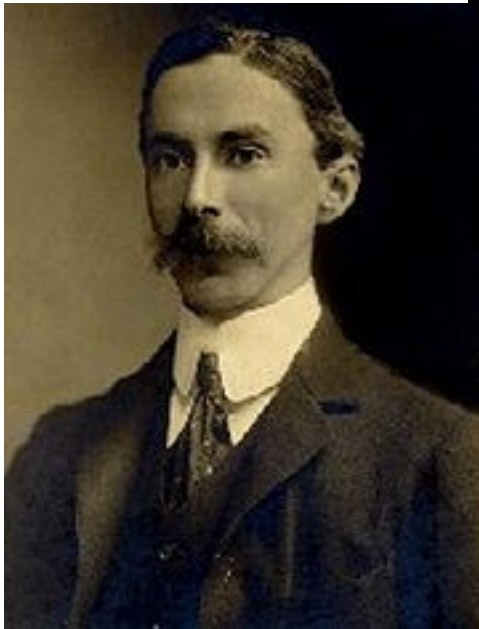


**“In all affairs it's
a healthy thing
now and then
to hang a
question mark
on the things
you have
long taken
for granted.”**



**Bertrand Russell
(1872-1970)**

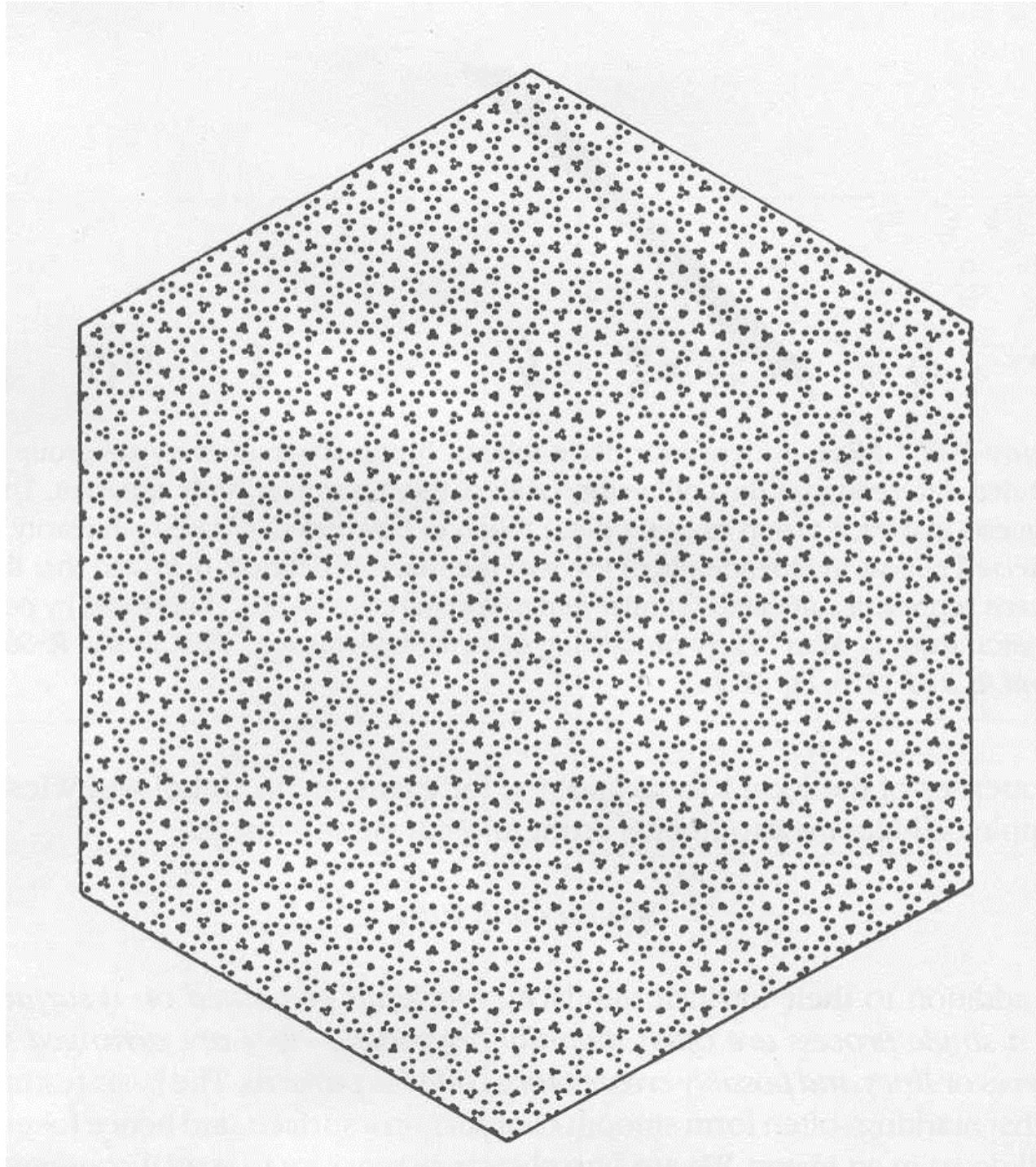




**Languages and math/sciences as vectors for civic education:
preparing our children to live in a globalized world**

**Eurydice Slovenia Conference
on science and mathematic education
Kongresni Center Brdo, Slovenija, 11-12.12.12**

**Bruno della Chiesa
Harvard Graduate School of Education**



From:
Marroquin, J.L.
(1976)
*Human Visual
Perception of
Structure,*
Masters degree
thesis,
MIT Dept. of
Electrical
Engineering &
Computer
Science

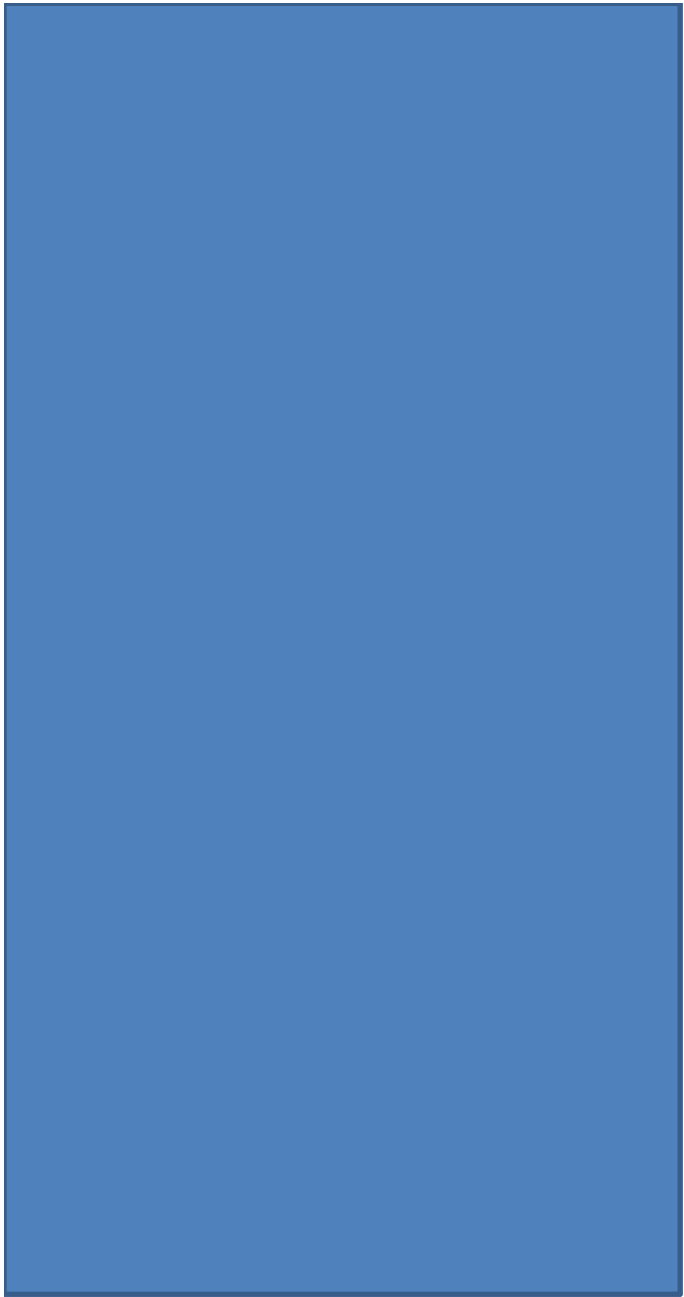


Understanding is seeing patterns...

- **The 'eureka!' experience: learning is extremely pleasurable...
...even at school!**
- **Pattern recognition makes you feel secure...**

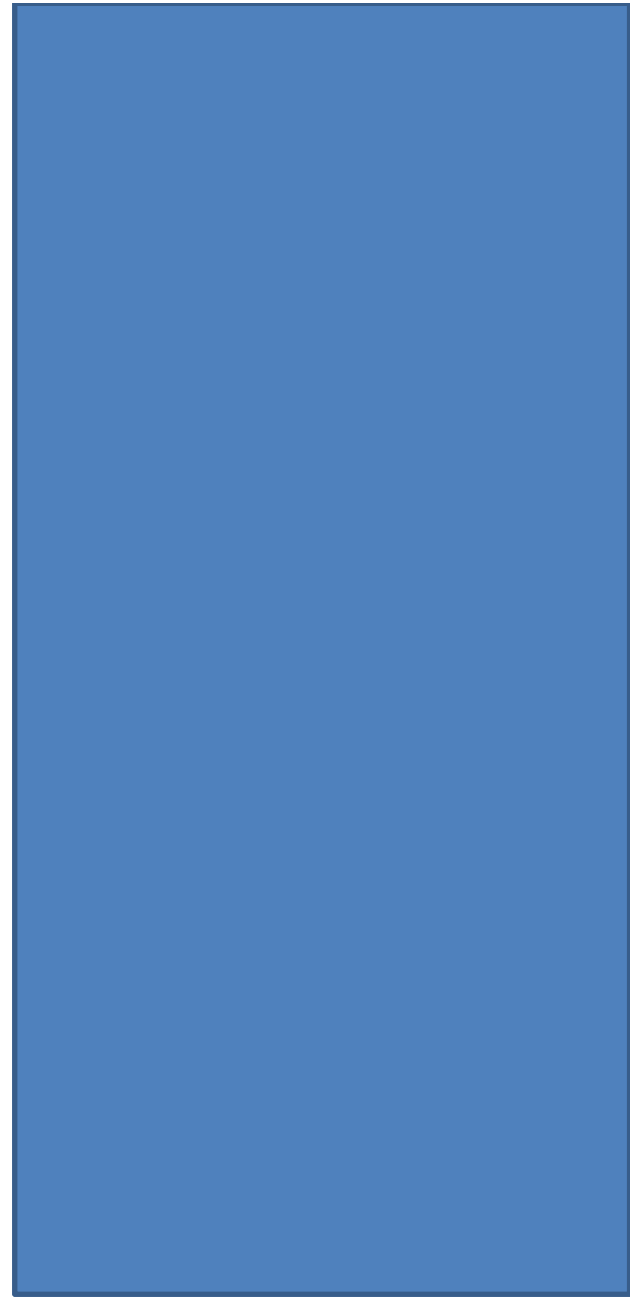
...but 'seeing patterns' can be misleading

- **Matching with previously known patterns can lead to problems**



B

B



Categorical perception (from Gärdenfors, 2007)

A

B

C

12

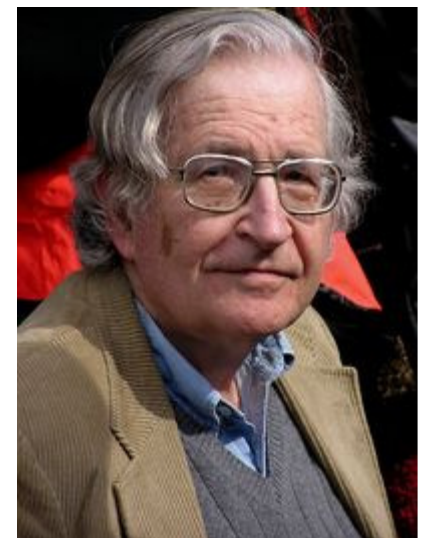
13

14

Categorical perception (from Gärdenfors, 2006)

“For us, we are all very different; our languages are very different, and our societies are very different. But if we could extract ourselves from our point of view and sort of look down at human life the way a biologist looks at other organisms, I think we could see it a different way. Imagine an extra-human observer looking at us. Such an extra-human observer would be struck precisely by the uniformity of human languages, by the very slight variation from one language to another, and by the remarkable respects in which all languages are the same.”

Noam Chomsky (born 1928)

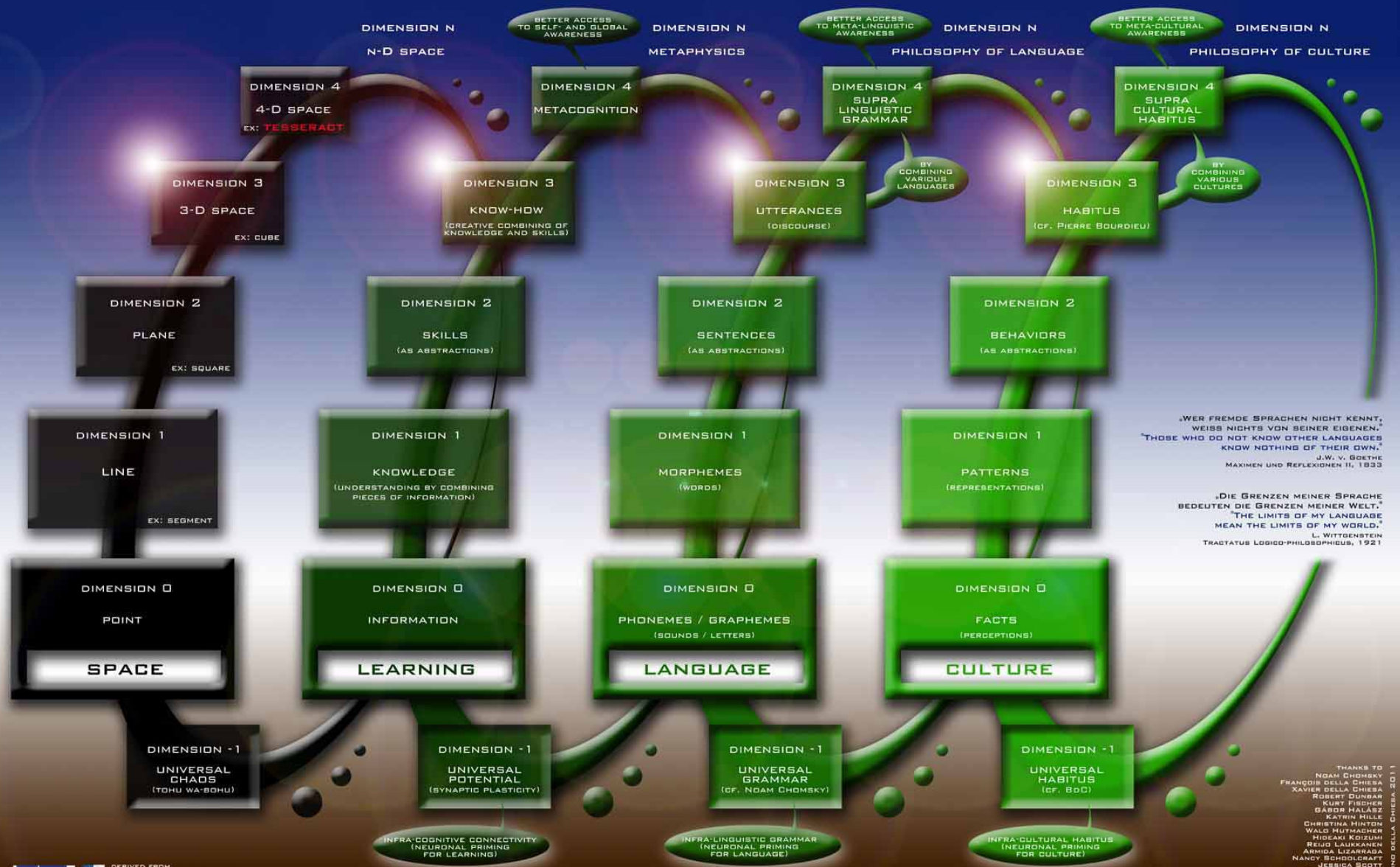


IN SEARCH OF TESSERACTS IN THE BRAIN

„WER FREMDE SPRACHEN NICHT KENNT,
WEISS NICHTS VON SEINER EIGENEN.“
“THOSE WHO DO NOT KNOW OTHER LANGUAGES
KNOW NOTHING OF THEIR OWN.”
J.W. V. GOETHE
MAXIMEN UND REFLEXIONEN II, 1833

„DIE GRENZEN MEINER SPRACHE
BEDEUTEN DIE GRENZEN MEINER WELT.“
“THE LIMITS OF MY LANGUAGE
MEAN THE LIMITS OF MY WORLD.”
L. WITTGENSTEIN
TRACTATUS LOGICO-PHILOSOPHICUS, 1921

IN SEARCH OF TESSERACTS IN THE BRAIN



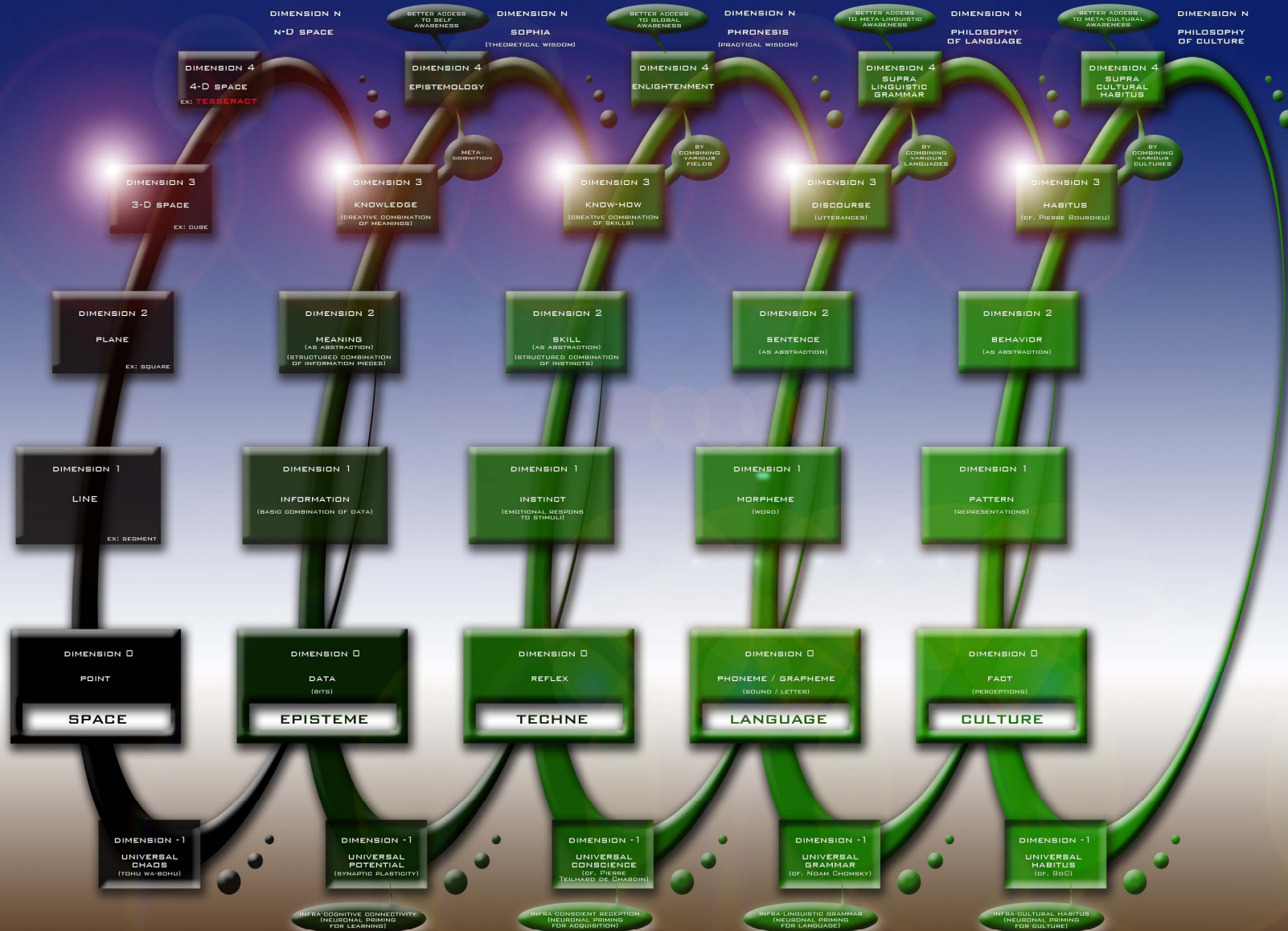


From Bourdieu's kitchen, crucial notion of...

... 'DOXA':

...or 'culture' considered 'nature'...

IN SEARCH OF TESSERACTS IN THE BRAIN



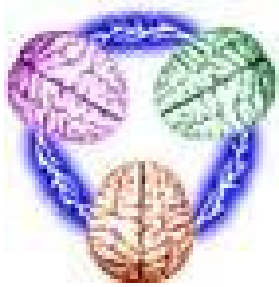
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THANKS TO

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VANESSA CHRISTOPHER
EDWARD CLAPP
JESSE CRUICKSHANK
FRANCIS DELLA CHIESA
ROBERT DUNBAR
KURT FISCHER
PETER GARDENFORS
HOWARD GARDNER
KATRIN HILLE
CHRISTINA HINTON
HIDEAKI KOZUMI
REIJO LAUKKANEN
ARMIDA LIZARRAGA
CYRUS ROBIN
NANDY SCHODOLGRAFT
JESSICA SCOTT
JEFFREY SIEGEL
TZVETAN TODDROV

A NOD AND A WINK TO EDWIN A. ABBOTT
BEAR HUGS TO XAVIER DELLA CHIESA FOR THE INSIGHTS
TO PIERRE BOURDIEU, IN MEMORIAM

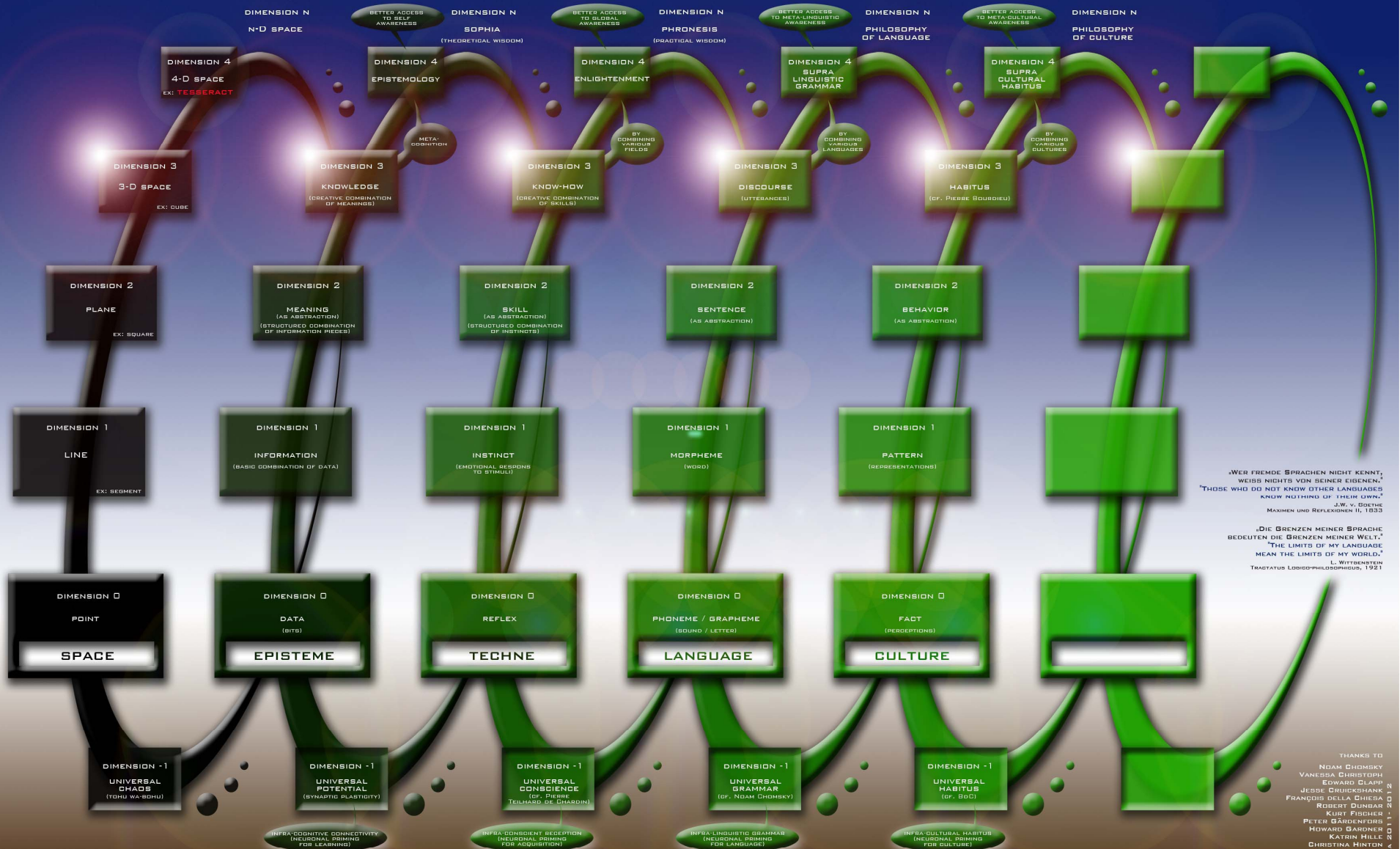


Do we really want to...

- **Promote equity (in education systems, to begin with)?**
- **Fight against 'failure' in our schools?**

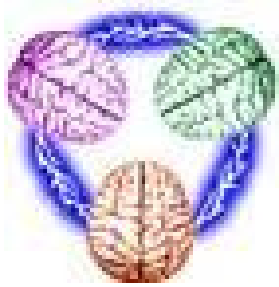
Do we *really* want this ?

IN SEARCH OF TESSERACTS IN THE BRAIN



DERIVED AND EXPANDED FROM
 BRUNO DELLA CHIESA (2010)
 "WANTED: TESSERACT" - ONE HYPOTHESIS ON LANGUAGES, CULTURES, AND ETHICS FOR MIND, BRAIN AND EDUCATION"
 (MIND, BRAIN AND EDUCATION, 4(3), SEPTEMBER 2010, NEW YORK: BLACKWELL PUBLISHING, 135-148)

THANKS TO
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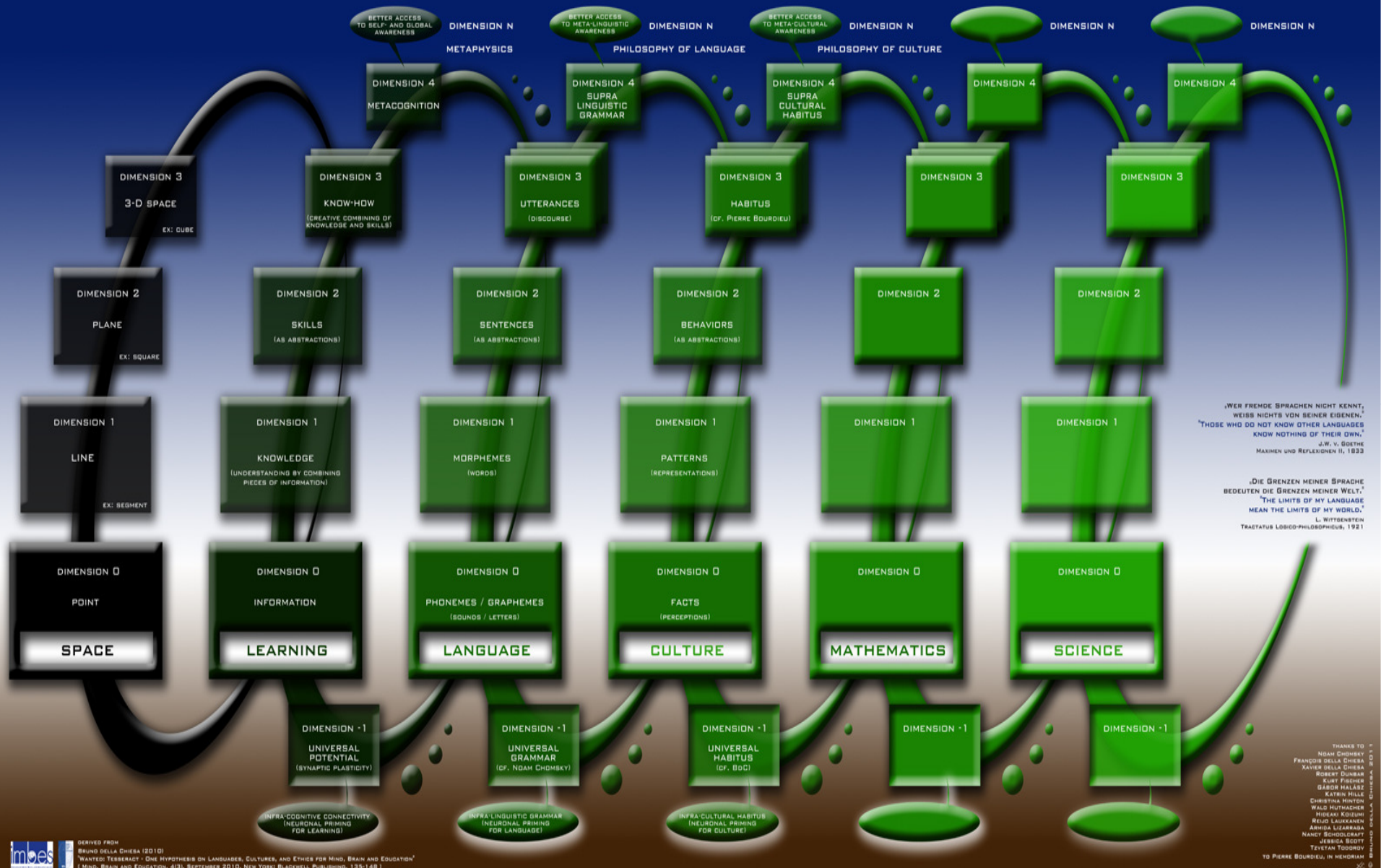


Do we really want our kids to...

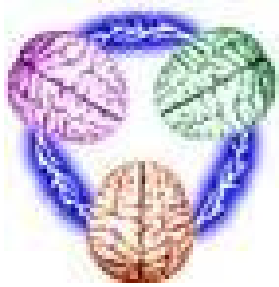
- **...‘think out of the box’?**
- **...develop empathy and tolerance?**
- **...display high ethical standards?**

Do we *really* want this ?

IN SEARCH OF TESSERACTS IN THE BRAIN



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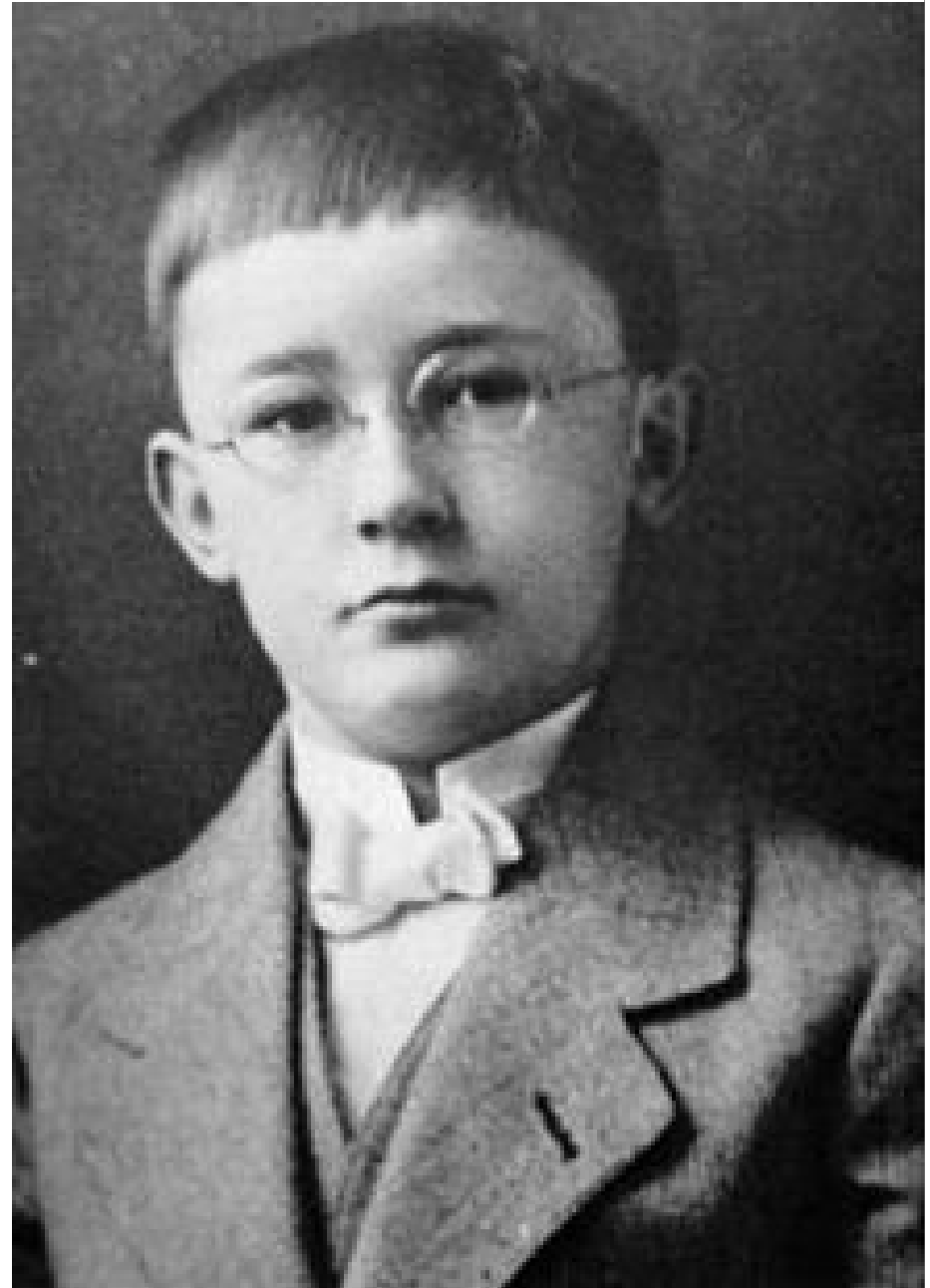


What about ethics?

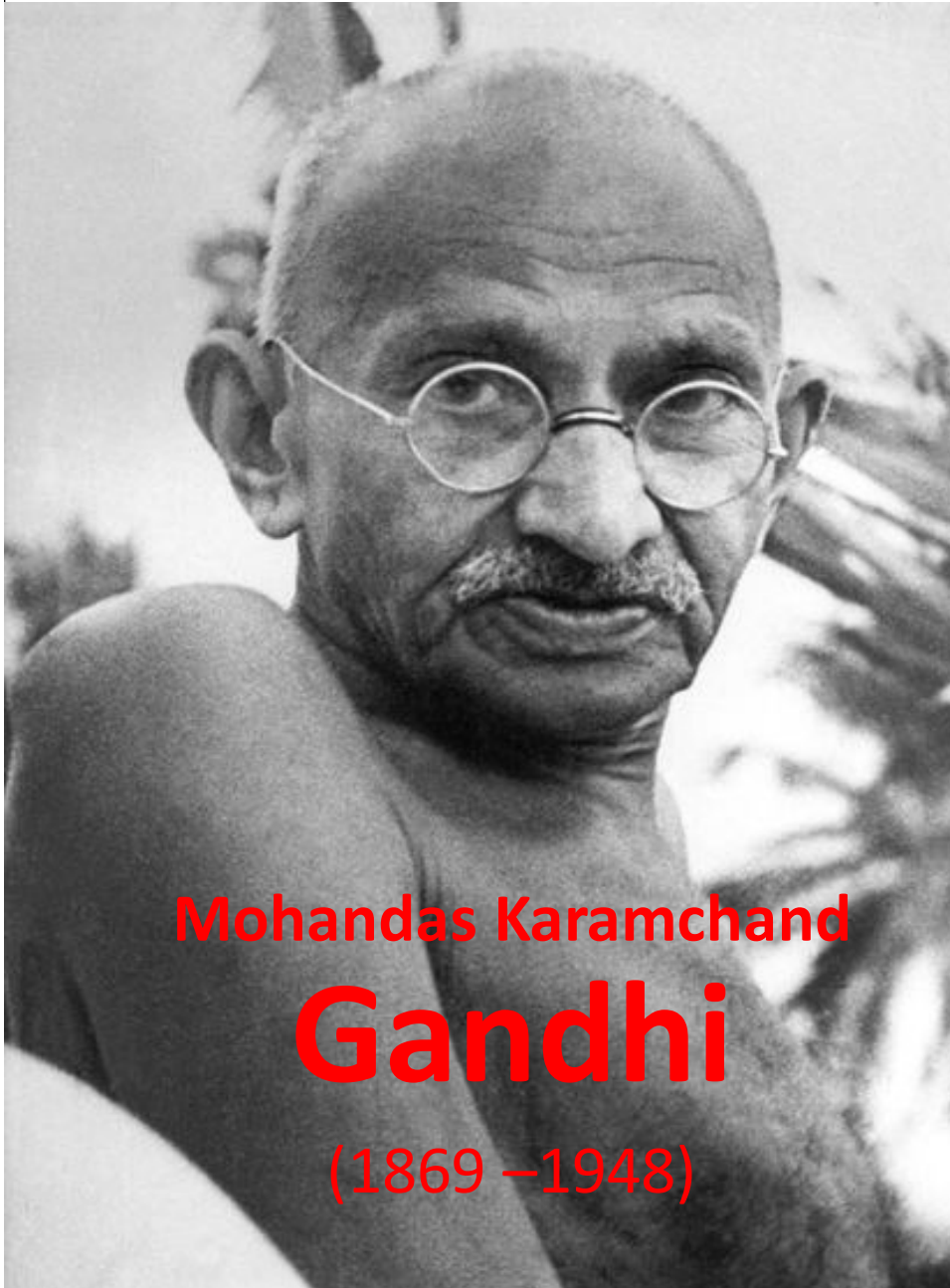
- **How do we form ethical judgments?**
- **How do we make ethical decisions?**
- **We are not far from stunning discoveries on...**

Ethics in the brain

TWO KIDS: ETHICS IN THE BRAIN, NATURE, NURTURE, OR BOTH?



TWO INDIVIDUALS AT THE EXTREMES OF AN ETHICAL SCALE





Questions...

- Are human beings *born unequal* when it comes to ethics?
- Or are ethical standards *acquired*?
- Or both: nature *and* nurture?
(genetics vs. socialization?)



Biological mechanisms of ethics soon discovered in the brain?!

- **if yes, it might (will?) dramatically modify:**
 - ✓ **our philosophical and political views**
 - ✓ **our conceptions of education**
 - ✓ **...and even the ways we perceive ourselves as a species**
- **there is no such thing as a “neutral” science (or technology)**
 - **perceptions, representations, values, prejudices, ideologies...**
(remember Trofim Lysenko; cf. della Chiesa, 1989).



Where do differences come from?

3 options:

1. It is “nature” (genetics: we are pre-programmed by our genes);
2. It is “nurture” (acquired: through environment, particularly education); or
3. It is a combination of both (probable majority for this on experts' side; cf. Dynamic Skill Theory's bio-psycho-social model of human development - Fischer & Bidell, 2006)

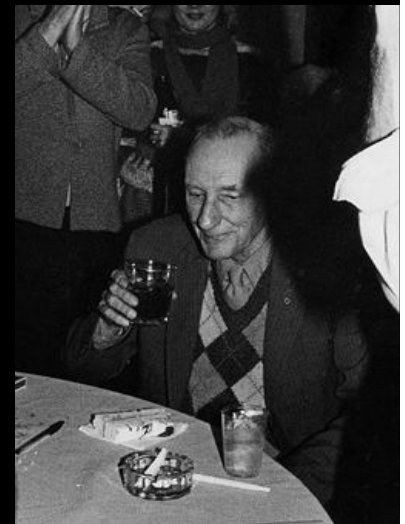
- 3rd explanation probably not to please the media: too complex/complicated
(Scylla or Charybdis...)
- 2 first ones simple (univocal), easy to understand and to convey
- Mass media not equipped to deal with complexity (scientific or not)...
(cf. Bourdieu, 1996; Chomsky, 1989; della Chiesa, 1989, 1993, 2008)

The hardest challenge for our (democratic) societies in the 21st century?

After one
look
at this planet
any visitor
from
outer space
would say:
"I want to
see
the
manager!"

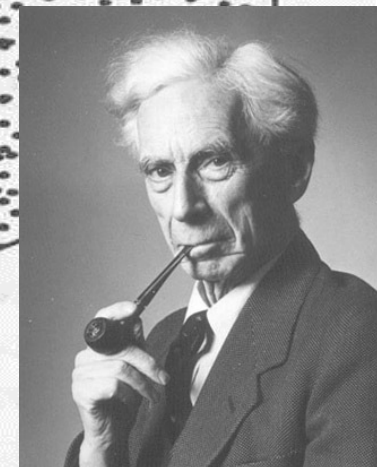


**William S.
Burroughs
(1914-1997)**



**I shouldn't wish people
dogmatically to believe
any philosophy,
not even mine.**

Bertrand Russell
(1872-1970)





bruno_della_chiesa@gse.harvard.edu

A photograph of a group of people in a meeting, with a red text overlay that reads "LET'S BRAIN-STORM!". The background is a blurred image of a group of people sitting around a table in a meeting room. The text is written in a bold, red, sans-serif font and is rotated diagonally across the image.

LET'S BRAIN-STORM!