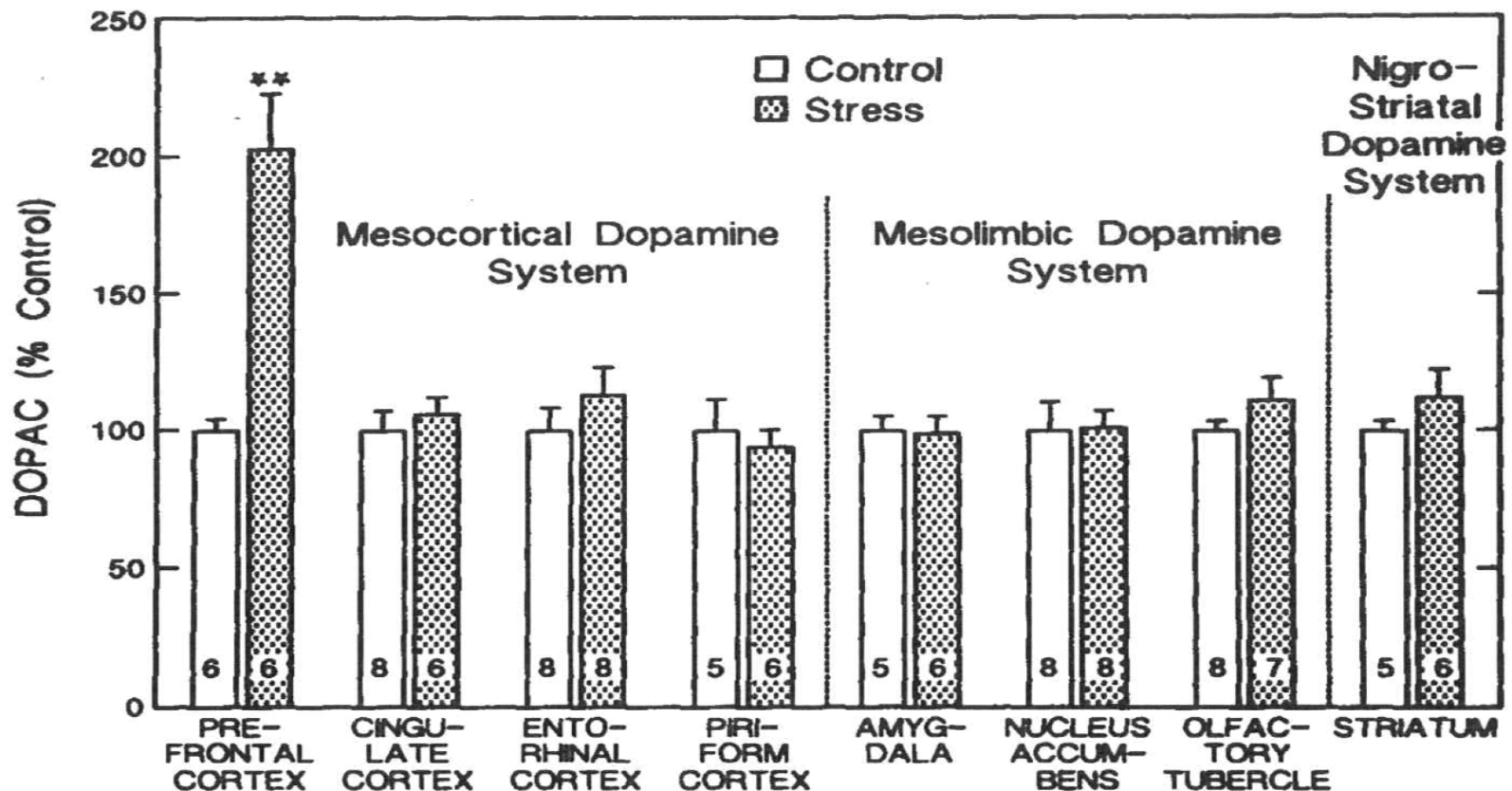
Amy Arnsten
1998, *Science*

This is *particularly* true for PFC & EFs.

**Stress impairs Executive
Functions and can cause
someone to look as if he or
she has an EF impairment.**

Stress and Prefrontal Cortex

Even mild stress increases DA release in PFC but not elsewhere in the brain



(Roth et al., 1988)

**This has obvious implications for
the importance of minimizing the
stress children experience**

**AND for minimizing the stress their
caregivers (their parents and
teachers) experience**

If we want teachers who can care for our children, it is important that teachers also receive caring and support.

CARE for Teachers is a program that trains teachers in techniques such as mindfulness to help them reduce stress, feel calmer, and have a better sense of well-being. This helps teachers become more aware of, and sensitive to, children's needs and more emotionally responsive.

This markedly changes the climate in the classroom. It brings more joy into the classroom and into teachers' lives.

The *Tools of the Mind* early childhood program uses a different strategy to reduce stress.

Because children in *Tools of the Mind* exercise better executive functions (including better self-control), teachers do not have to worry about things getting out of control; they can relax.

Without having to worry about being reprimanded by the teacher for misbehaving, the children can relax.

There is palpably more calm, and more joy, in a *Tools of the Mind* classroom.

JOY is NOT the opposite of **SERIOUS**

**Serious business (like learning) can
be JOYFUL**

**It is NOT true that students can't be
learning if they are having fun.**

Teachers need to provide the opportunities for children to do things that enable the children to believe in themselves: do-able challenges.

Pride and self-confidence come from seeing yourself succeed at something that you know is not easy.

Passionate Enthusiasm ('Ruach')

Engaging students' interests,
imagination, intellect, & passion

PLAY doesn't take away time
from improving academic
outcomes; play helps improve
academic outcomes.

Though not all play is the same!

Second Edition

Tools *of* the Mind

The Vygotskian Approach to Early Childhood Education



● Elena Bodrova & Deborah Leong

Foreword by Michael Cole

The Tools of the
Mind early
childhood
program, based
on theories of
Vygotsky and
Luria



Vygotsky: Engaging in social pretend play is critical for developing executive function skills in very young children. It is emphasized in *Tools of the Mind*.



- During social pretend play, children must hold their own role and those of others in mind (working memory)
 - inhibit acting out of character (employ inhibitory control), and
 - flexibly adjust to twists and turns in the evolving plot (cognitive flexibility)
- all three of the core executive functions thus get exercise.



Deb and Elena tried EF activities as a module, added onto a curriculum.

They found that children improved on what they practiced in the module, but the benefits did not transfer to other contexts or other EF skills.



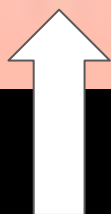
They found that for benefits to generalize to other contexts and other EF skills, supports for, training in, and challenges to EF needed to be embedded in all aspects of the school day.

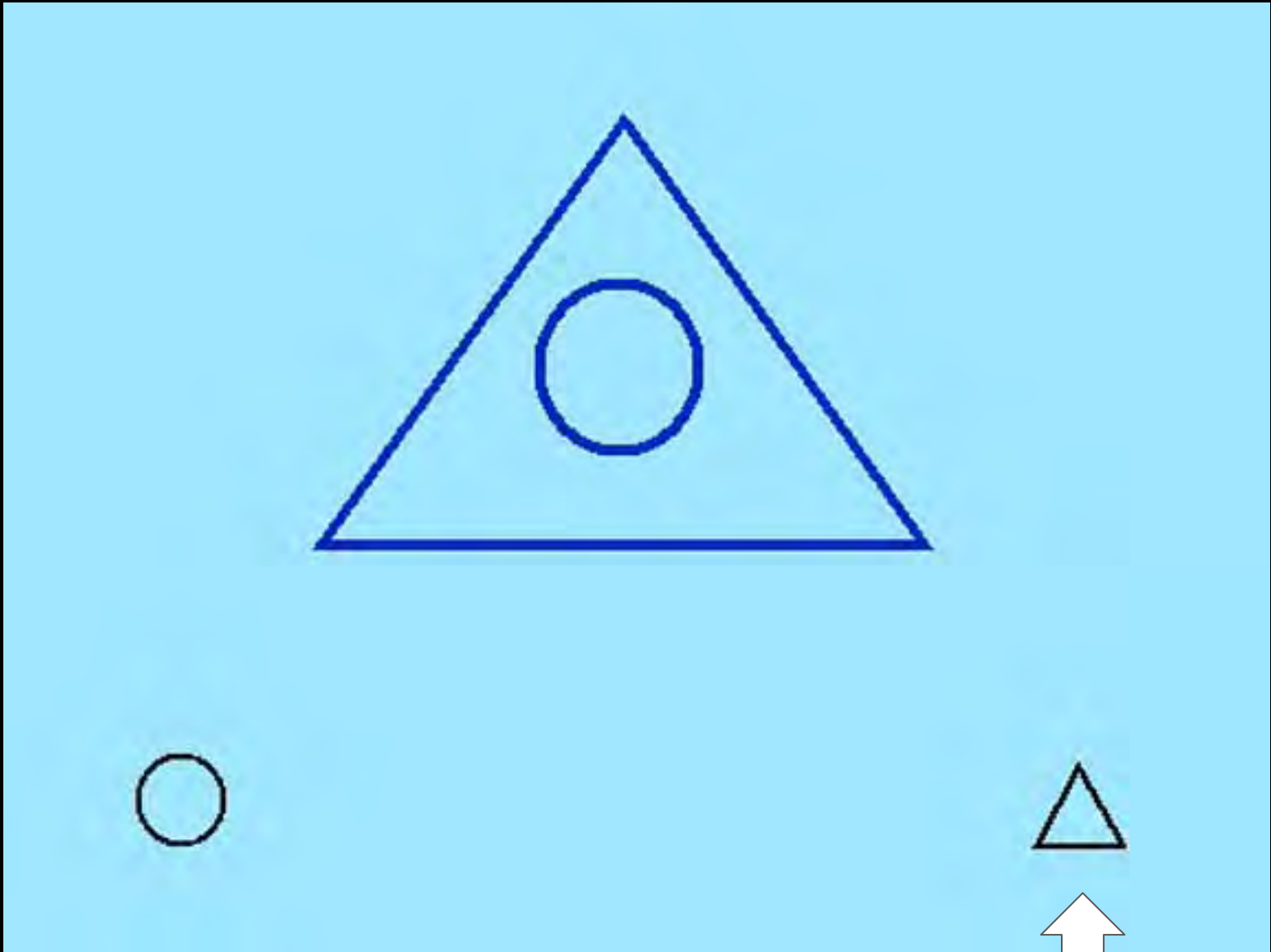


In evaluating *Tools* we specifically chose EF measures completely different from anything any of the children had ever done before.

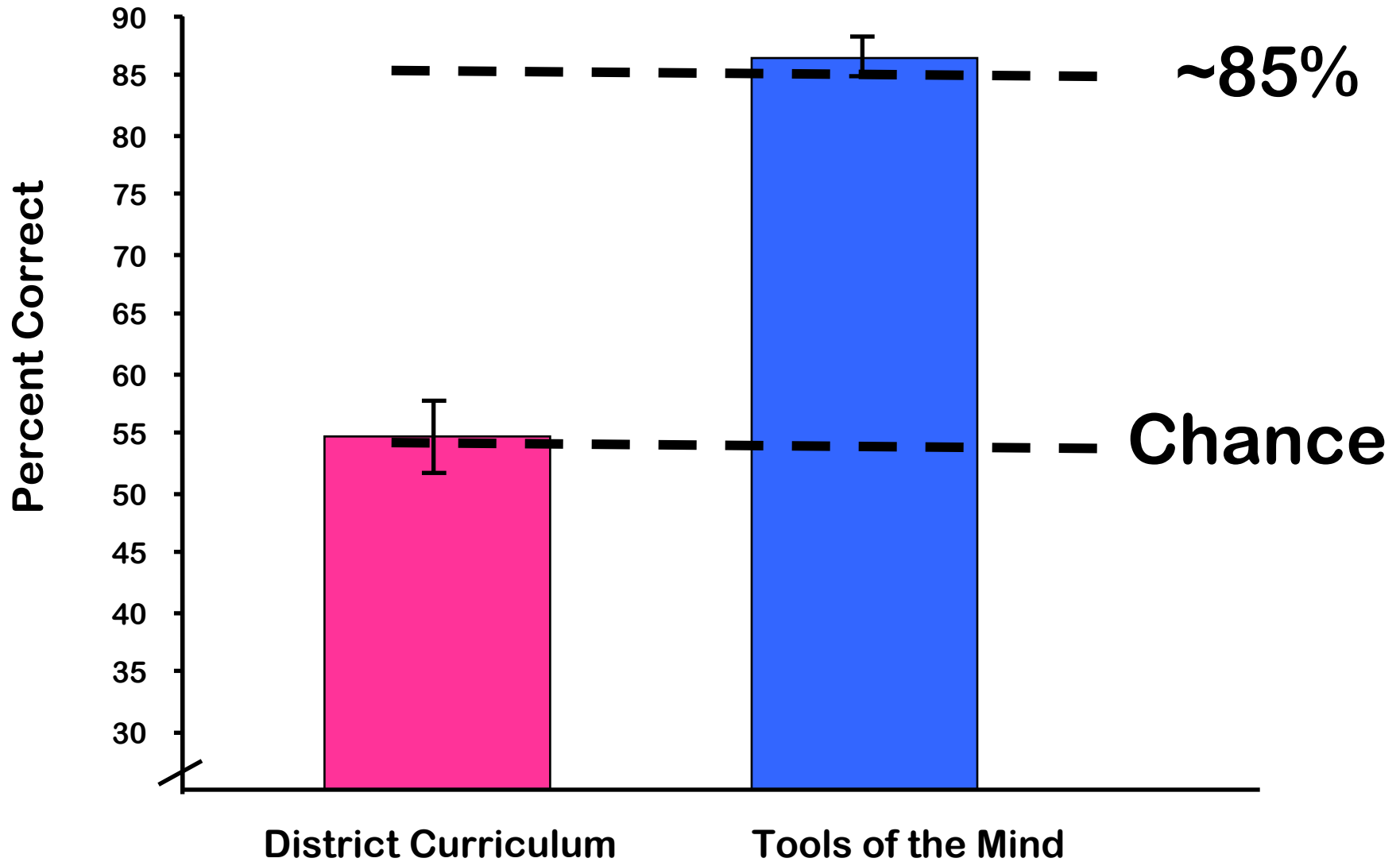
To see a difference by condition, the children would have to TRANSFER their training in EF to utterly new situations.







Percentage of Correct Responses on Reverse Flanker Trials





November 30, 2007

THE EARLY YEARS

Preschool Program Improves Cognitive Control (Executive Functions)

Adele Diamond,^{1*} W. Steven Barnett,² Jessica Thomas,² Sarah Munro¹

Superior academic performance in children who have been through Tools has been replicated in other Tools of the Mind programs with other children and other teachers, in other schools and states, and with different comparison conditions.



**We are not just intellects,
we have emotions
we have social needs
& we have bodies**

Our brains work better when we are not feeling lonely or socially isolated.

*Loneliness: Human Nature and
the Need for Social Connection
2008*

a book by John Cacioppo & William Patrick

This is *particularly* true for PFC & EFs.

Roy Baumeister et al. (2002, *Journal of Personality and Social Psychology*)

- One group of subjects were told beforehand they'd have close relationships throughout their lives;
- another group was told the opposite;
- a third group was told unrelated bad news.

On simple memorization questions, the groups were comparable.

On sections involving logical reasoning (EF), subjects told they'd be lonely performed much worse.

A later study by a separate research group found that during math tests there was less activity in Prefrontal Cortex among participants who felt isolated.

**We are not just intellects,
we have emotions
we have social needs
& we have bodies**

Our brains work better when our bodies are physically fit.

Nature Reviews Neuroscience (January 2008)

“Be Smart, Exercise Your Heart:
Exercise Effects on Brain and Cognition”

Charles Hillman, Kirk Erickson & Art Kramer

“There is little doubt that leading a sedentary life is bad for our cognitive health.”

This is *particularly* true for PFC & EFs.

**Motor development and
cognitive development seem
be fundamentally intertwined.**

Diamond, A. (2000)

Close interrelation of
motor development and cognitive development
and of the cerebellum and prefrontal cortex.

Child Development, 71, 44-56

one example:

Budde et al. 2008: among 13-16 year-olds randomly assigned to physical exercise or a control group, those in the exercise group improved more in selective attention & concentration.

For 10's of 1,000's of years, across *all* cultures, storytelling, dance, and play have been part of the human condition.

People in *all* cultures told stories and passed down information by word of mouth, made music, sang, danced, and played. There are good reasons why those activities sprang up everywhere and have withstood the test of time.

Music-making, singing, dancing, and playing address our physical, cognitive, emotional, and social needs.

These activities

- challenge our executive functions,
- make us happy & proud,
- address our social needs,
- & help our bodies develop

HARD WORK, PERSISTENCE, DISCIPLINE

practice, practice, practice

HIGH STANDARDS – challenge the children

COGNITIVELY DEMANDING – challenge concentration,
sustained attention, working memory (remember
complicated sequences)

COGNITIVE

**PHYSICAL ACTIVITY, INTENSIVE MOVEMENT &
VISUOMOTOR TRAINING**

PHYSICAL

SELF-CONFIDENCE, PRIDE

JOY, PASSION – engage & motivate

EMOTION

SOCIAL SUPPORT, SOCIAL BELONGING – part of a group
(an ensemble of dancers or musicians) – children help
one another, listen to one other, & respect one another.
Each is an important part of the whole.

SOCIAL

**The ARTS, PLAY, and PHYSICAL
ACTIVITY (perhaps especially
YOGA) may be CRITICAL for
achieving the ACADEMIC
outcomes society wants.**

SERVICE ACTIVITIES

activities where one is working to help one's community or people further afield

These are acts of caring and generosity, but they also require forethought and planning, perseverance even in the face of initial setbacks, creativity and flexibility when unexpected obstacles or opportunities arise, and putting into use what one has learned in school.

One is a member of a group working toward an important shared goal.

Margaret Nkrumah (daughter-in-law of Ghana's first Pres.):

“In many of [our] schools we found that our own SOS children [abandoned / abused / orphaned children] from the SOS Children's Villages performed poorly compared to their classmates as they appeared unable to overcome their history of abandonment, trauma or abuse, poverty and previously inadequate care, even though they now lived in a nurturing environment in our SOS Children's Villages. The SOS President believed that it was possible to reverse this trend...Twenty years later, we have graduated over a 1000 students both SOS and non-SOS who have since studied in all the best universities.

“What [we] sought to achieve was for the students to know that they have a mission beyond academic success and that their talents and skills could serve both Africa and the wider world; the service element of our programme was a key element in this process.

All students committed themselves to community service projects on a weekly basis.

This commitment continues after school and university and there are many projects begun by our alumni.

Perhaps this is also [a] way to tap into the idealism and activism that youth thrives on -- they seem to benefit from the sheer happiness of giving something back to society...and I think they need to be given the opportunity for that kind of self-growth.”

Children need to work alongside others from different ethnic groups to achieve a common goal -- a goal they are excited about.

Can even have a yearly competition for service project ideas, with all the children voting on which one they want to undertake



Emile Durkheim: *Suicide*

Egoistic Suicide -

individual ego asserts itself excessively

When we have no other object than ourselves, we can't avoid the thought that our efforts will finally end in nothingness, since we ourselves will disappear.

Individuals feel apathy, depression. feel nothing is worth doing. life is empty.

to prevent or remedy this:

need a cause bigger than oneself
(such as a SERVICE PROJECT)

Life is intolerable unless there is some reason for existing, some purpose justifying life's trials.

Anomic Suicide

in times of change (e.g., upward mobility), reference points become indeterminate; people become unrealistic about potentialities.

People need limits; the more one has, the more one wants.

Material satisfactions only stimulate needs, rather than fulfilling them. The less limited one feels, the more intolerable all limitation appears

People need to know how much they can expect to achieve

We're happy when our needs are in line with means, and miserable when pursuing unattainable goals. We would never consent to restricting our desires if they felt justified in not limiting them.

In societies where man is subjected to a healthy discipline, he submits more readily to the blows of chance.

Poverty forces us to constant self-discipline.

Wealth, by the power it bestows, deceives us into believing that we depend on ourselves alone.

5. Children learn what they live

a) Teacher's humanity

A teacher's humanity is more important than the teacher's knowledge or skill.

Results of a poll by the British Medical Journal:

The majority of respondents said:

“A good doctor, is first and foremost, a good human being.”

Jerome Frank conducted a study comparing several different forms of psychotherapy to one another.

He concluded:

“A totally untrained therapist who exercises a great capacity to love will achieve psychotherapeutic results equal to the best.”

The most basic and powerful way to communicate to our students that we care about them is to listen to them. Truly listen.

Give them our time and our attention.

The quality of our listening, rather than the wisdom of our words, is often what has the most impact.

“Children who are truly loved...know themselves to be valued. This knowledge is worth more than any gold.

“The principal form that love takes is giving of your time, and truly listening. When something is of value to us we spend time with it. When we love our children, we give them our time.... True listening, total concentration on the other, is always a manifestation of love.

“Your willingness to listen is the best possible concrete evidence of your esteem that you can give your child. There is no better and ultimately no other way to teach your children that they are valuable people than by valuing them.

When children know that they are valued... they feel valuable....This feeling of being valuable is the cornerstone of discipline because when one considers oneself valuable one will take care of oneself in all ways that are necessary. Self-discipline is self-caring.”

-- Scott Peck, *The Road Less Traveled*

5. Children learn what they live

b) Teacher as Role Model

If we preach kindness but do not practice it, our words will have little effect.

We should model accepting that we may be part of the problem:

When a child is not grasping a concept or new skill, we often blame the child: “If only the child were brighter, she would have grasped what I’m trying to teach.”

It is critical that we never forget our own role in the learning process and that different people learn in different ways. If a child isn't getting something:

What might I, the teacher, do differently? How can I present the material differently, or word the question differently, so that this child can succeed?

5. Children learn what they live

b) Teacher as Role Model

If we preach tolerance, but practice prejudice, our words will have little effect.

A wonderful Indian psychologist, Mahzarin Banaji,
Richard Clarke Cabot Professor of Social Ethics at
Harvard University

focuses on ways in which prejudices toward social groups can be expressed without conscious awareness or intent. Her research addresses how well-intentioned people can behave in ways contrary to their expressed wishes and conscious intent.

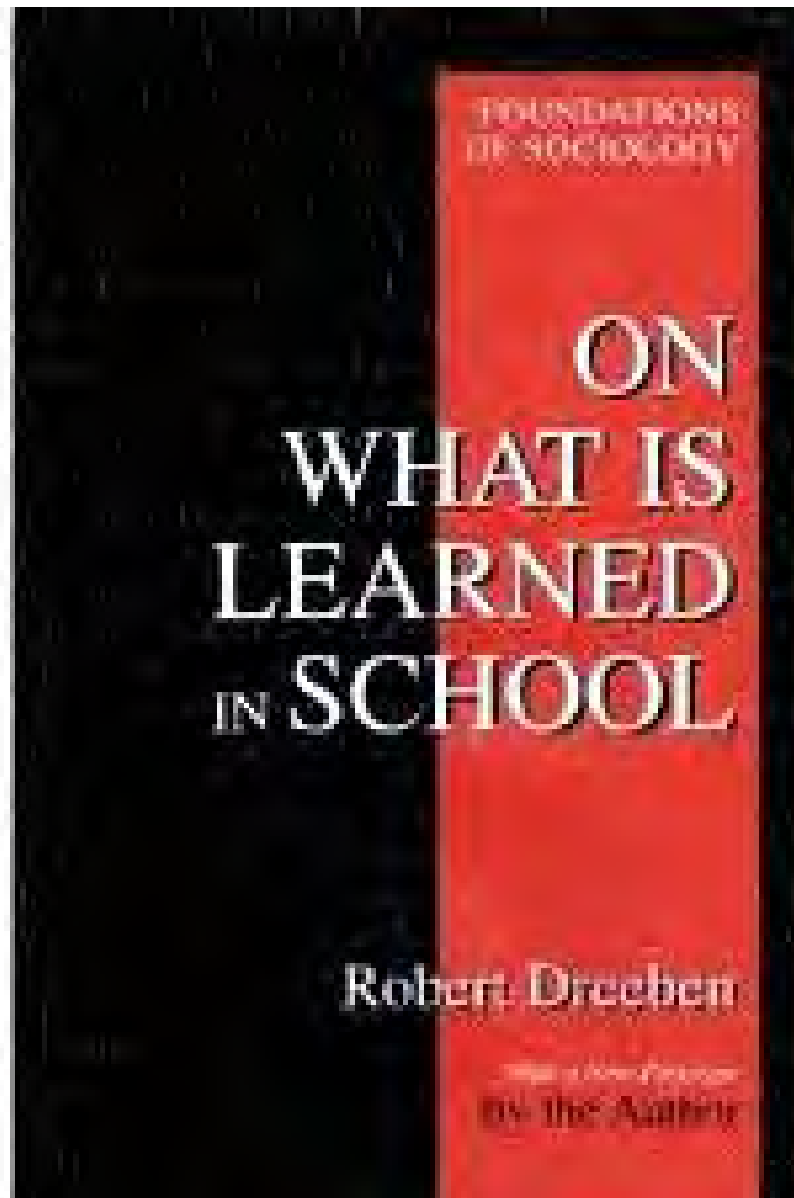
Her research has shown that...

- Implicit biases are pervasive, predict behavior, and are held even by well-meaning people
- Implicit biases are learned and therefore can be unlearned. They can be changed!
- Implicit biases are not amenable to change from simply willing them away, but they are quite malleable through appropriate interventions.

IAT: Implicit Attitudes Test

5. Children learn what they live

c) The importance of the way schooling is structured



first published in 1968

yearly promotion to a new teacher
serially establishing & severing relations with adults

students progress through school in batches by age
like manufactured parts, not like unique individuals

do your work alone; no looking at another's answers
not learning to work collaboratively

5. Children learn what they live

d) They see what gets rewarded

They see what their community values

Children see who people look up to.
They see who gets praised and held
up as role models.

If we want children to grow up to be
compassionate and civic-minded,
they need to see concretely that that
is valued.

We give awards for the Best Scholar and the Best Athlete, but too rarely for the Most Selfless Student.

They see teachers getting evaluated by the academic test scores of their students, not by the humanity or kindness of their students.

We need to regularly recognize students for doing good deeds, for taking the initiative to help at a local or global level. We need to regularly recognize school personnel

(*all* school personnel, including the janitor, cook, librarian, etc.) for best personifying the human values we hope our students will adopt.

It is not that one should do the right thing *in order* to get a reward, or that every good deed should get rewarded, but students should see very concretely that it is at least as important to be a good person as it is to be bright or athletic.

The School Curriculum can and should provide role models

Besides reading about Hitler and Pol Pot, in both history and literature students should read about people we might want them to emulate; they should read about how small things can make a big difference. Possible examples:

Remarkable individuals, such as

Nelson Mandela

Václav Havel

Martin Luther King

Dr. Paul Farmer (working in Haiti)

Greg Mortenson (Three Cups of Tea)

Sabriye Tenberken (Braille without Borders)

Individuals who have triumphed over hate

Nelson Mandela

Dr. Izzeldin Abudelaish (Palestinian doctor)

Individuals who have triumphed against great odds

Sabriye Tenberken (blind)

Manny Pacquiao (very poor Filipino child)

Small Acts making BIG Differences

The Courage to Care (simple folk who helped Jews in WWII)

Seedfolks (a young girl plants bean seeds)

Pay It Forward

Individuals who have come up with, and implemented,
great ideas to help people

Dr. Gilles Julien (Social Pediatrics)

Muhammad Yunus (micro-finance, Grameen Bank)

Bunker Roy (Barefoot College)

6. The Importance of Attitudes

Appreciate the role of LUCK.

I work hard, but others might not look favorably on my work or my experiments, though exceedingly well planned, might come up with null results.

Everything I have achieved is a gift.

It is not that I would have received the gifts had I not worked hard, but my efforts could easily not have borne fruit.

That they bore fruit is a gift for which I am deeply grateful.

Arrogance, pride, & condescension are
absolutely unwarranted.

GRATITUDE

Each of us is lucky in so many ways....

...that when we got sick, we got better.

...that when we fell, we did not hurt ourselves more.

...that when we weren't looking and stepped off the curb, a car didn't hit us

...that others have forgiven our slips of word or deed.

...that when we were down and out, someone showed us kindness.

...that when we made something, the pieces fit together.

...to have seen so much in our lives, even if we never moved.

...that there was water for a shower

...that when we thought we could not go on any further, we found the strength to continue.

Remembering the many things we have to be grateful for, makes it less likely we will feel deprived or envious.

Students should write down each day the nice things that others have done for them or other things they are grateful for.

In the beginning the teacher may need to help students remember things to write down here.

Remember that mean, hurtful behavior often comes from hurt, sometimes very deep, grievous hurt.

Early hurt brings the expectation of future hurt, and so the child hardens himself and decides to push others away before they have a chance to push him away.

He now appears to be absolutely awful, but that is not coming from being a bad person, but from having been so very deeply hurt himself.

To Recap the Main Points

1. There is no better way to learn than by **doing**, by experiencing for oneself.
2. The importance of repeated **practice**.
If students act as if they are good, they will become good.
The only way something becomes automatic (becomes passed off from PFC) is through action, repeated action. Nothing else will do.
- 2b. **Scaffolds** can help someone practice a skill that he or she could not perform unaided.
3. It's **never too early**, and **never too late** (though later is often harder).
“Brain-based” does NOT mean immutable or unchangeable.

4. The different parts of the human being are fundamentally interrelated. Each part (cognitive, spiritual, social, emotional, & physical) develops best when no part is neglected. (Importance of play, the arts, & service activities.)
5. Children learn what they live
 - a) Teacher's humanity; b) Teacher as Role Model,
 - c) Importance of the way schooling is structured,
 - d) Children see what the community values.
6. The Importance of attitudes and one's perspective

*Thank you so much
for your attention*

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