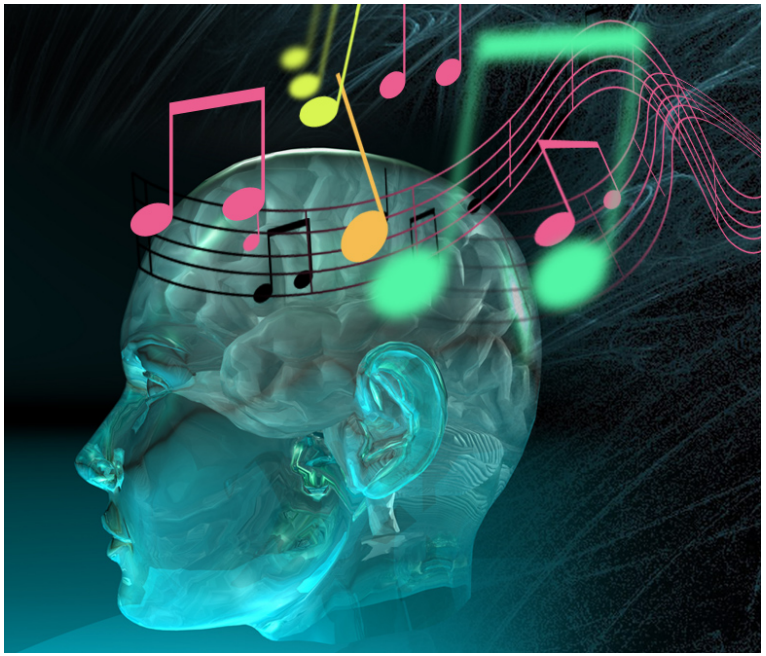


Cognitive reserve, music, and sports

Prof. dr. Erik Scherder

Dept. of Clinical Neuropsychology
VU university
Amsterdam, the Netherlands

Managing your Talents

Interdisciplinary Research on the Performing Arts August 29 and 30,2013

BRAIN RESEARCH REVIEWS 61 (2009) 221–239

ELSEVIER

available at www.sciencedirect.com

ScienceDirect

www.elsevier.com/locate/brainresrev

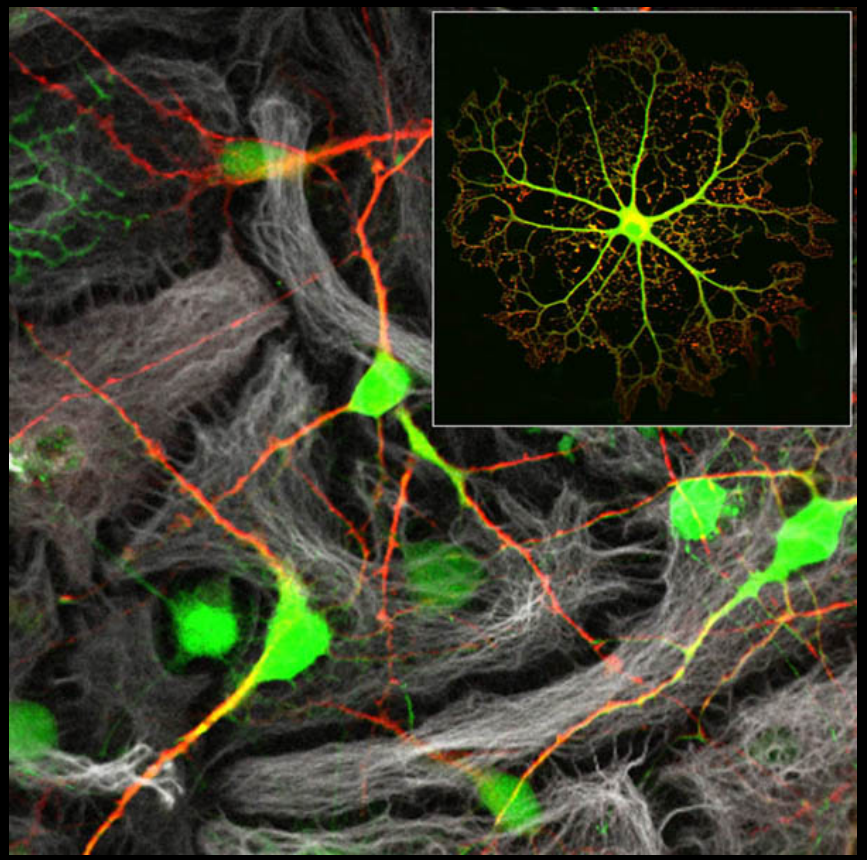
BRAIN RESEARCH REVIEWS

Review

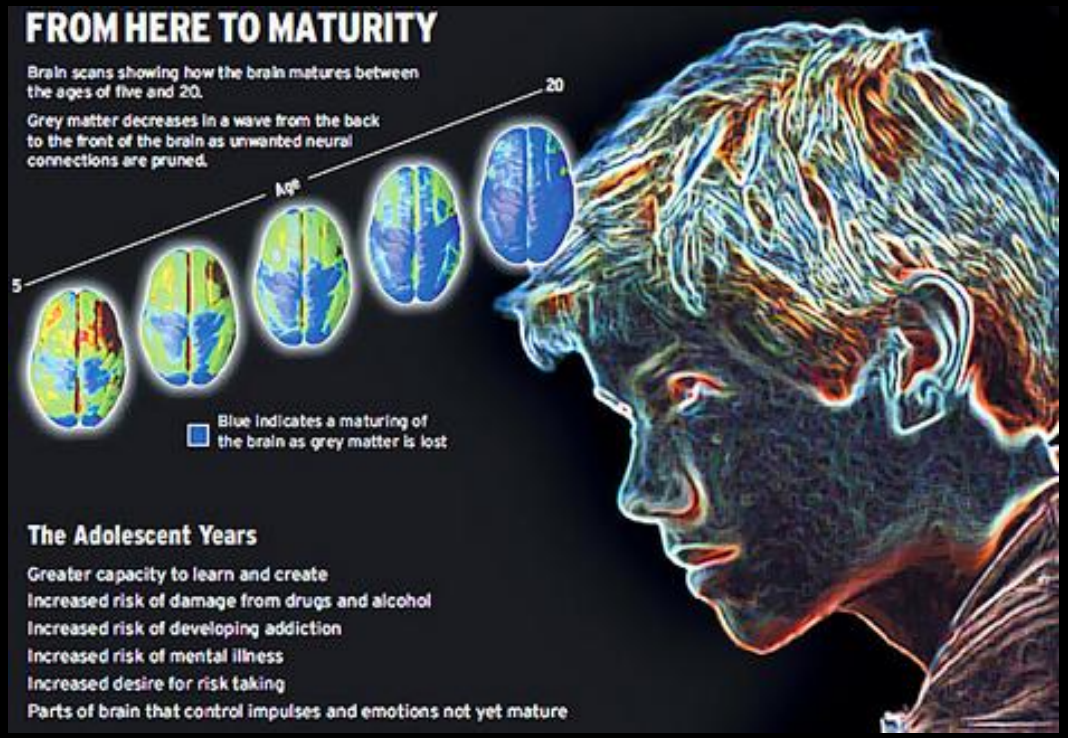
On whether the environmental enrichment may provide cognitive and brain reserves

Laura Petrosini[a,b,*], *Paola De Bartolo*[a,b], *Francesca Foti*[a,b], *Francesca Gelfo*[c,b], *Debora Cutuli*[a,b], *Maria Giuseppa Leggio*[a,b], *Laura Mandolesi*[c,b]

[a]*Department of Psychology, University "Sapienza" of Rome*
[b]*Fondazione Santa Lucia, Rome*
[c]*University "Parthenope", Naples*



Adult neural stem cells neurogenesis


FROM HERE TO MATURITY
Brain scans showing how the brain matures between the ages of five and 20.
Grey matter decreases in a wave from the back to the front of the brain as unwanted neural connections are pruned.
5
Age
20
Blue indicates a maturing of the brain as grey matter is lost
The Adolescent Years
Greater capacity to learn and create
Increased risk of damage from drugs and alcohol
Increased risk of developing addiction
Increased risk of mental illness
Increased desire for risk taking
Parts of brain that control impulses and emotions not yet mature

CORTEX 47 (2011) 1126–1137

available at www.sciencedirect.com

ScienceDirect

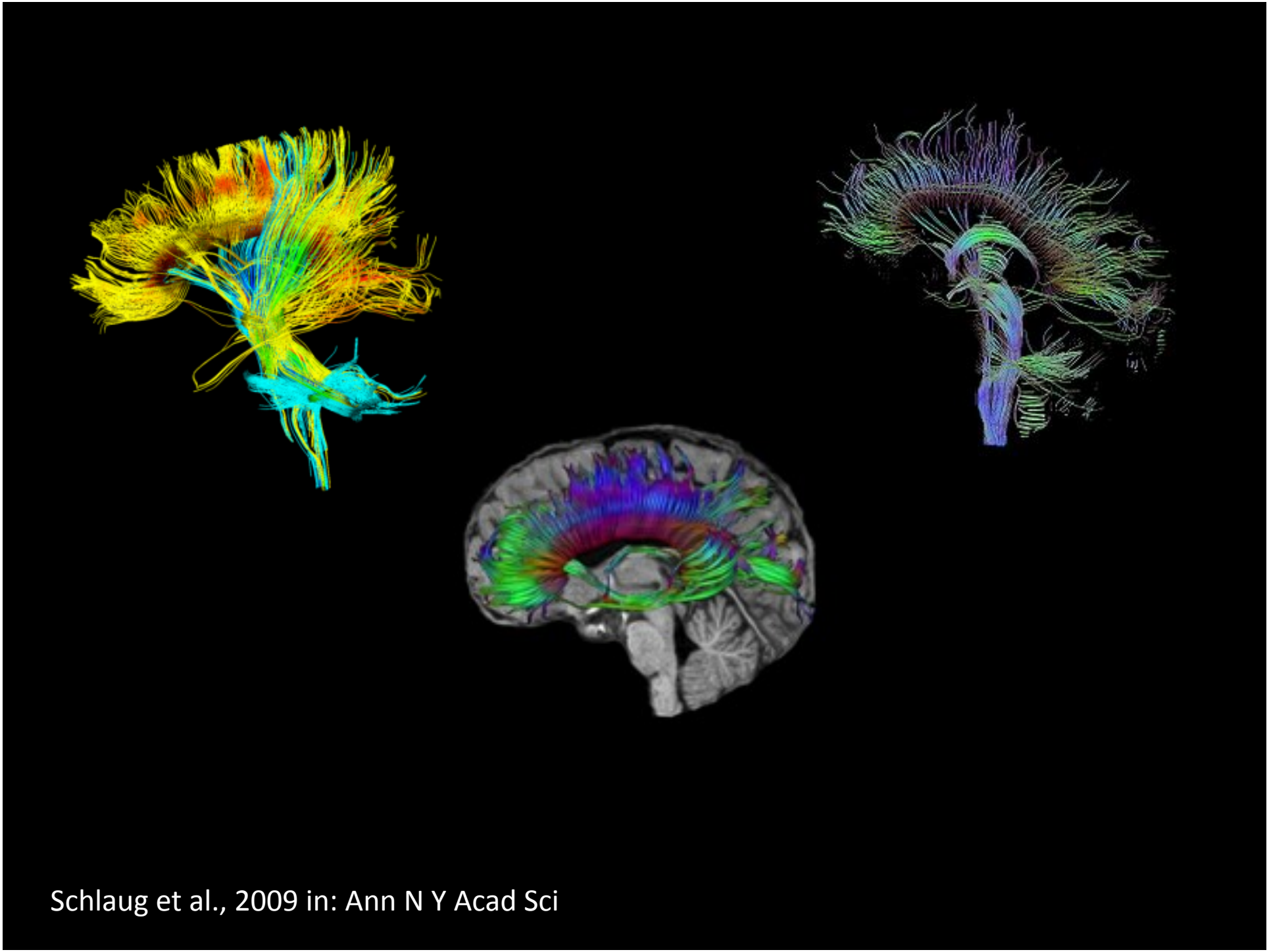
journal homepage: www.elsevier.com/locate/cortex

Review

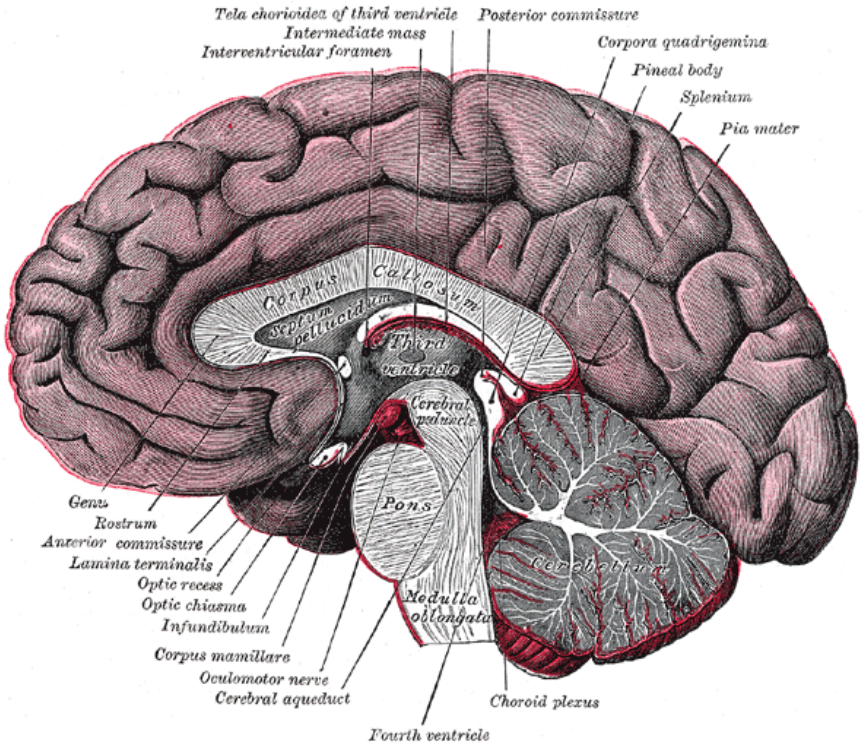
Sensitive periods in human development: Evidence from musical training

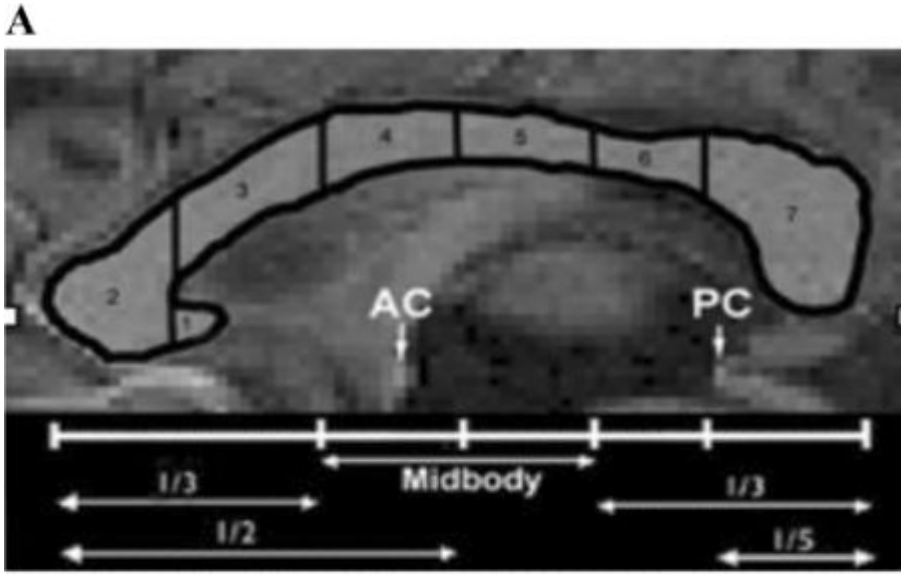
Virginia B. Penhune [a,b,c,*]

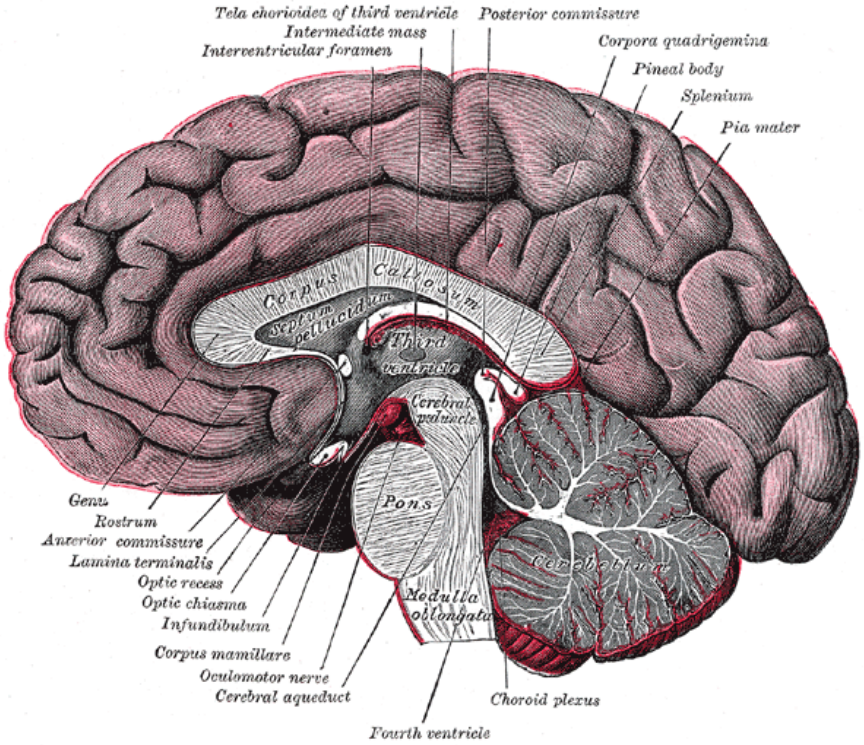
[a] *Department of Psychology, Concordia University, Montreal, QC, Canada*
[b] *Montreal Laboratory for Brain Music and Sound – BRAMS, Montreal, QC, Canada*
[c] *Centre for Research in Human Development, Montreal, QC, Canada*

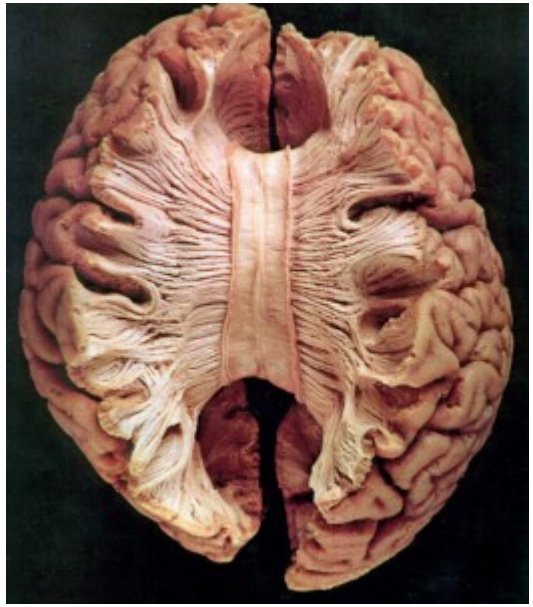


Schlaug et al., 2009 in: Ann N Y Acad Sci


Tela chorioidea of third ventricle
Intermediate mass
Interventricular foramen
Posterior commissure
Corpora quadrigemina
Pineal body
Splenium
Pia mater
Corpus callosum
Septum pellucidum
Third ventricle
Cerebral peduncle
Pons
Cerebellum
Medulla oblongata
Genu
Rostrum
Anterior commissure
Lamina terminalis
Optic recess
Optic chiasma
Infundibulum
Corpus mamillare
Oculomotor nerve
Cerebral aqueduct
Fourth ventricle
Choroid plexus







Schlaug et al., Ann N Y Acad Sci. 2009 July ; 1169: 205–208.

nature neuroscience

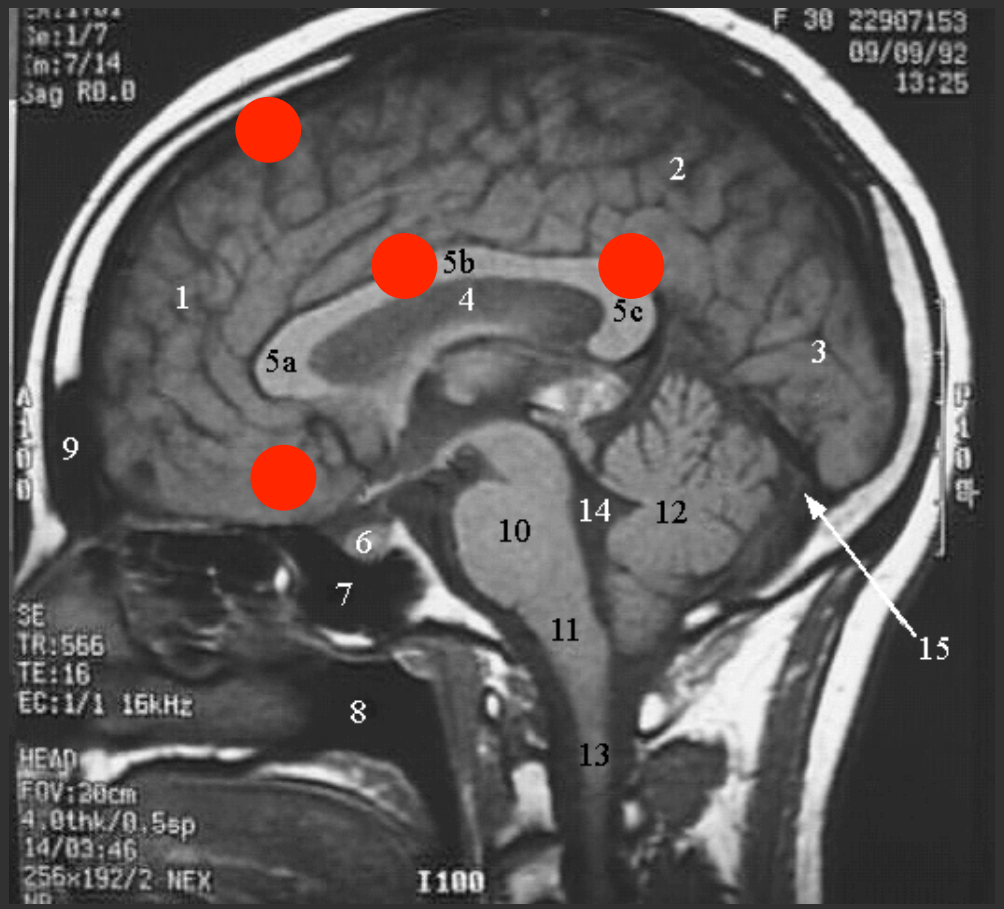
Extensive piano practicing has regionally specific effects on white matter development

Sara L Bengtsson[1], Zoltán Nagy[1,2], Stefan Skare[2], Lea Forsman[1], Hans Forssberg[1] & Fredrik Ullén[1]

32.6 ± 5.7 (s.d.) years, using the magnetic resonance technique diffusion tensor imaging (DTI)[7]. A group of eight male, age-matched non-musicians served as controls. Fractional anisotropy (FA)[7] in each voxel was used as a measure of the degree of water diffusion anisotropy. FA can be used for inferences about the microstructural properties of white matter, as diffusion is faster along axons than in the perpendicular direction (see **Supplementary Methods** online).

We regressed FA on the estimated total number of hours practiced

Age < 11


F 30 22907153
09/09/92
13:25
Se:1/7
Im:7/14
Sag RO.0
SE
TR:566
TE:16
EC:1/1 16kHz
HEAD
FOV:30cm
4.0thk/0.5sp
14/03:46
256x192/2 NEX
I100
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3
4
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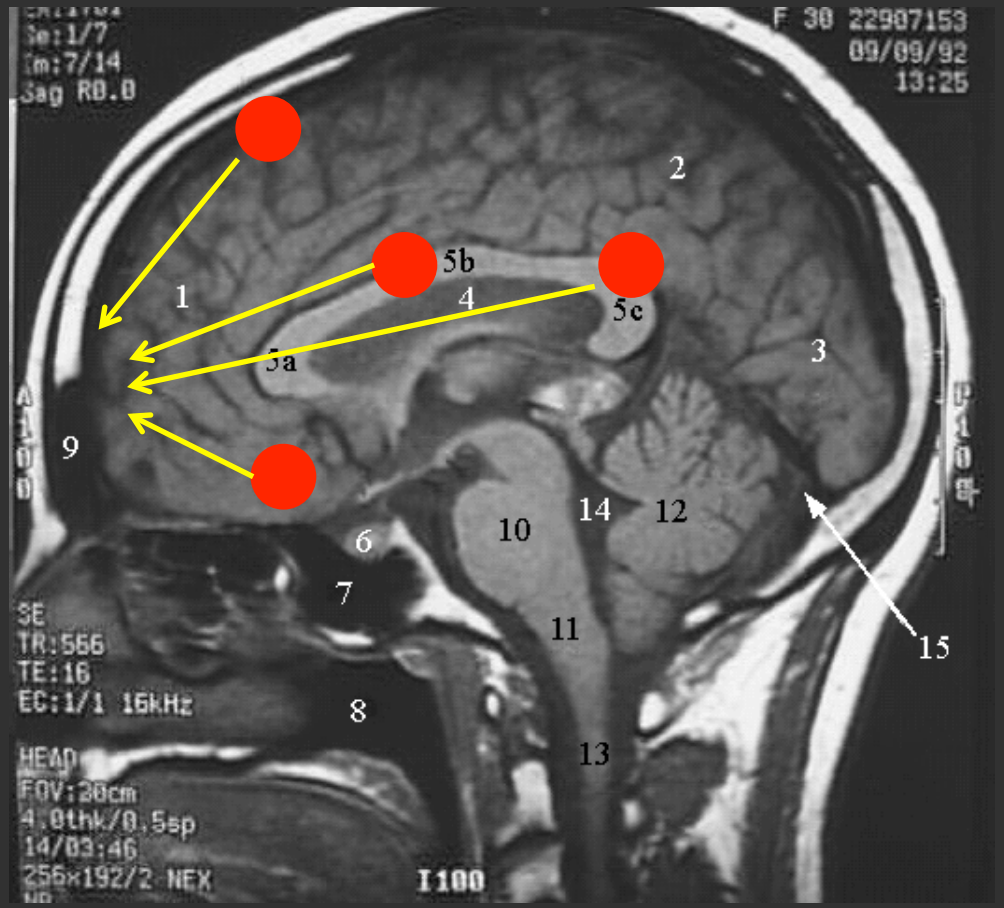
15

Age < 11


F 30 22907153
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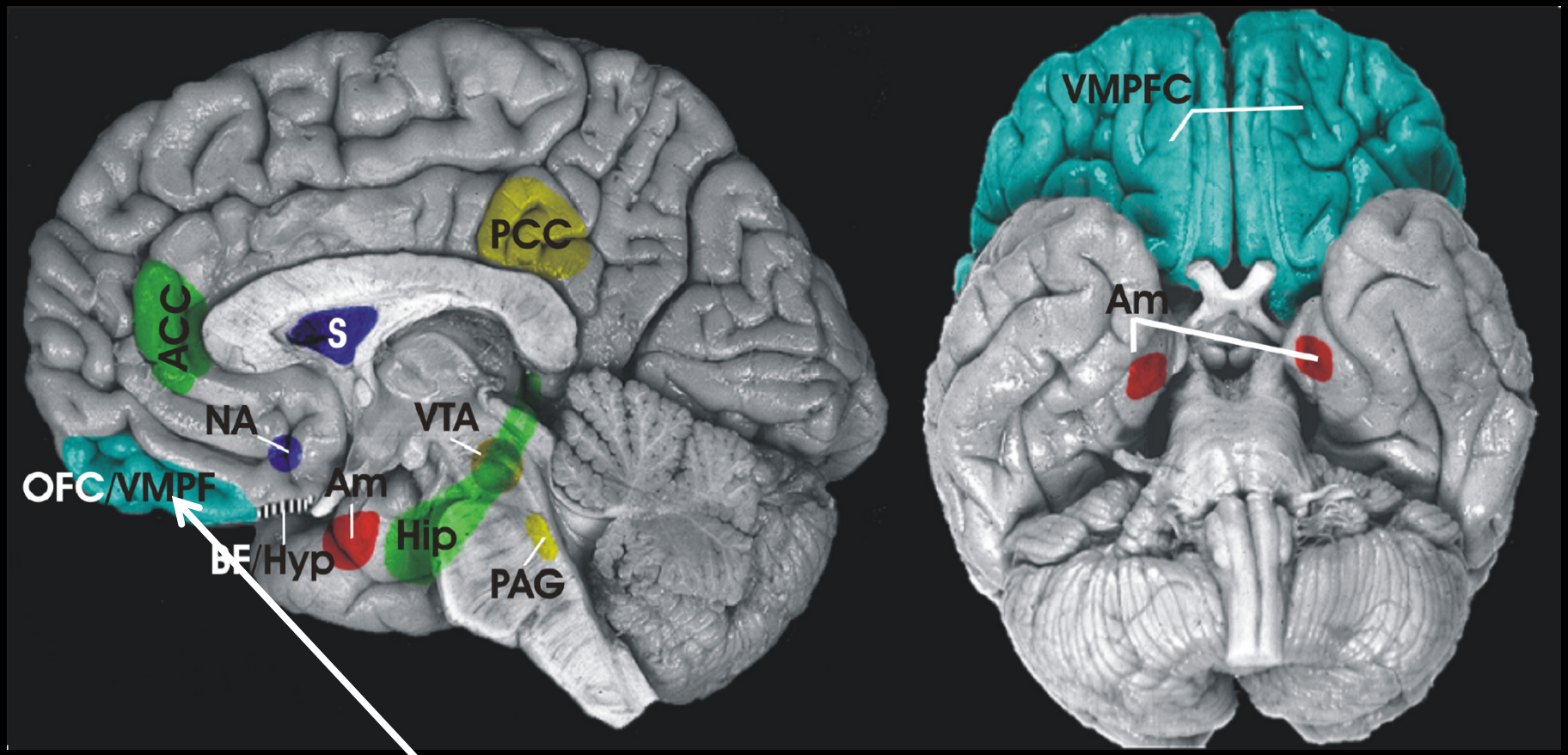
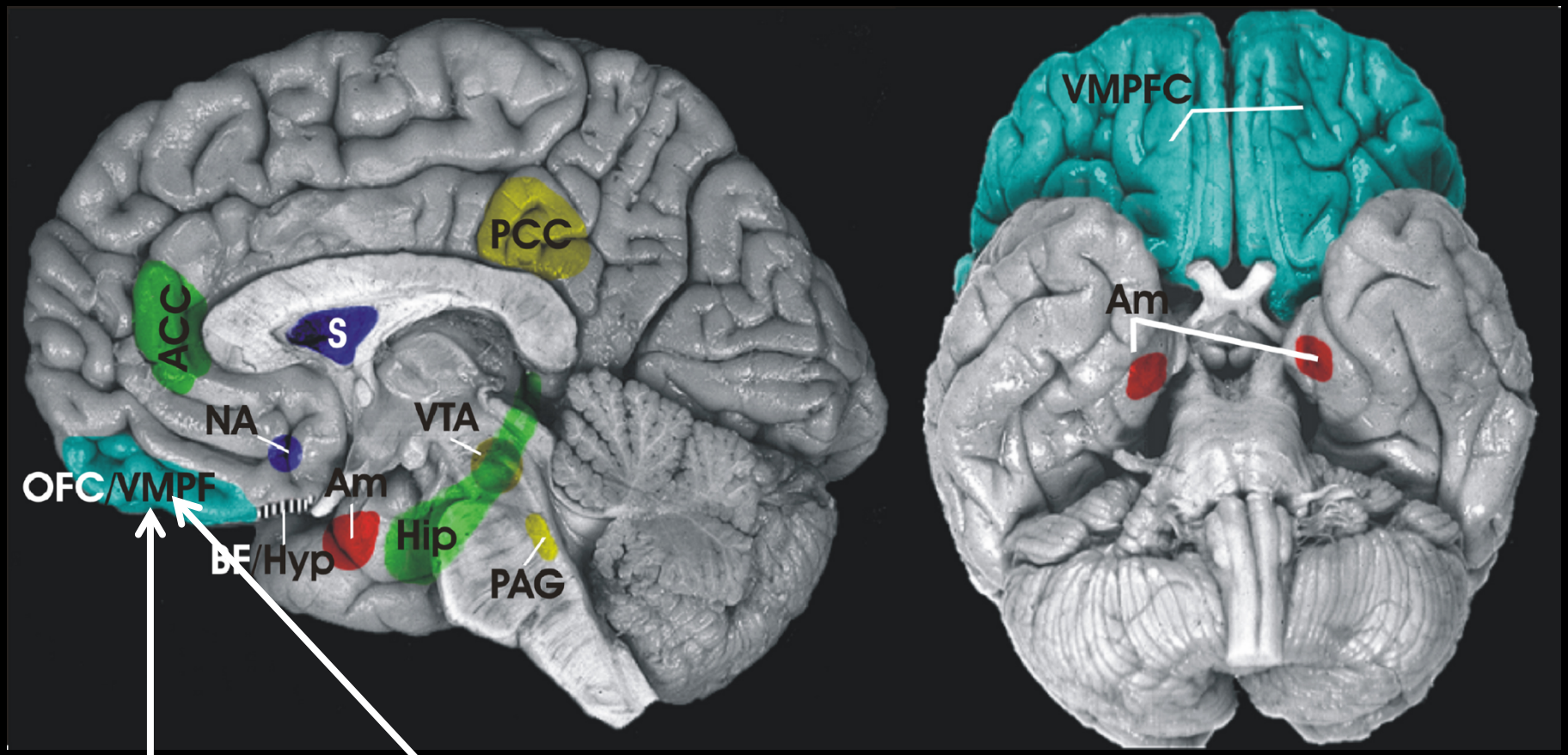
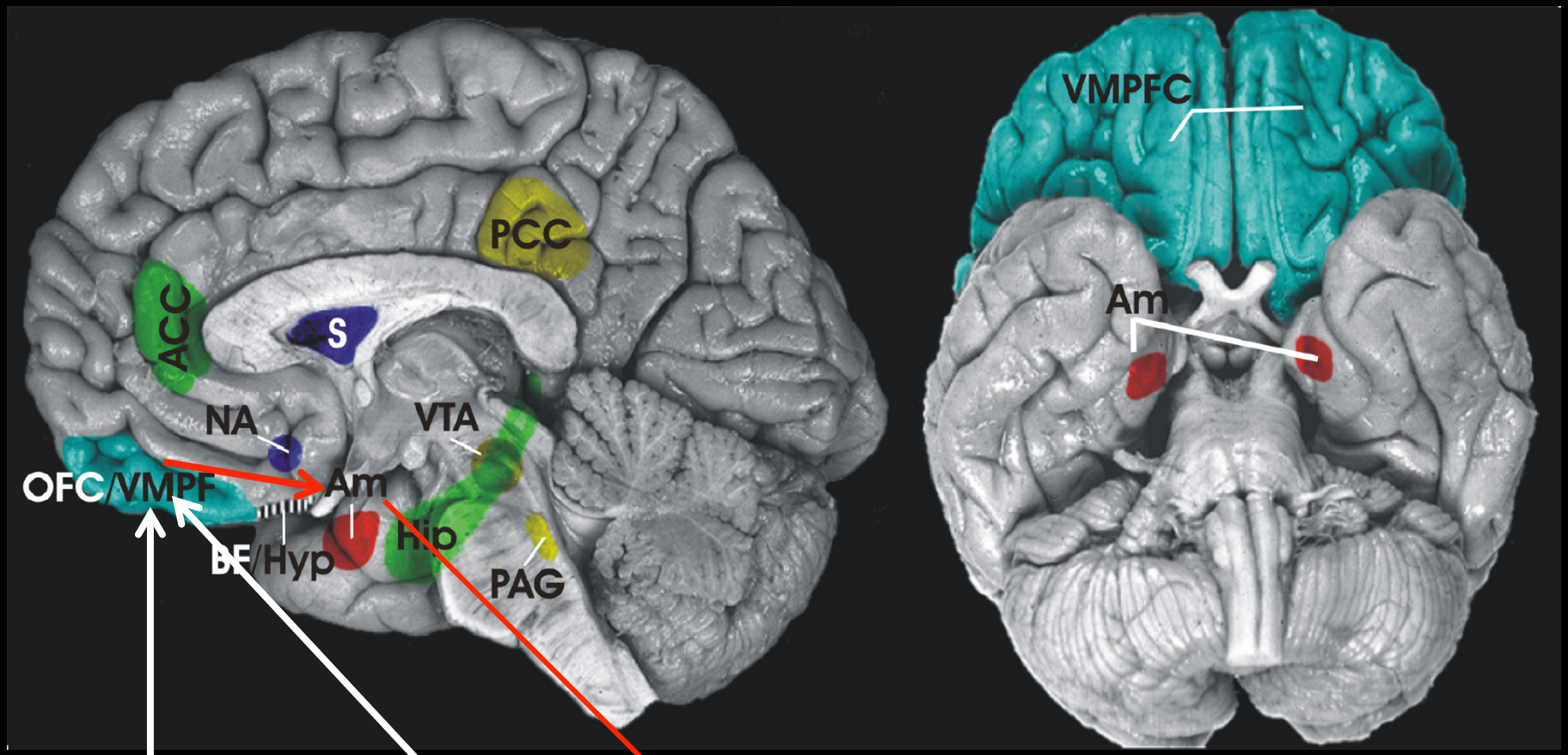


Autonomic responses to music



Autonomic responses to music

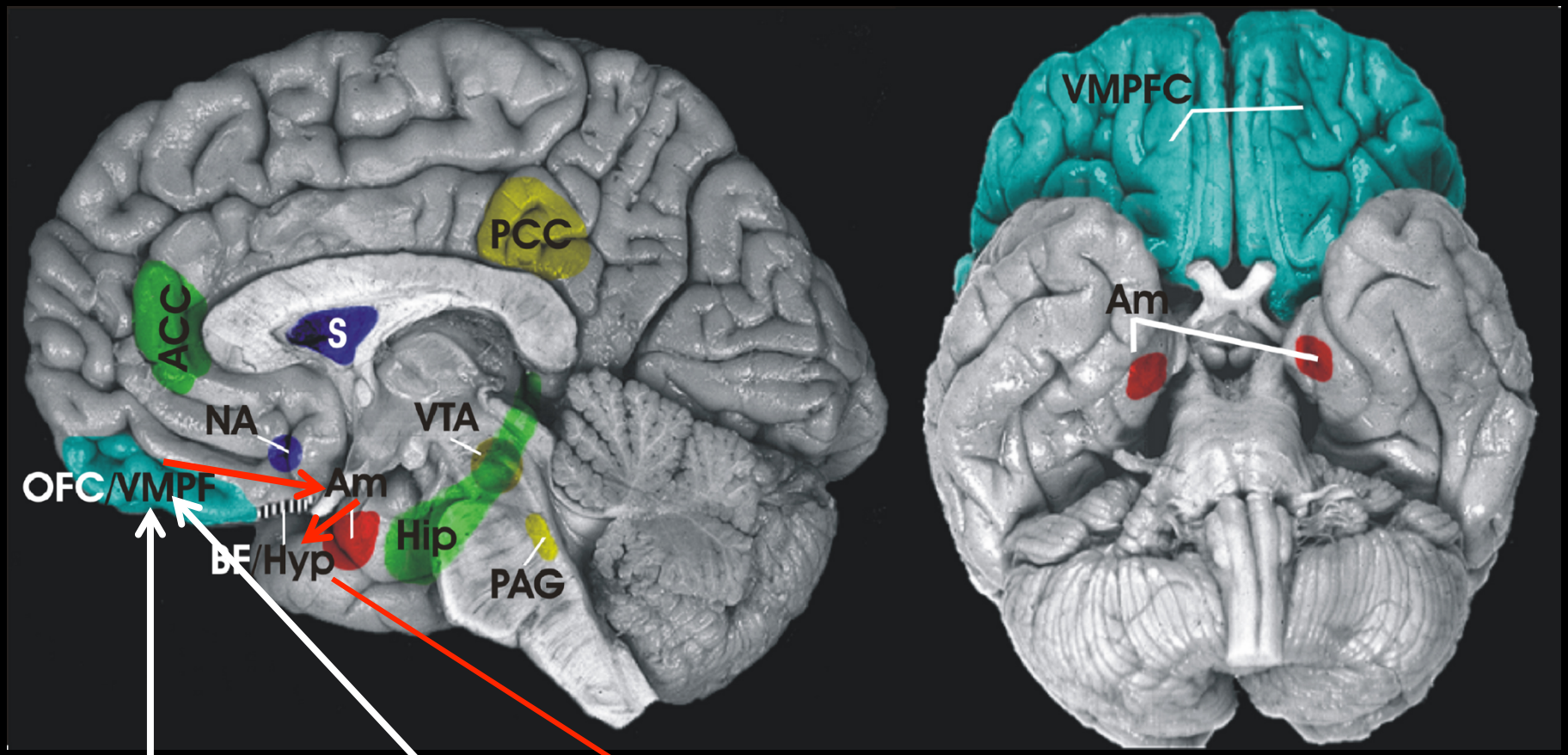
Empathy
Social cooperation
Self-reflection
Impulse control



Inhibition of negative emotions

Autonomic responses to music

Empathy
Social cooperation
Self-reflection
Impulse control



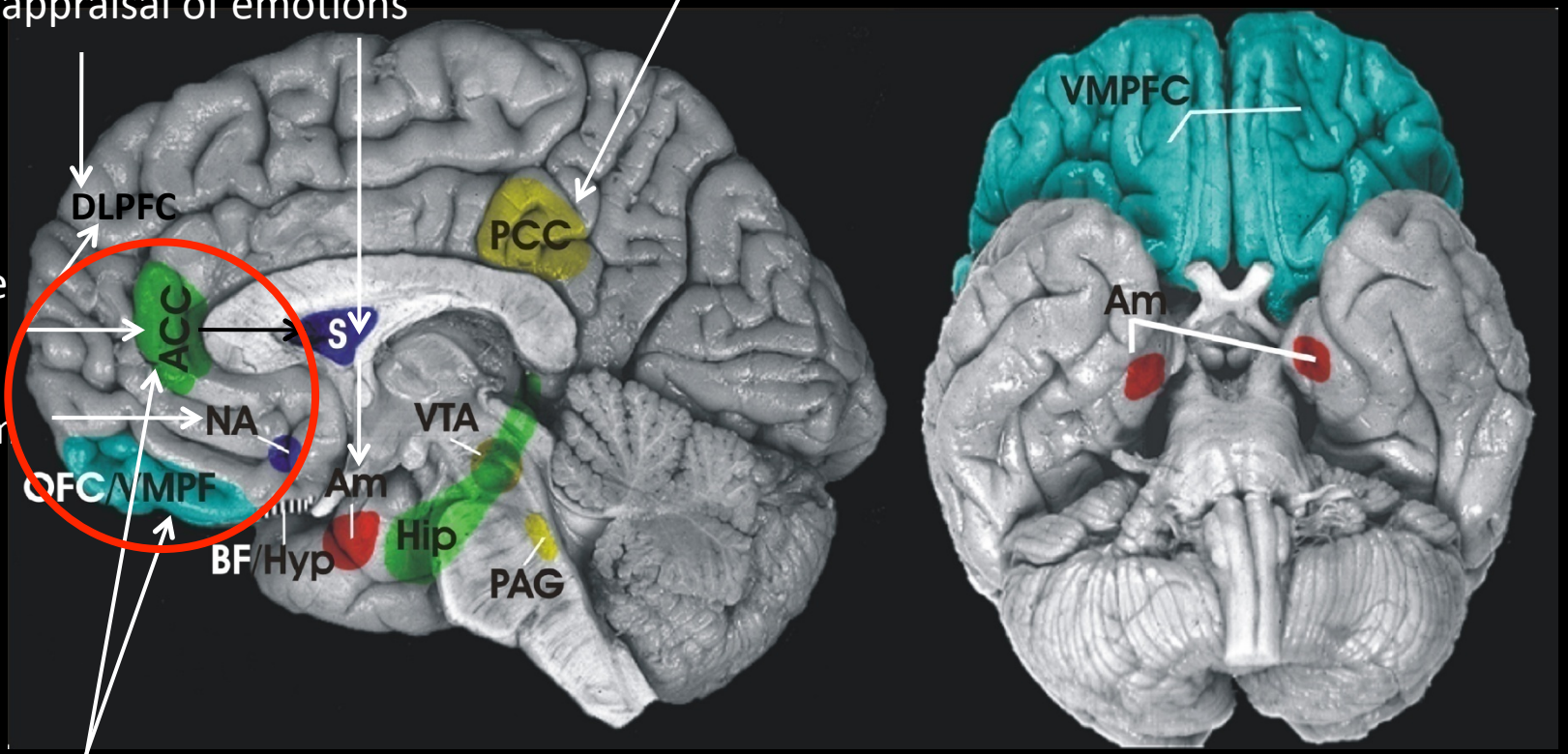
Inhibition of stress-axis

Autonomic responses to music

Empathy
Social cooperation
Self-reflection
Impulse control

Delaying rewards
Reappraisal of emotions

Moral sensitivity



Impulse control

Altruism

Empathy/Mentalizing
Social cooperation
Moral decision making
Self-reflection/inner speech

ORIGINAL ARTICLE

Neurobiology of Wisdom

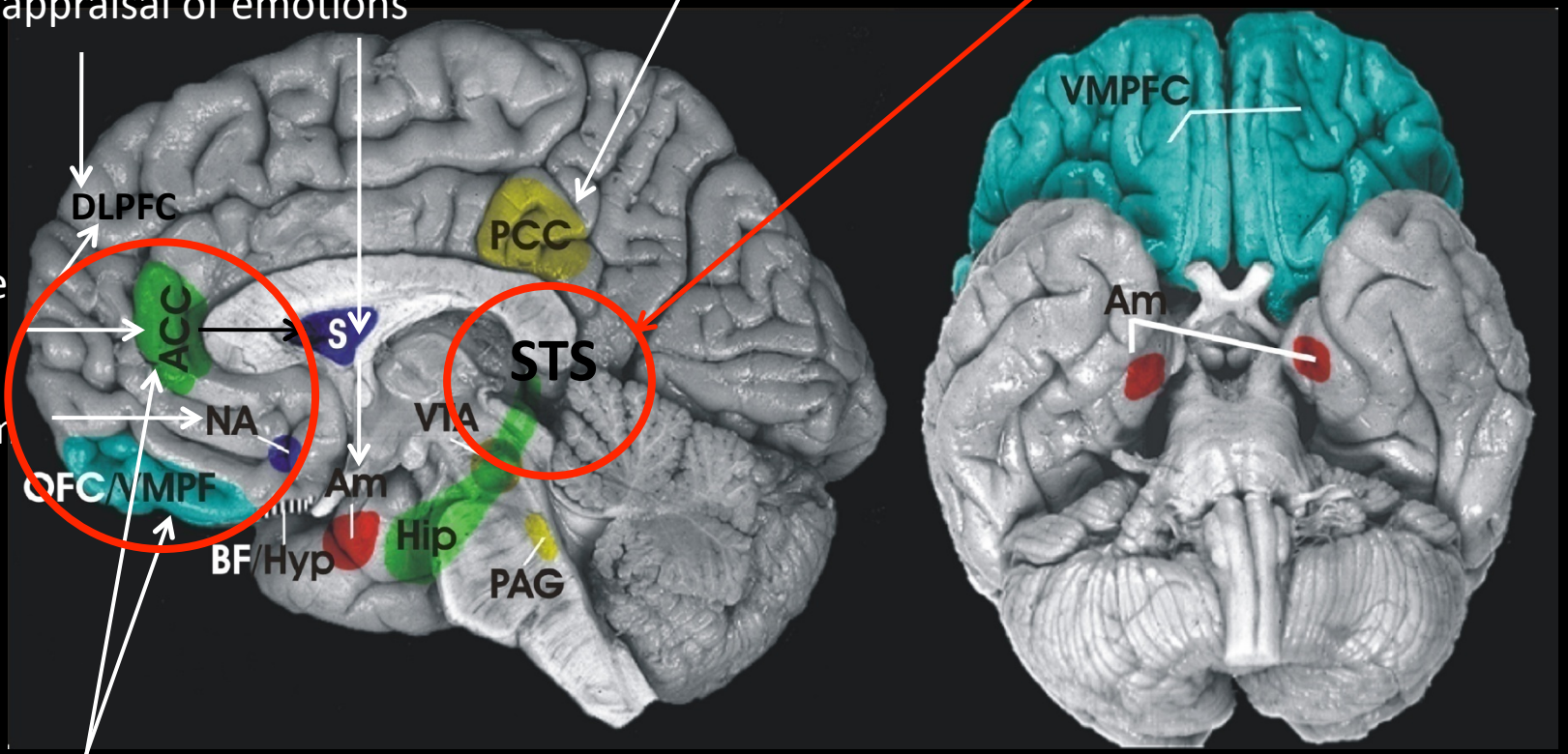
A Literature Overview

Thomas W. Meeks, MD; Dilip V. Jeste, MD

Superior Temporal Sulcus

Delaying rewards
Reappraisal of emotions

Moral sensitivity



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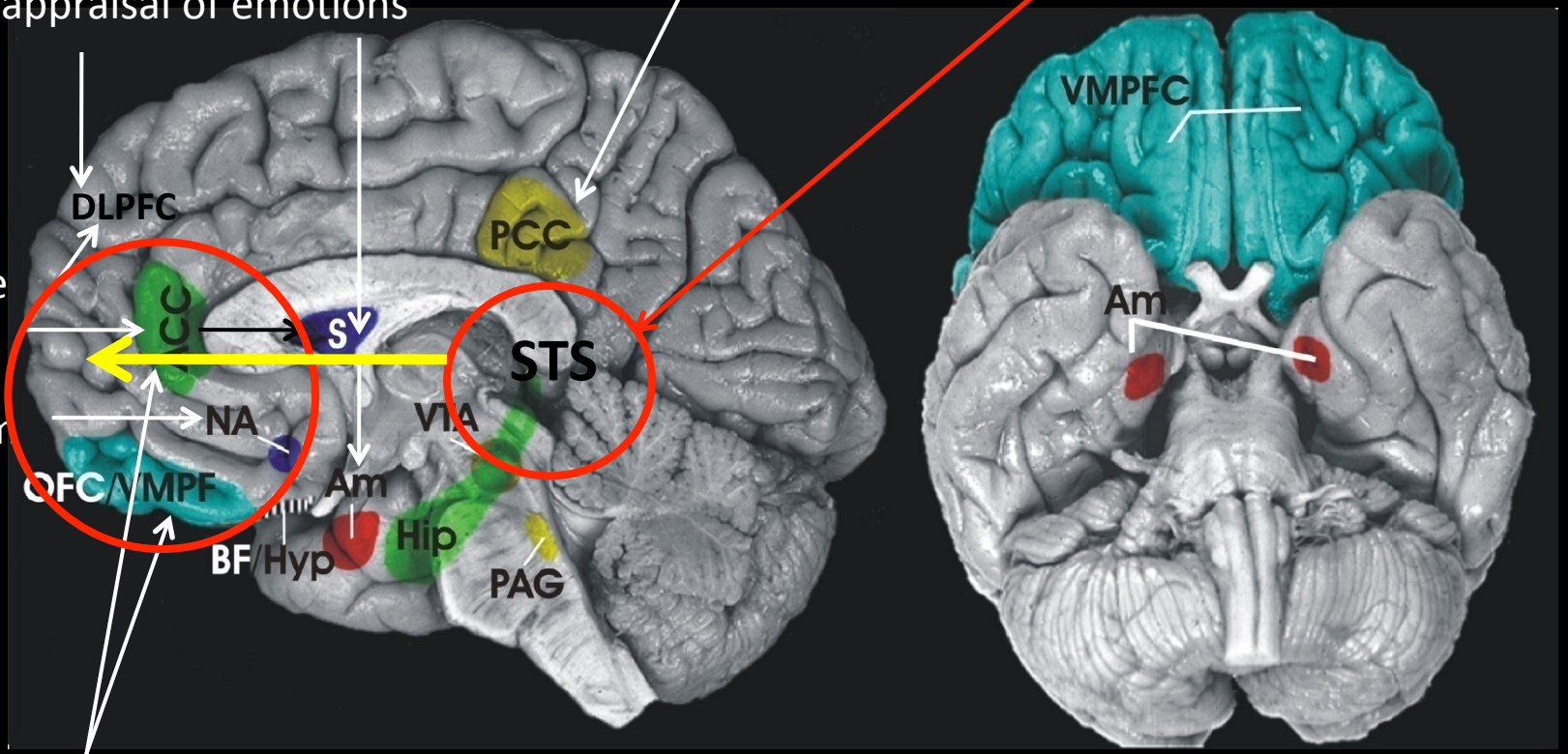

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OPEN ACCESS Freely available online

PLoS one

Increased Cortical Thickness in Sports Experts: A Comparison of Diving Players with the Controls

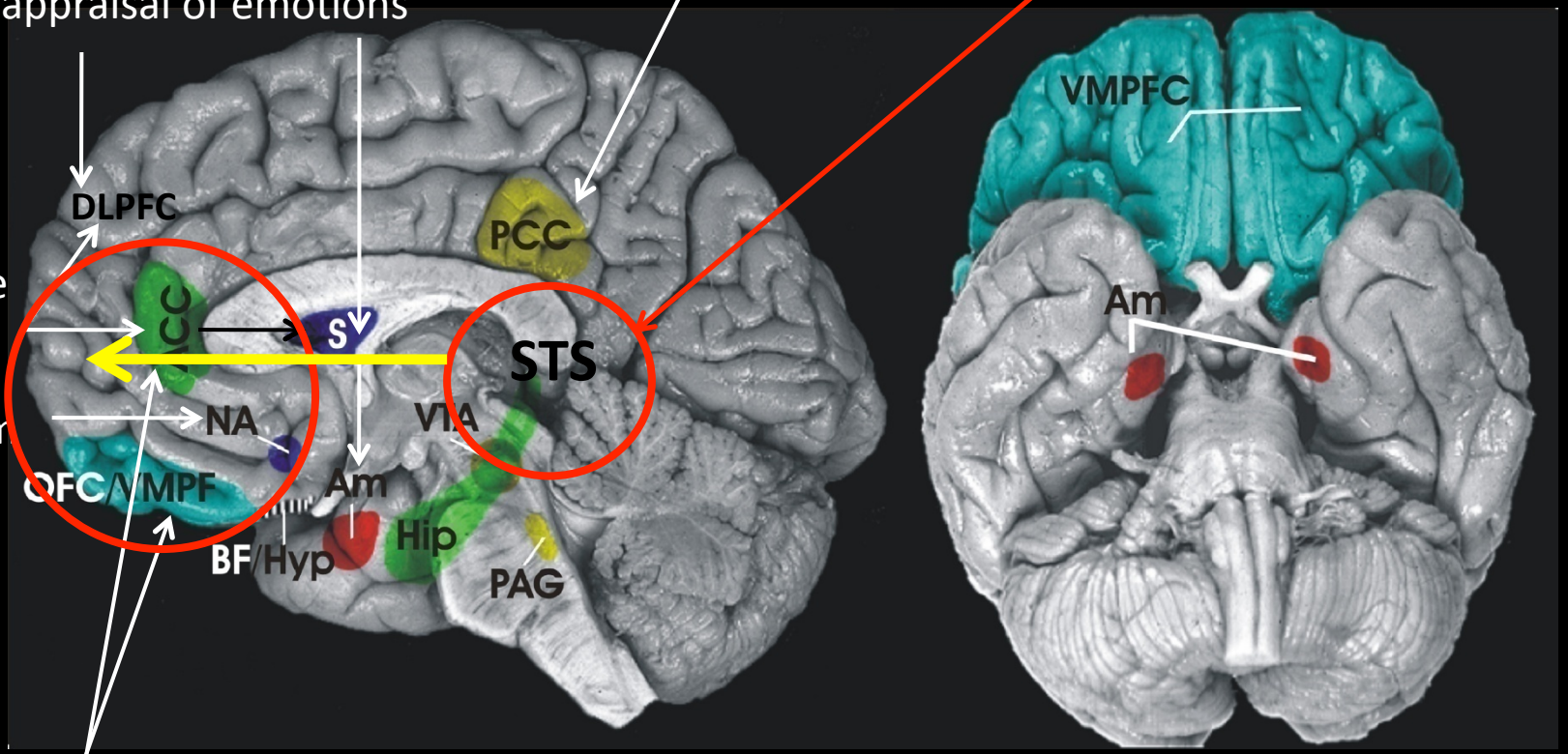
Gaoxia Wei[1☯], Yuanchao Zhang[2,3☯], Tianzi Jiang[3]*, Jing Luo[1]*

1 Key Laboratory of Mental Health, Institute of Psychology, Chinese Academy of Sciences (CAS), Beijing, People's Republic of China, **2** School of Life Sciences and Technology, University of Electronic Science and Technology of China, Chengdu, People's Republic of China, **3** National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, Beijing, People's Republic of China

Superior Temporal Sulcus

Delaying rewards
Reappraisal of emotions

Moral sensitivity



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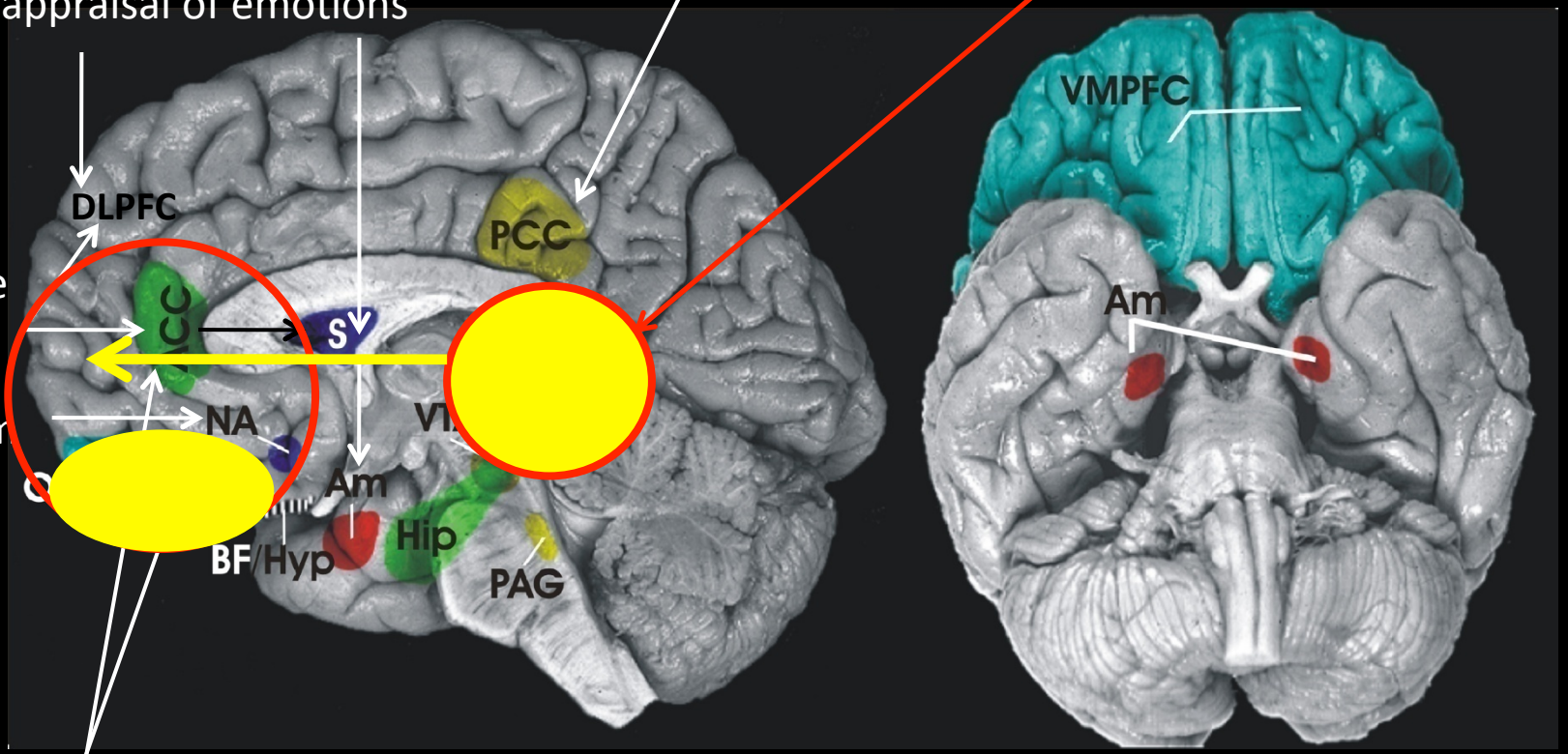

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SPECIAL COMMUNICATIONS

Rapid Communications

2011 Compendium of Physical Activities: A Second Update of Codes and MET Values

BARBARA E. AINSWORTH[1,2], WILLIAM L. HASKELL[3], STEPHEN D. HERRMANN[1,2], NATHANAEL MECKES[1,2], DAVID R. BASSETT JR.[4], CATRINE TUDOR-LOCKE[5], JENNIFER L. GREER[1,2], JESSE VEZINA[1,2], MELICIA C. WHITT-GLOVER[6], and ARTHUR S. LEON[7]

[1]Exercise and Wellness Program, School of Nutrition and Health Promotion, Arizona State University, Phoenix, AZ; [2]Healthy Lifestyles Research Center, School of Nutrition and Health Promotion, Arizona State University, Phoenix, AZ; [3]Stanford Prevention Research Center, School of Medicine, Stanford University, Palo Alto, CA; [4]Department of Kinesiology, Recreation, and Sports Studies, University of Tennessee, Knoxville, TN; [5]Walking Behavior Laboratory, Pennington Biomedical Research Center, Baton Rouge, LA; [6]Gramercy Research Group, Winston-Salem, NC; and [7]School of Kinesiology, University of Minnesota, Minneapolis, MN

2011 Compendium of Physical Activities

	METS
Bicycling	6.8-7.5
Home cleaning	3.3
Accordion	1.8
Cello	2.3
Bass	2.5
Drums	3.8
Flute	2.0
Horn	1.8
Piano	2.3
Guitar	2.0

Light intensity:
1.6-2.9

Thank you for your attention!