



VIII^o C Corso Nazionale Congiunto

BERTINORO 2010

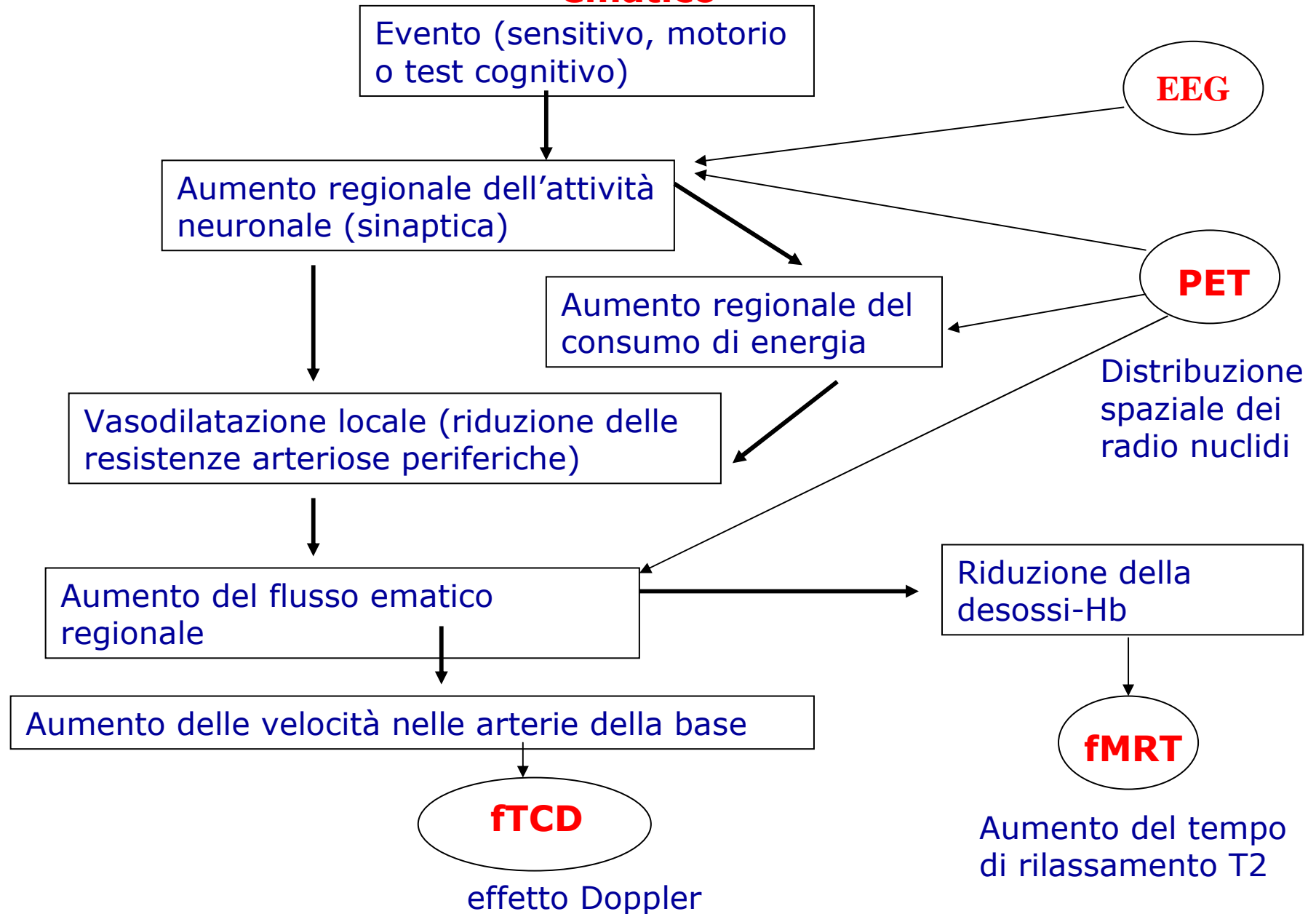
Test di attivazione cognitiva: Metodi a confronto

Marinella Marinoni

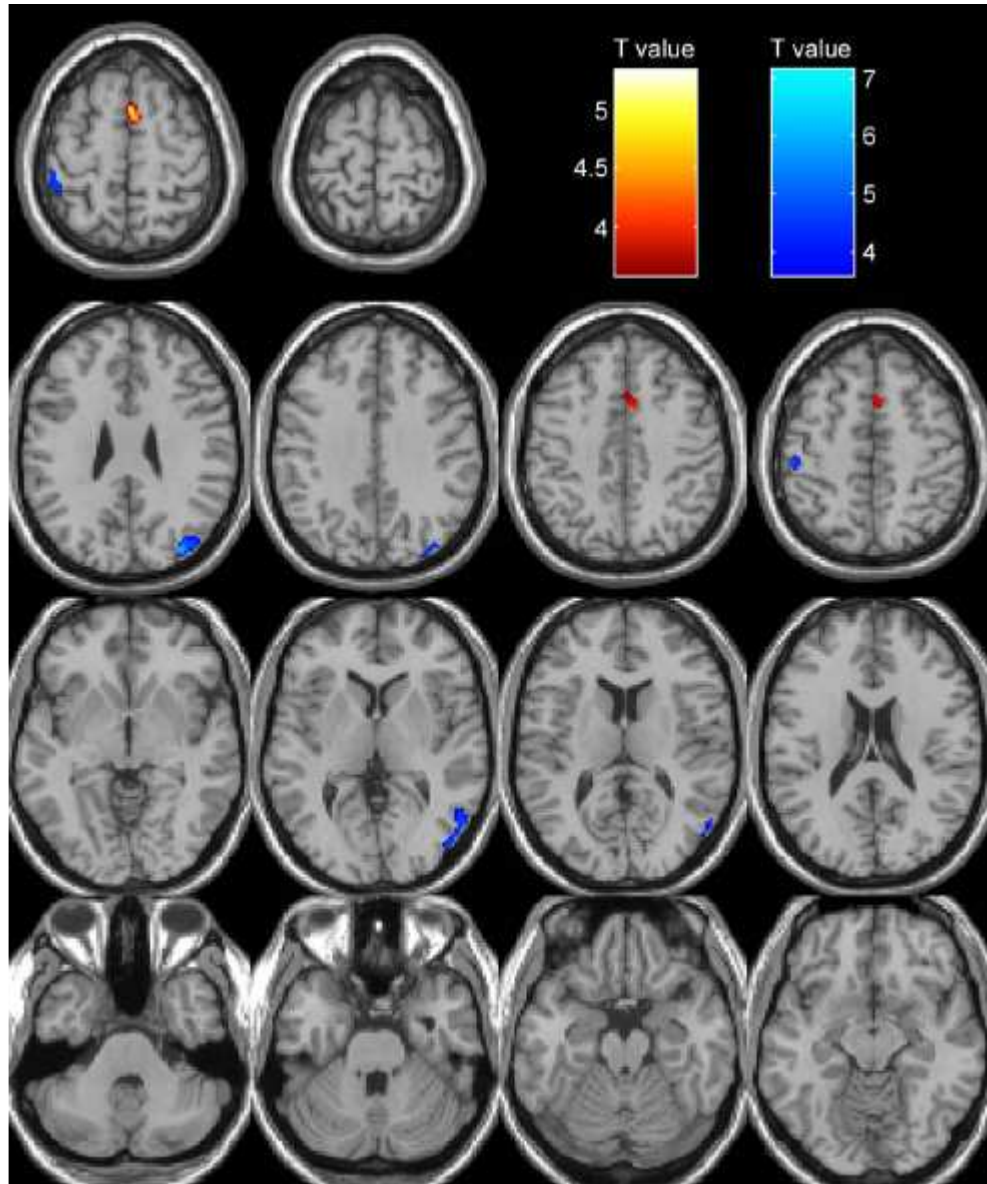
Laboratorio di Neurosonologia
Università degli Studi di Firenze

Accoppiamento neuro-vascolare

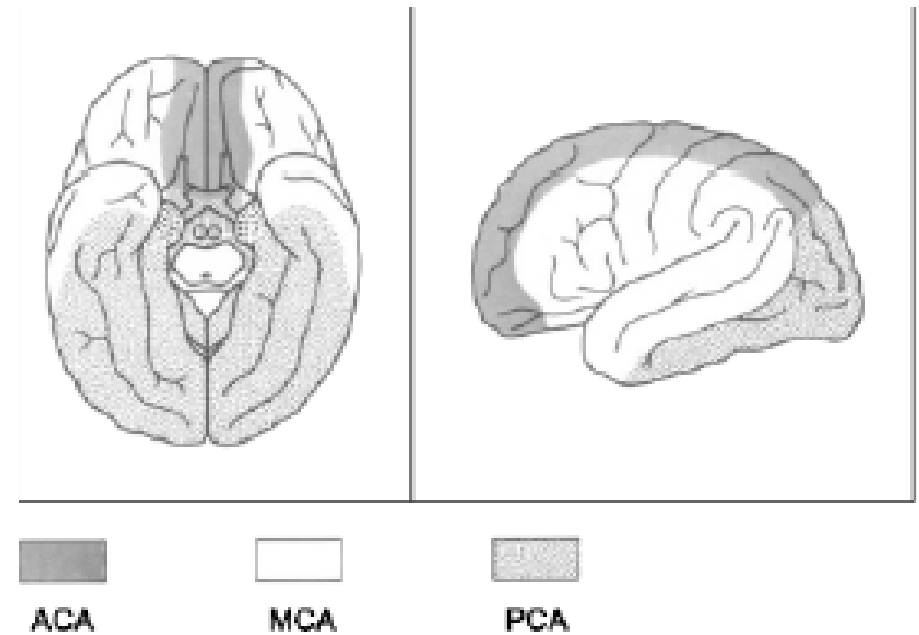
correlazione tra attività neuronale, metabolismo cerebrale e flusso ematico



fMRI alta risoluzione spaziale



fTCD bassa risoluzione spaziale



Imaging Cognition II: An Empirical Review of 275 PET and fMRI Studies

Roberto Cabeza

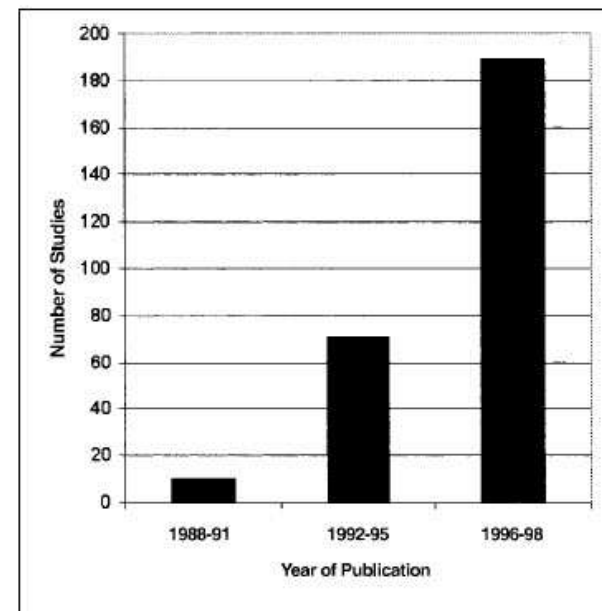
University of Alberta

Lars Nyberg

Umeå University, Sweden

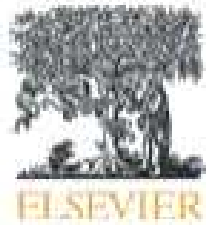
Journal of Cognitive Neuroscience 12:1, pp. 1–47

Neuroanatomia funzionale cognitiva



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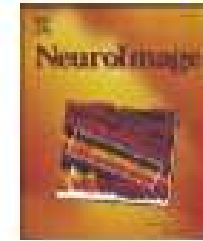
Increase in publication rate of cognitive PET and fMRI studies.



Contents lists available at ScienceDirect

NeuroImage

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

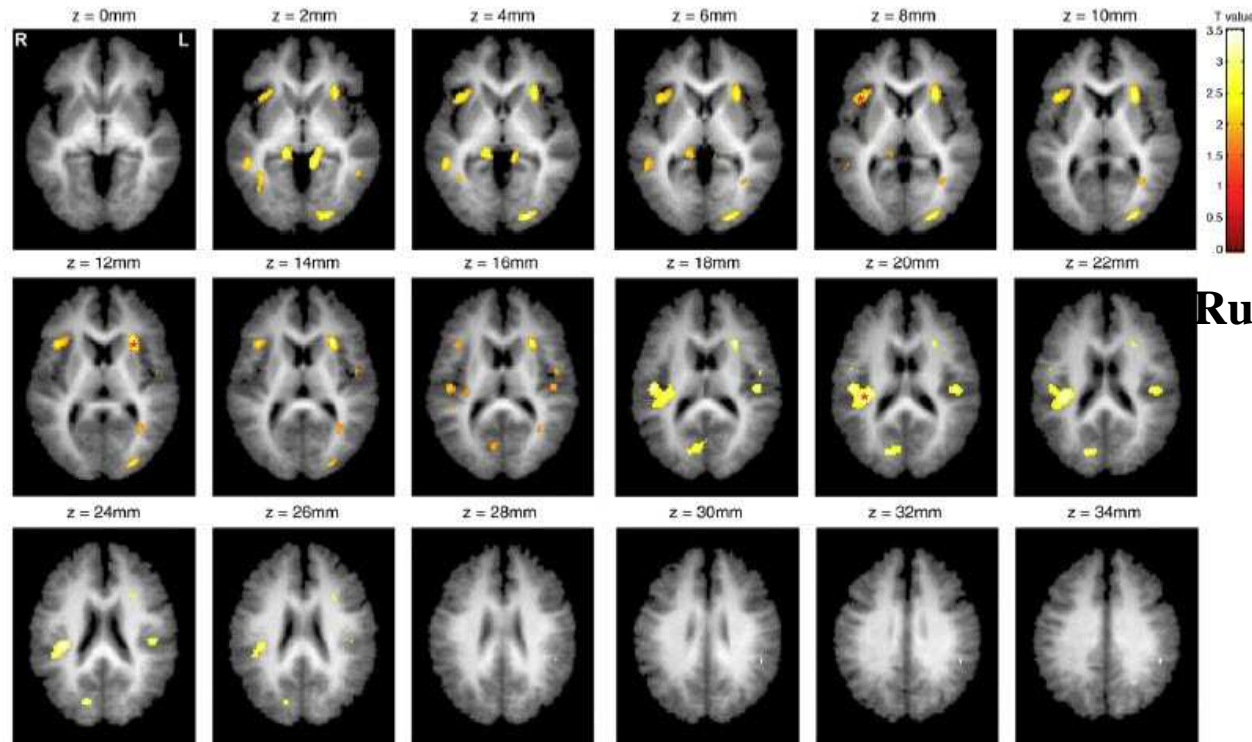


Association of individual resting state EEG alpha frequency and cerebral blood flow

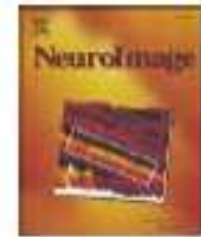
Kay Jann^{a,*}, Thomas Koenig^a, Thomas Dierks^a, Chris Boesch^b, Andrea Federspiel^a

^a Department of Psychiatric Neurophysiology, University Hospital of Psychiatry, University of Bern, Bolligenstrasse 111, 3000 Bern 60, Switzerland

^b Department of Clinical Research, AMSM, Inselspital and University of Bern, Ravillon 52 Inselspital, P.O.Box 3.5, 3010 Bern, Switzerland



Ruolo del livello di attenzione



Association of individual resting state EEG alpha frequency and cerebral blood flow

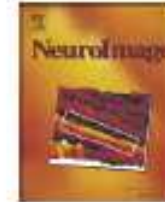
Kay Jann ^{a,*}, Thomas Koenig ^a, Thomas Dierks ^a, Chris Boesch ^b, Andrea Federspiel ^a

^a Department of Psychiatric Neurophysiology, University Hospital of Psychiatry, University of Bern, Bolligenstrasse 111, 3000 Bern 60, Switzerland

^b Department of Clinical Research, AMSM, Inselspital and University of Bern, Prvillon 52 Inselspital, P.O.Box 35, 3010 Bern, Switzerland

La correlazione tra frequenza del ritmo alfa all'EEG e rCBF in volontari sani mostra un network di aree cerebrali associate con la modulazione dell'attenzione e la prontezza della risposta a stimoli esterni, cruciali per l'esecuzione del test

Maggiore frequenza ritmo alfa basale → migliore performance nell'esecuzione del task → ridotta risposta del r CBF allo stimolo



Real versus imagined locomotion: A [^{18}F]-FDG PET-fMRI comparison

Christian la Fougère^{a,1}, Andreas Zwergal^{b,*}, Axel Rominger^a, Stefan Förster^a, Gunther Fesl^c,
Marianne Dieterich^b, Thomas Brandt^b, Michael Strupp^b, Peter Bartenstein^a, Klaus Jahn^b

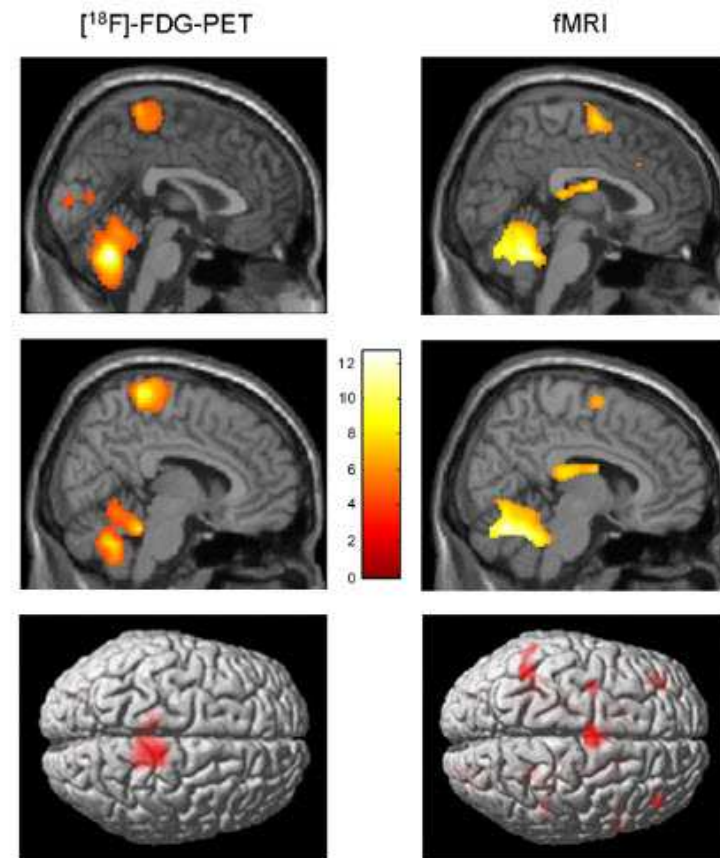
^a Department of Nuclear Medicine, Ludwig-Maximilians-University of Munich, Germany

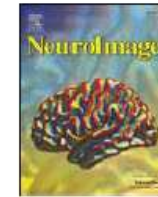
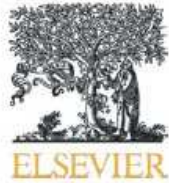
^b Department of Neurology, Ludwig-Maximilians-University of Munich, Germany

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PET, Locomozione reale: attivazione corteccia
motoria primaria e somatosensitiva

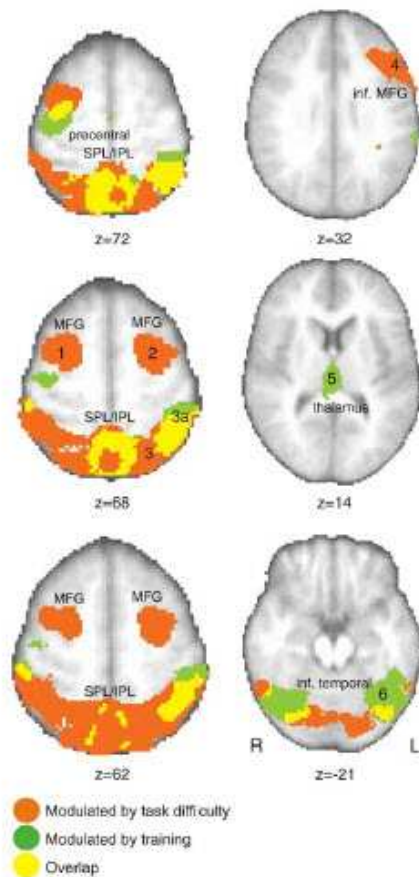
fMRI, Locomozione immaginata: corteccia
motoria supplementare e gangli della base





Cerebral correlates of analogical processing and their modulation by training

Isabell Wartenburger^{a,b,*}, Hauke R. Heekeren^{b,c}, Franziska Preusse^{b,d}, Jürg Kramer^e, Elke van der Meer^d

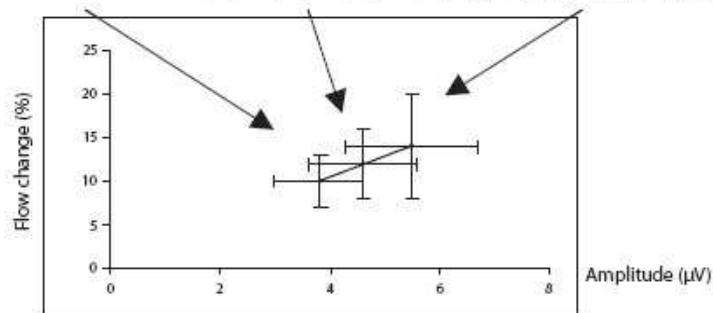


fMRI: Effetto della difficoltà e del training

A Simultaneous EEG and Transcranial Doppler Technique to Investigate the Neurovascular Coupling in the Human Visual Cortex

B. Rosengarten M. Kaps

Department of Neurology, Justus-Liebig University of Giessen, Giessen, Germany



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**Proposta di monitoraggio
multiparametrico semplice e a
basso costo**

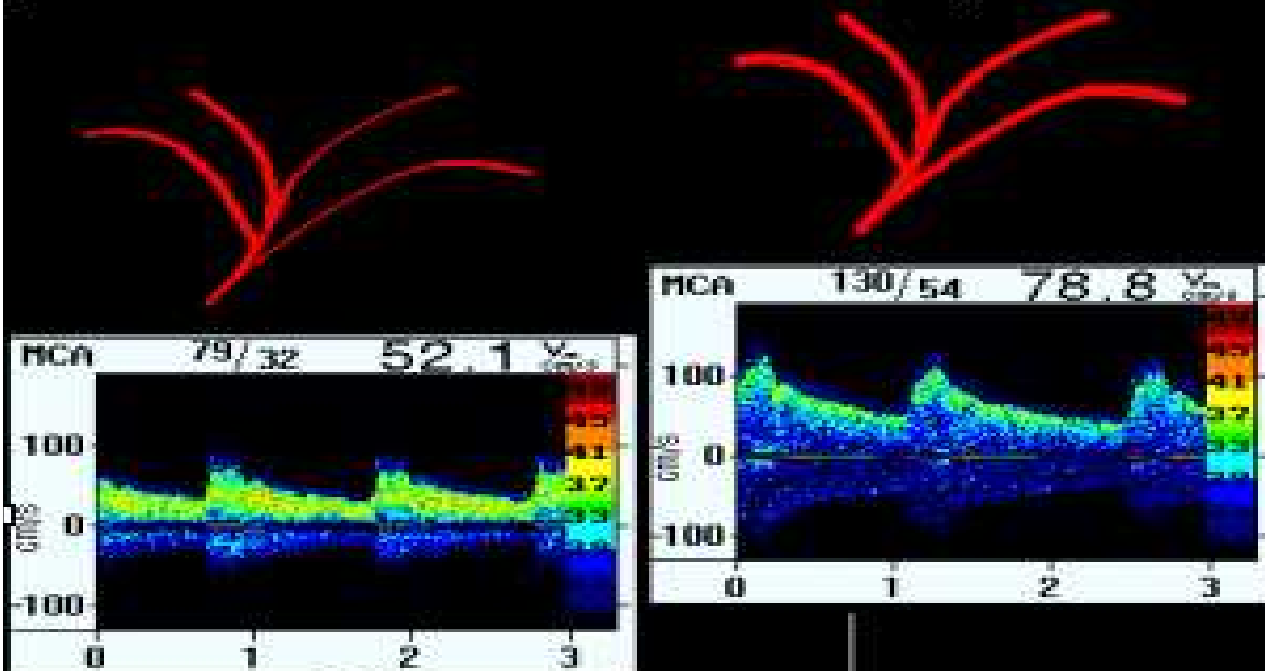
Doppler transcranico funzionale (fTCD)

- Monitoraggio continuo, simultaneo e bilaterale delle velocità di flusso sulle arterie cerebrali durante **stimolazioni specifiche**
- Misura indiretta delle variazioni di perfusione cerebrale correlati all' **attivazione neuronale**
- Alta **risoluzione temporale**

Attivazione Cognitiva

basale

dopo stimolo



MCA

The investigation of functional brain lateralization by transcranial Doppler sonography

Michael Deppe,* E. Bernd Ringelstein, and Stefan Knecht

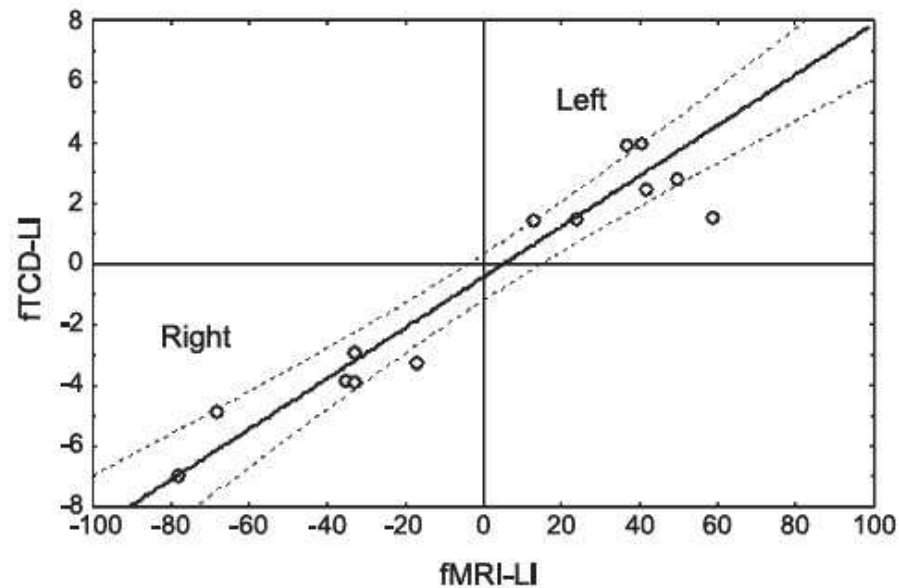


Fig. 23. Correlation between lateralization by fMRI and fTCD ($r = 0.95$) (Deppe et al., 1998).

The investigation of functional brain lateralization by transcranial Doppler sonography

Michael Deppe,* E. Bernd Ringelstein, and Stefan Knecht

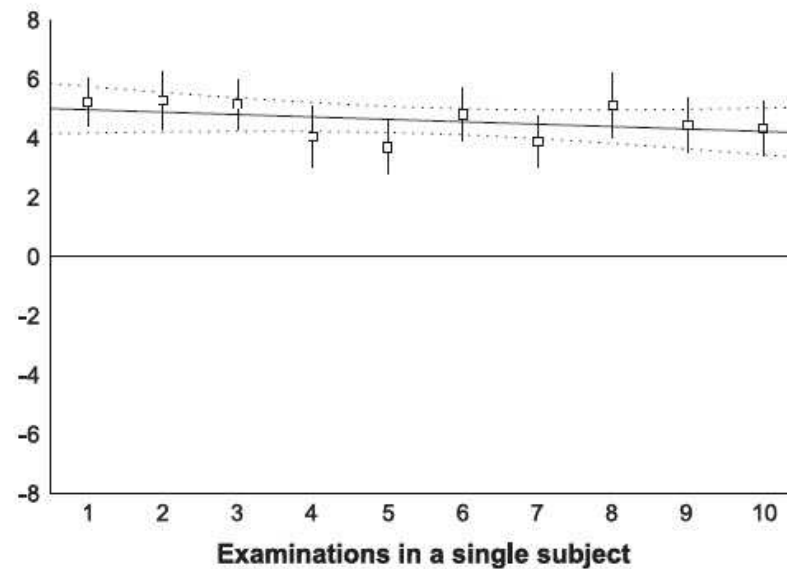


Fig. 21. Laterality indices of 10 repetitive examinations on the same subject. The ordinate represents the LIs (from Knecht et al., 1998b.)

Clinical study

Music and cerebral hemodynamics

M. Marinoni, Enrico Grassi, S. Latorraca, A. Caruso, S. Sorbi

Neurosonology Laboratory, Department of Neurological and Psychiatric Sciences, University of Florence, Florence, Italy

Summary Previous studies performed by positron emission tomography and Transcranial Doppler (TCD) found a different cerebral activation during musical stimuli in musicians compared to non-musicians. The aim of our study is to evaluate by means of TCD, possible different pattern of cerebral activation during the performance of different musical tasks in musicians, non-musicians and lyrical singers. Our findings show a left hemispheric activation in musicians and a right one in non-musicians. Preliminary data on lyrical singers' activation patterns need further confirmation with a larger population. These data could be related to a different approach to music listening in musicians (analytical) and non-musicians who are supposed to have an emotional approach to music. © 2000 Harcourt Publishers Ltd

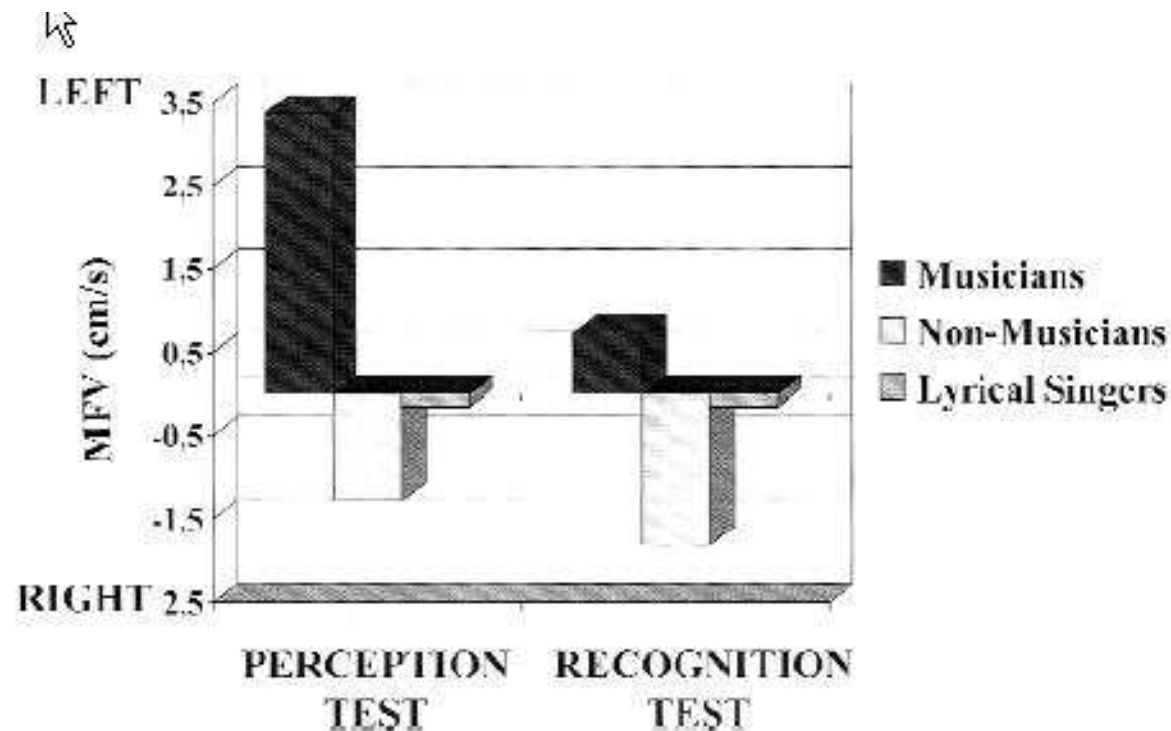
Keywords: transcranial Doppler ultrasonography, hemispheric lateralization, melody perception, melody recognition, cerebral hemodynamics

Clinical study

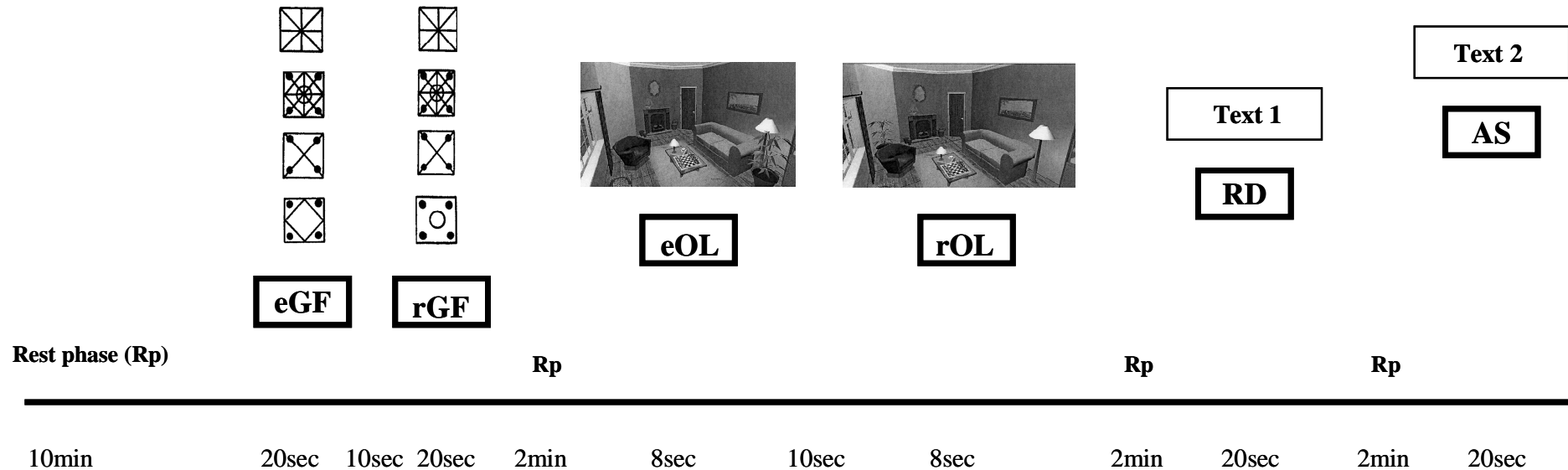
Music and cerebral hemodynamics

M. Marinoni, Enrico Grassi, S. Latorraca, A. Caruso, S. Sorbi

Neurosonology Laboratory, Department of Neurological and Psychiatric Sciences, University of Florence, Florence, Italy



Cerebral Hemodynamic Lateralization During Memory Tasks As Assessed By Functional Transcranial Doppler Sonography: Effects Of Gender And Healthy Aging Cortex, in press



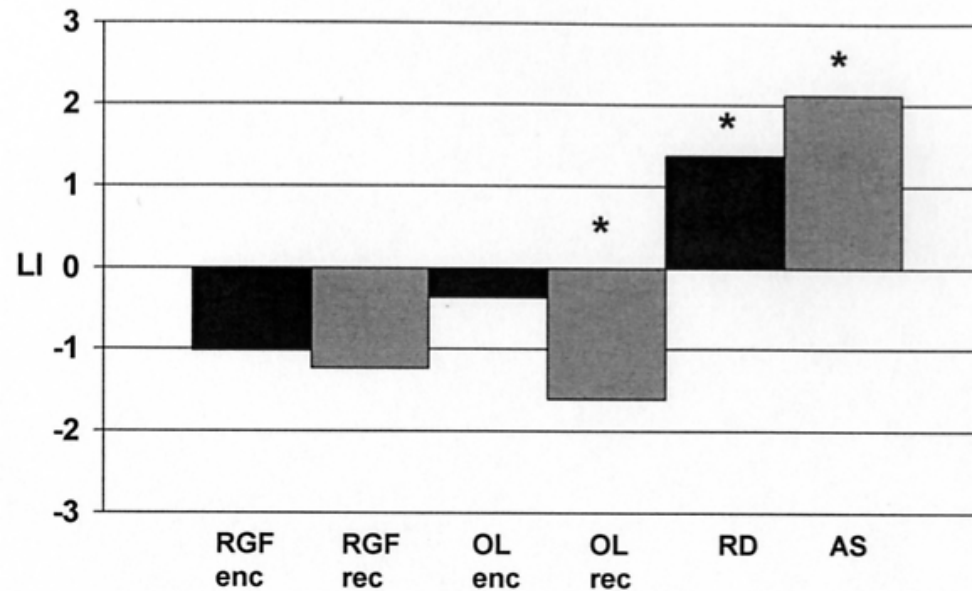
Text 1: The dining room was a large room, with dark wood paneling all sides. A massive fireplace with a huge mirror above was in the right corner; in front of it there were three carved chairs covered in red damask. An oval crystal tray with small gold ornaments on both handles sat on a bright and heavy table, in the middle of the room.

Text 2: 1) A bartender prepares two cups of coffee in 31 seconds. How many seconds does he need to prepare a dozen?
2) A sweater costs 60 euros, its price is reduced by 15% on sale. How much does it cost now?

Popolazione di studio: 70 volontari sani
35 M 35 F 21-40 anni (n=35) 41-60 anni (n=35)

Cerebral Hemodynamic Lateralization During Memory Tasks As Assessed By Functional Transcranial Doppler Sonography: Effects Of Gender And Healthy Aging Cortex, in press

Risultati: Indici di Lateralizzazione



Il task “localizzazione di oggetti OL” lateralizza a destra (compito preval visivo)

Il task “descrizione di ambienti RD” lateralizza a sinistra (compito preval. semantico)

Conclusioni (1)

Attivazione DX

Attivazione SX

Test
Geometrico

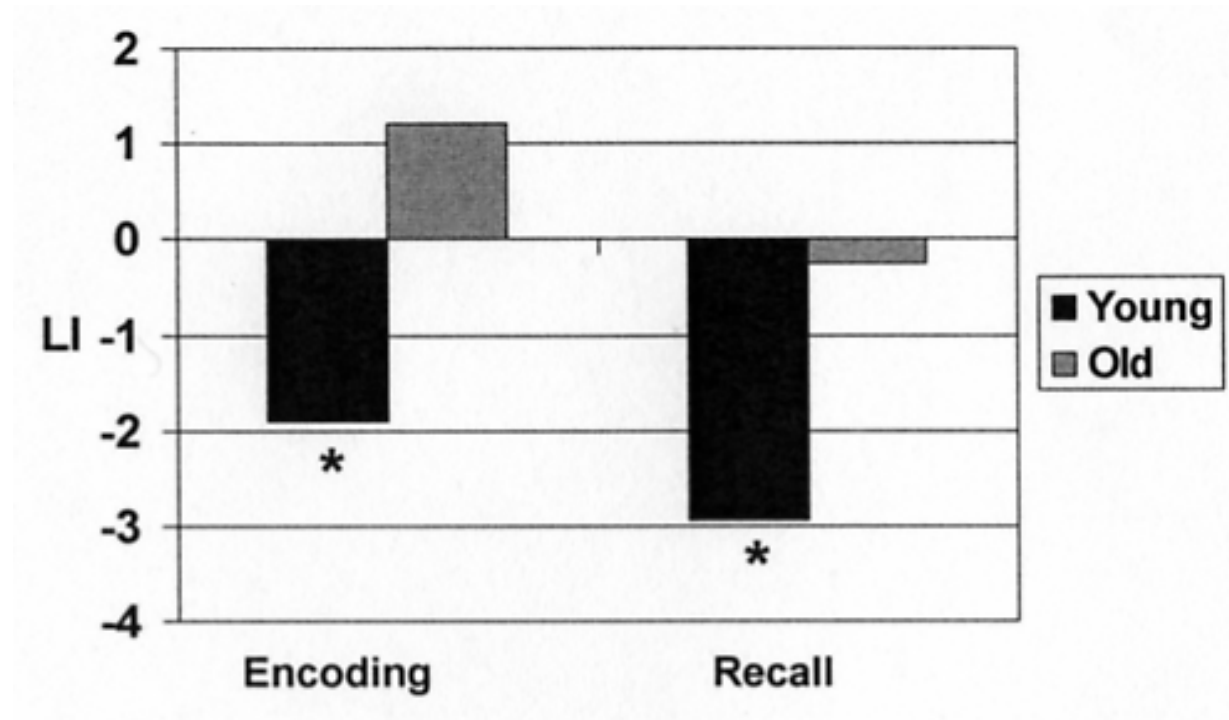
Test di
memoria
visuospaziale

Test di
memoria
verbale

Test
Matematico

Cerebral Hemodynamic Lateralization During Memory Tasks As Assessed By Functional Transcranial Doppler Sonography: Effects Of Gender And Healthy Aging Cortex, in press

Localizzazione di oggetti (OL)



Stesso livello di prestazione nei due gruppi

I giovani lateralizzano a destra (compito visuospatiale)

I non giovani, a parità di prestazione, si attivano bilateralmente (compito visuospatiale e verbale)

Cerebral Hemodynamic Lateralization During Memory Tasks As Assessed By Functional Transcranial Doppler Sonography: Effects Of Gender And Healthy Aging Cortex, in press



utilizzo da parte dei meno giovani di un meccanismo di compenso attraverso l'utilizzo di circuiti normalmente non coinvolti

Conclusioni

Benchè notoriamente la performance cognitiva si riduca all'aumentare dell'età, la performance viene raggiunta con una differente allocazione delle risorse

Riserva Cognitiva

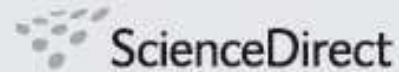
Capacità di far fronte all'invecchiamento neuronale e al danno cerebrale riducendo l'entità della compromissione cognitiva (*Stern et al., 2002*)

- Determinata sia geneticamente che da processi acquisiti
- Attinente a fenomeni cerebrali (densità sinaptica) e cognitivi (capacità di utilizzare strategie cognitive alternative)
- Correlata al livello di scolarità, all'occupazione, all'intelligenza premorbosa, alle attività del tempo libero



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Special issue: Research report

Age differences in prefrontal recruitment during verbal working memory maintenance depend on memory load

Katherine A. Cappell, Leon Gmeindl and Patricia A. Reuter-Lorenz*

Department of Psychology, University of Michigan, East Hall, Ann Arbor, MI, USA

Con l'aumentare dell'età si attua una riorganizzazione e redistribuzione delle risorse neuronali

CRUNCH Compensation-Related Utilization Of Neural Circuits Hypothesis