Meeting Highlights

Human Brain Mapping 2007

Peter A. Bandettini

OHBM 2007

- The Planning
- The Themes
- The Highlights

OHBM 2007

- The Planning
- The Themes
- The Highlights

Program Committee 2007

Chair	Christian Buechel
Chair-Elect	Keith Worsley
Past Chair	Maurizio Corbetta
Members	Tom Nichols Chair Education Subcommittee Paul Fletcher Andreas Kleinschmidt Riitta Salmelin Jean-Baptiste Poline Gian Luca Romani Vincent Clark Julien Doyon
Ex-Officio Members	Rainer Goebel John Mazziotta Peter Bandettini Marsel Mesulam Pietro Pietrini Gary Egan

Local Organizing Committee 2007

Chair	Marsel Mesulam Todd Parish Darren Gitelman Ken Paller Paul Reber Cindy Thompson Steve Small Jia-Hong Gao Vania Apkarian Keith Thulborn

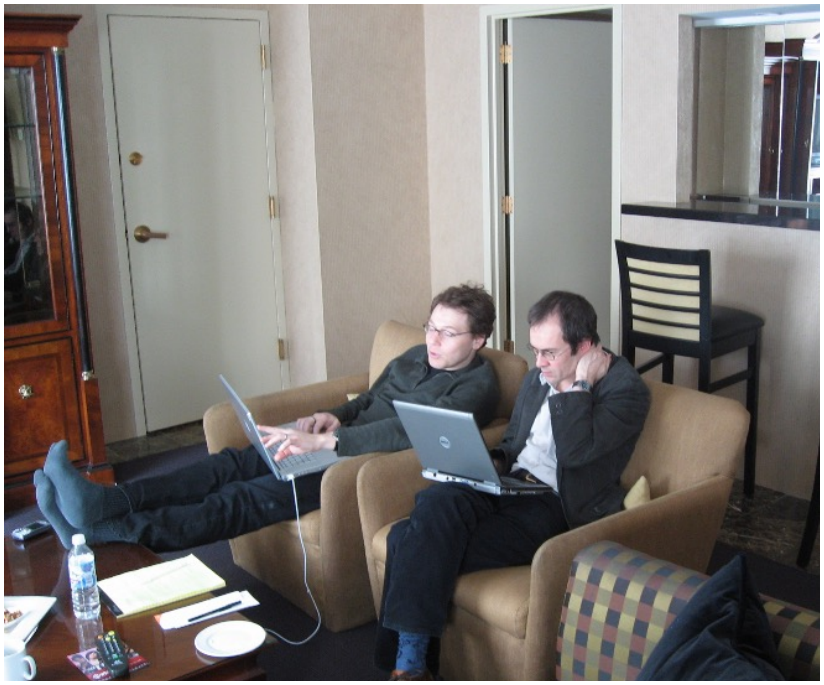
First Program Committee Meeting (Florence)

Julien Doyon John Mazziotta Keith Worsley Peter Bandettini Vince Clark

Jia-Hong Gao Gian Luca Romani Lori Anderson Tom Nichols Julie Ratzloff Christian Buechel Riitta Salmelin

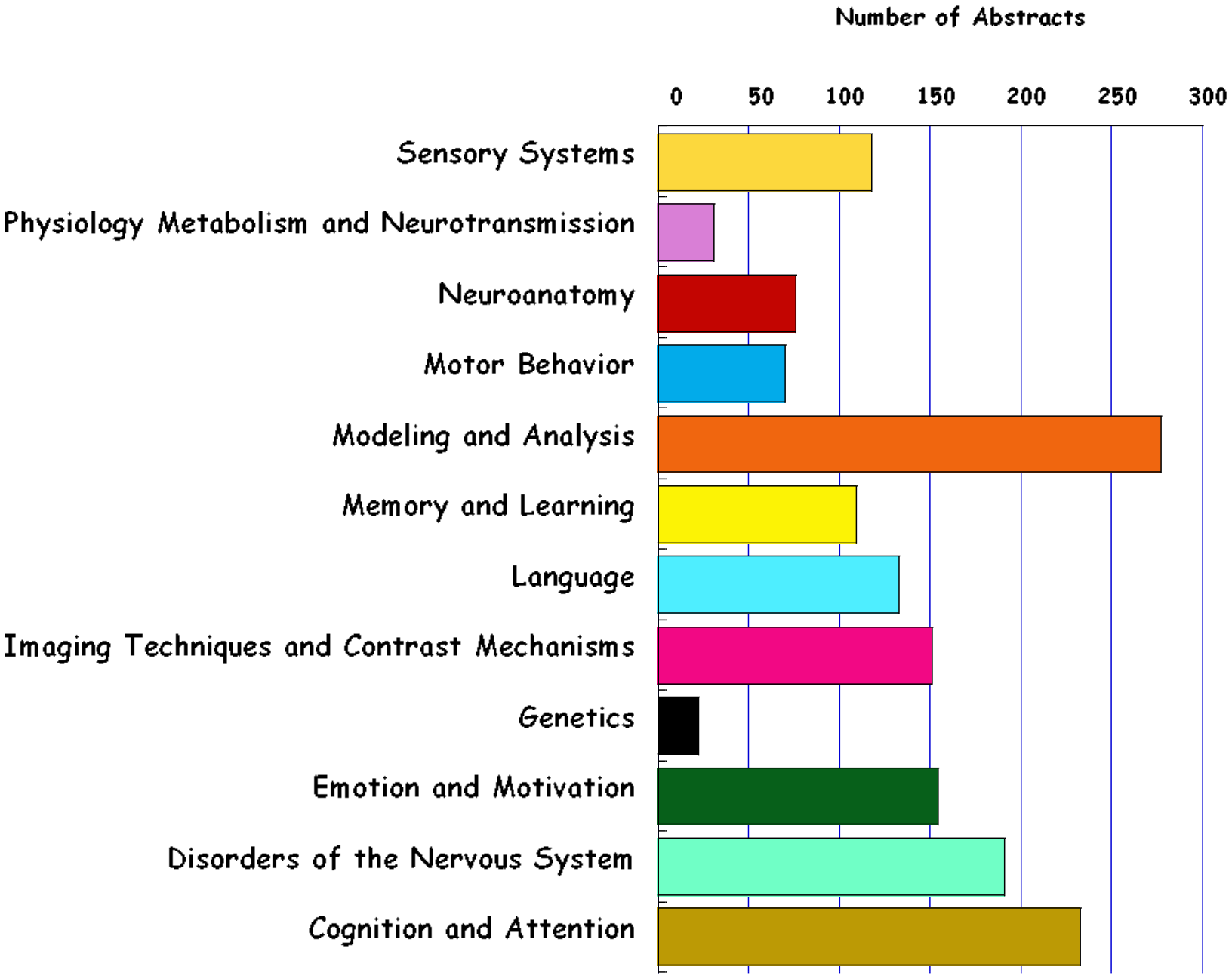
Marsel Mesulam Andreas Kleinschmidt Maurizio Corbetta Pietro Pietrini Cheryl Grady Jean-Baptiste Poline

Third Program Committee Meeting (Chicago)



OHBM 2007

- The Planning
- The Themes
- The Highlights


Number of Abstracts
0
50
100
150
200
250
300
Sensory Systems
Physiology Metabolism and Neurotransmission
Neuroanatomy
Motor Behavior
Modeling and Analysis
Memory and Learning
Language
Imaging Techniques and Contrast Mechanisms
Genetics
Emotion and Motivation
Disorders of the Nervous System
Cognition and Attention

Most popular sub-categories

Cognition and Attention	
-Executive Function	67
-Perception, imagery, awareness	53
-Attention (visual)	41
Emotion and Motivation	
-Emotional perception	66
Language	
-Comprehension	54
Modeling and Analysis	
-Functional connectivity	54
-Multivariate modeling, PCA,ICA	49
-Exploratory methods, artifact removal	41
Imaging Techniques	
-Functional MRI	49
Neuroanatomy	
-Anatomical Studies	48

Other indicators of major themes this year

Course Pre-Registrants:

Basic fMRI	45
Advanced fMRI	113
MEG/EEG	36
Cognitive Neuroscience	36
Structural Brain Mapping	72
Clinical fMRI	35

Other categories that caught my attention

Classification, prediction
Individual clinical assessment
Resting state
Default mode
Multimodal integration

OHBM 2007

- The Planning
- The Themes
- The Highlights

My approach to this

- Ask for summary slide from authors of the top 65 abstracts.
- During the meeting, determine what gets my attention.
- Ask my colleagues to keep their eyes open.
- Take a few pictures.

SUNDAY JUNE 10	MONDAY JUNE 11	TUESDAY JUNE 12	WEDNESDAY JUNE 13	THURSDAY JUNE 14
Educational Courses				
Basic fMRI Course 8:00-17:30 / Advanced fMRI Course 8:30-18:00 / Advanced MEG/EEG Course 8:00-18:00 / Cognitive Neuroscience Course 8:00-17:30 / Structural Brain Mapping Course 8:00-17:30	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15
	LOC SYMPOSIUM 9:30-10:45	ORAL SESSIONS Imaging Techniques; Genetics; Disorders of the Nervous System 9:30-10:45	ORAL SESSIONS Imaging Techniques; Emotion and Motivation; Disorders of the Nervous System 9:30-10:45	ORAL SESSIONS Imaging Techniques; Cognition; Neuroanatomy 9:30-10:45
	KEYNOTE - Larry Squire 11:00-11:30	KEYNOTE - Mitsuo Kawato 11:00-11:30	KEYNOTE - Gary Glover 11:00-11:30	KEYNOTE - Maurizio Corbetta 11:00-11:30
	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30
	LUNCH 12:30-13:45	LUNCH 12:30-13:45	LUNCH 12:30-13:45	LUNCH 12:30-13:45
	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45
	SYMPOSIUM: Mapping Genetic Influences on Human Brain Structure and Function 15:00-16:15	SYMPOSIUM: A Multi-Level Perspective on the Neural Correlates of Perceptual Decision Making 15:00-16:15	SYMPOSIUM: Repetition and the Brain: From Neurons to Computational Models Using Multimodal Approaches 15:00-16:15	ORAL SESSIONS Modeling and Analysis; Cognition; Senory Systems 15:00-16:15
	KEYNOTE - Brian Wandell 16:30-17:00	TOWN HALL MEETING 16:30 -17:00	KEYNOTE - Willem Levelt 16:30-17:00	MEETING HIGHLIGHTS: Peter Bandettini, Past Chair 16:30 - 17:30
	ORAL SESSIONS Modeling and Analysis; Memory; Disorders of the Nervous System 17:00 -18:15	KEYNOTE - Leah Krubitzer 17:00-17:30	ORAL SESSIONS Modeling and Analysis; Emotion and Motivation; Language 17:00 -18:15	FAREWELL RECEPTION 17:30-18:30
OPENING CEREMONIES 18:30	POSTER RECEPTION 18:30-19:30	ORAL SESSIONS Modeling and Analysis; Cognition; Motor Behavior 17:30 -18:45	POSTER RECEPTION 18:30-19:30	
TALAIRACH LECTURE Daniel Kahneman		POSTER RECEPTION 19:00-20:00		
WELCOME RECEPTION 19:30			CLUB NIGHT 21:00	

Bernard Mazoyer

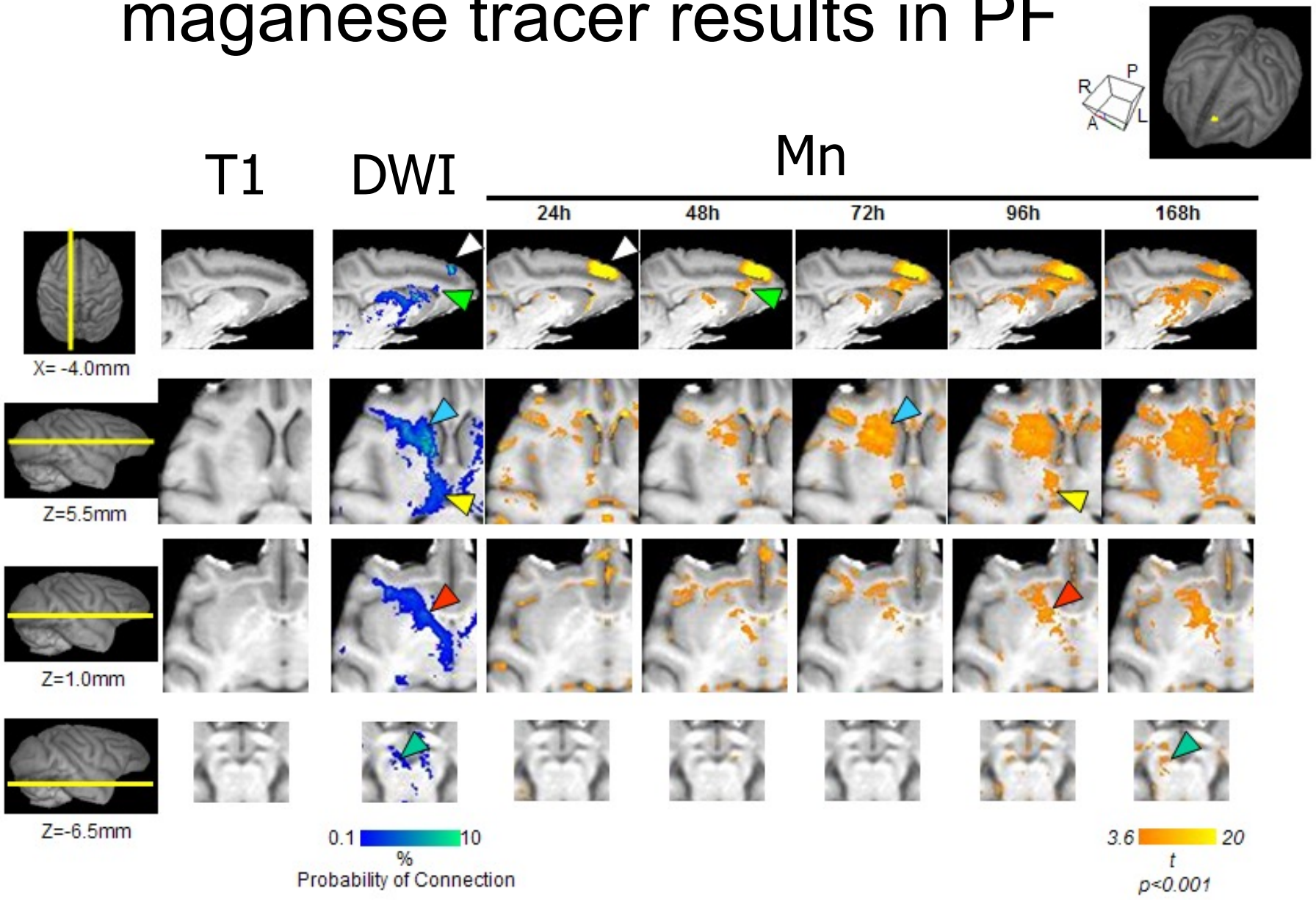
Dan Kahneman

SUNDAY JUNE 10	MONDAY JUNE 11	TUESDAY JUNE 12	WEDNESDAY JUNE 13	THURSDAY JUNE 14
Educational Courses				
Basic fMRI Course 8:00-17:30 Advanced fMRI Course 8:30-18:00 Advanced MEG/EEG Course 8:00-18:00 Cognitive Neuroscience Course 8:00-17:30 Structural Brain Mapping Course 8:00-17:30	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15
	LOC SYMPOSIUM 9:30-10:45	ORAL SESSIONS Imaging Techniques; Genetics; Disorders of the Nervous System 9:30-10:45	ORAL SESSIONS Imaging Techniques; Emotion and Motivation; Disorders of the Nervous System 9:30-10:45	ORAL SESSIONS Imaging Techniques; Cognition; Neuroanatomy 9:30-10:45
	KEYNOTE - Larry Squire 11:00-11:30	KEYNOTE - Mitsuo Kawato 11:00-11:30	KEYNOTE - Gary Glover 11:00-11:30	KEYNOTE - Maurizio Corbetta 11:00-11:30
	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30
	LUNCH 12:30-13:45	LUNCH 12:30-13:45	LUNCH 12:30-13:45	LUNCH 12:30-13:45
	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45
	SYMPOSIUM: Mapping Genetic Influences on Human Brain Structure and Function 15:00-16:15	SYMPOSIUM: A Multi-Level Perspective on the Neural Correlates of Perceptual Decision Making 15:00-16:15	SYMPOSIUM: Repetition and the Brain: From Neurons to Computational Models Using Multimodal Approaches 15:00-16:15	ORAL SESSIONS Modeling and Analysis; Cognition; Senory Systems 15:00-16:15
	KEYNOTE - Brian Wandell 16:30-17:00	TOWN HALL MEETING 16:30 -17:00	KEYNOTE - Willem Levelt 16:30-17:00	MEETING HIGHLIGHTS: Peter Bandettini, Past Chair 16:30 - 17:30
	ORAL SESSIONS Modeling and Analysis; Memory; Disorders of the Nervous System 17:00 -18:15	KEYNOTE - Leah Krubitzer 17:00-17:30 ORAL SESSIONS Modeling and Analysis; Cognition; Motor Behavior 17:30 -18:45	ORAL SESSIONS Modeling and Analysis; Emotion and Motivation; Language 17:00 -18:15	FAREWELL RECEPTION 17:30-18:30
OPENING CEREMONIES 18:30	POSTER RECEPTION 18:30-19:30	POSTER RECEPTION 19:00-20:00	POSTER RECEPTION 18:30-19:30	
TALAIRACH LECTURE Daniel Kahneman				
WELCOME RECEPTION 19:30			CLUB NIGHT 21:00	

LOC Symposium: Imaging the Structural Connectivity of the Cerebral Cortex

Jeremy Schmahmann, MGH
Heidi Johansen-Berg, Oxford
Marco Catani, UCL

Validation of tractography: Comparison with maganese tracer results in PF

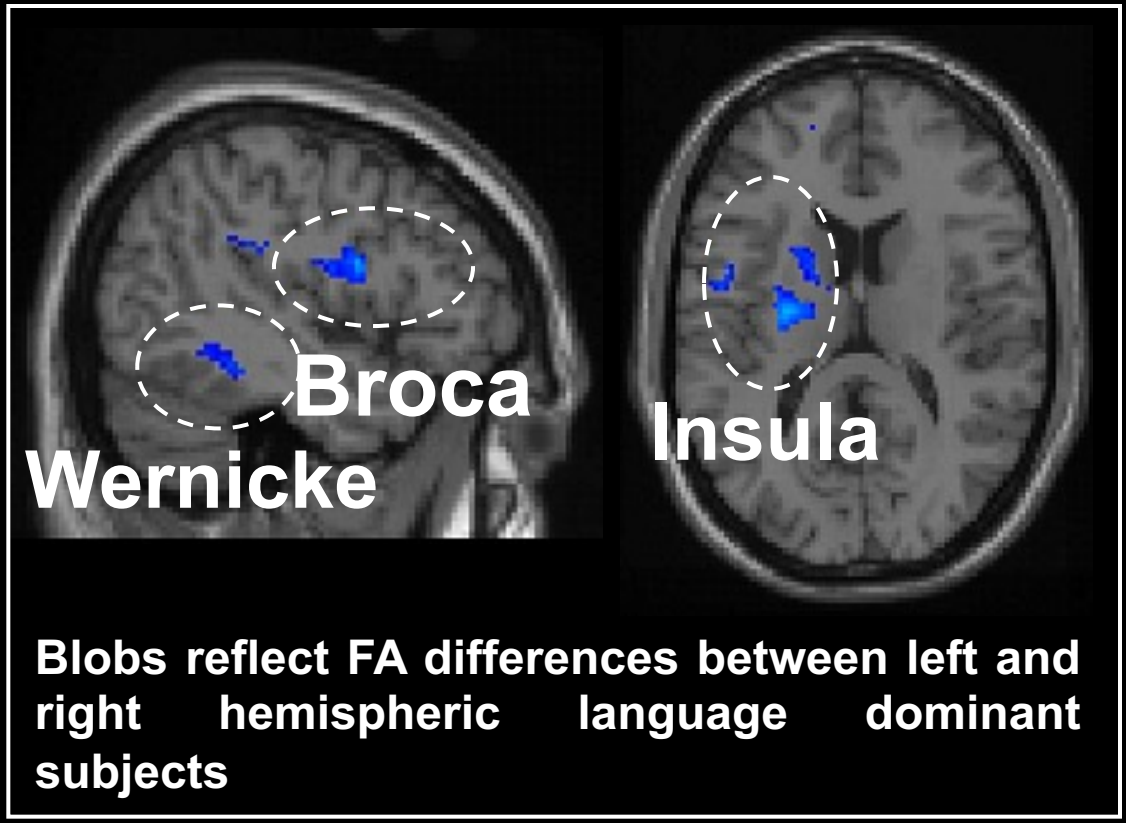


Hayashi et al. Society for Neuroscience, Atlanta 2006

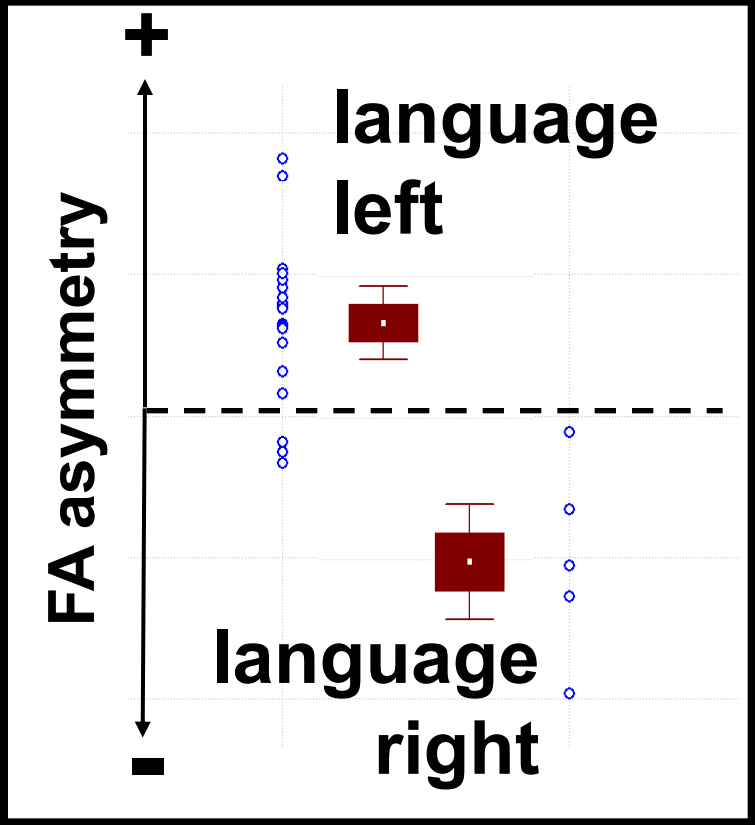
Anatomical correlates of right-hemispheric language processing: A DTI study

Monday – AM

S Mohammadi, A Jansen, W Schwindt, S Knecht, M Deppe
University of Münster, Germany



Blobs reflect FA differences between left and right hemispheric language dominant subjects



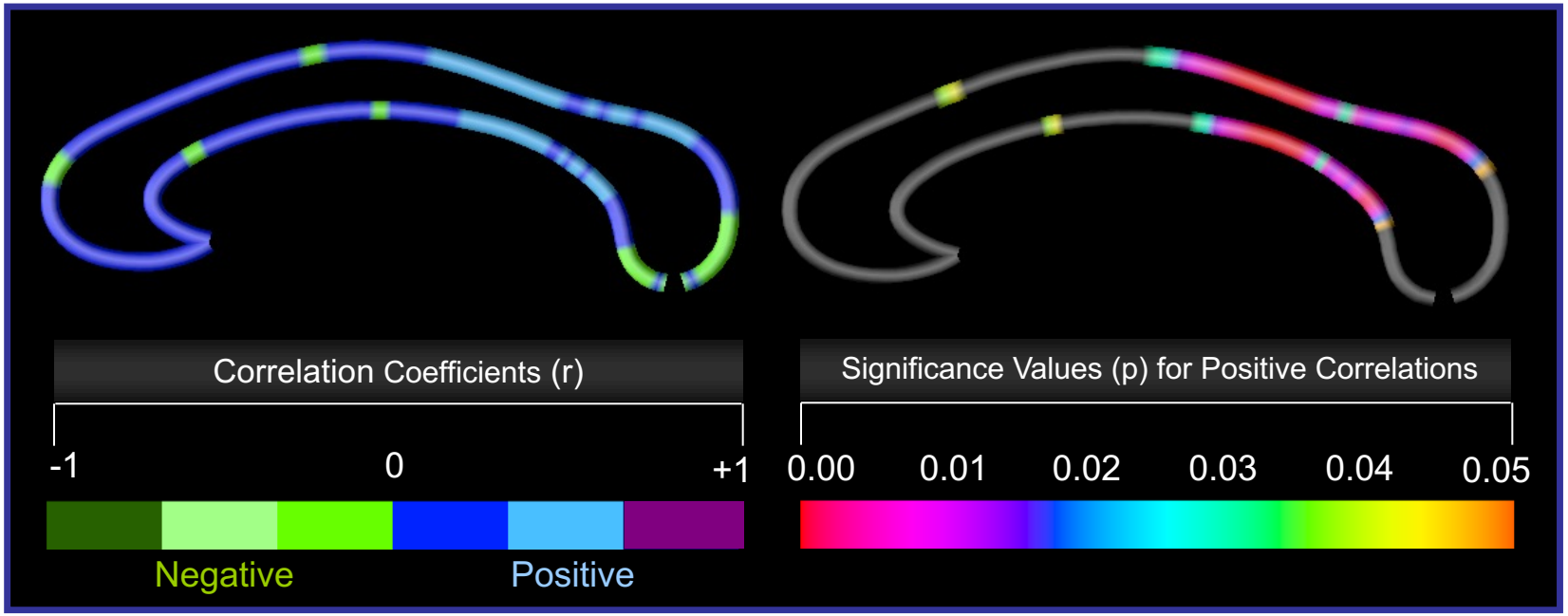
Results: language dominance was predicted by hemispheric FA asymmetry

Does callosal thickness correlate with intelligence?

(1) Intelligence and callosal thickness are correlated.

(2) Only positive correlations are significant.

(3) Positive correlations are most pronounced in the posterior half of the corpus callosum.



Luders, Narr, Bilder, Thompson, Szeszko, Hamilton, Gurbani, Toga

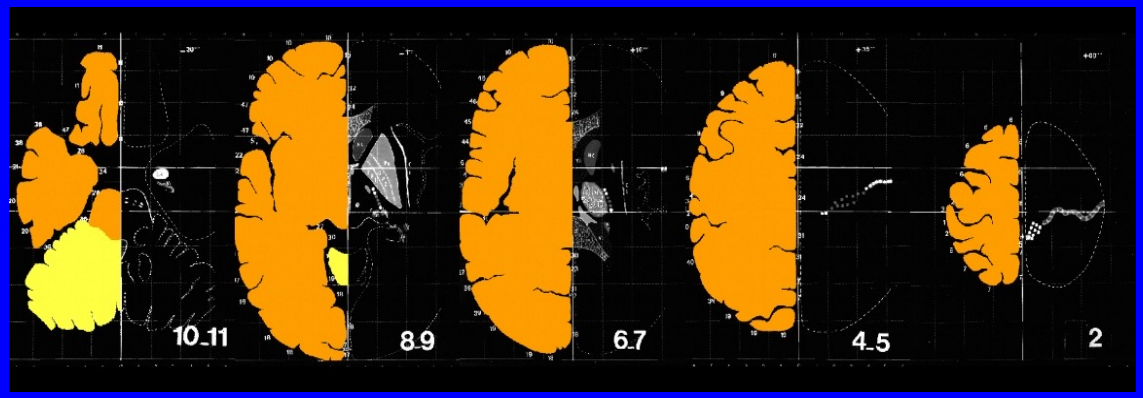
Poster #344; M-PM

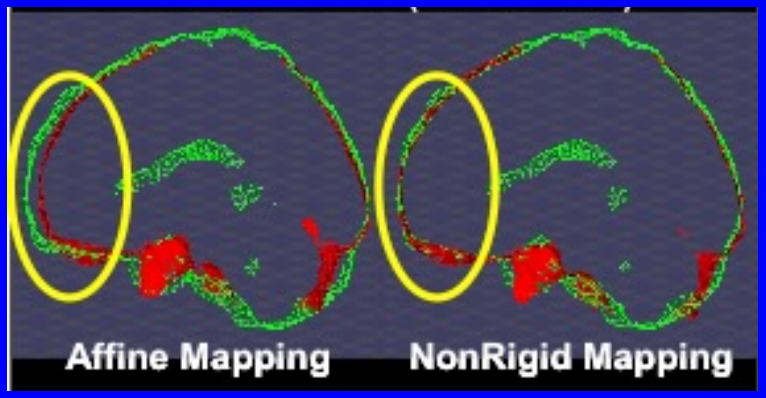
Poster # 353 presented on Monday morning

More Accurate Talairach Coordinates for NeuroImaging

Cheryl M. Lacadie[1], Robert K. Fulbright[1], R. Todd Constable[1,2], Xenophon Papademetris[1,2]

[1]Department of Diagnostic Radiology and [2]Biomedical Engineering, Yale University





MNI to Talairach Coordinate Converter

0 0 0 Yale Nonlinear MNI -> TAL 0 -2 3

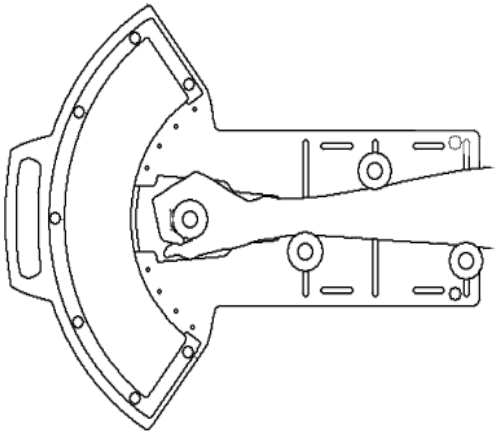
Part of BioImage Suite software. Also java applet available online at www.bioimagesuite.org

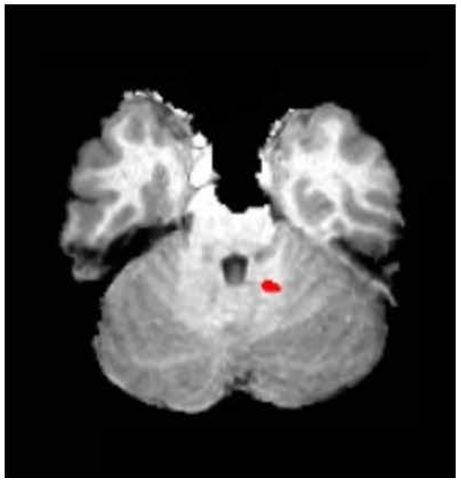
- Created a 3D Talairach brain surface by scanning the original atlas and stacking and segmenting the slices.
- Non-linearly registered this surface to MNI template outer brain surface to compute a true non-linear MNI2TAL registration

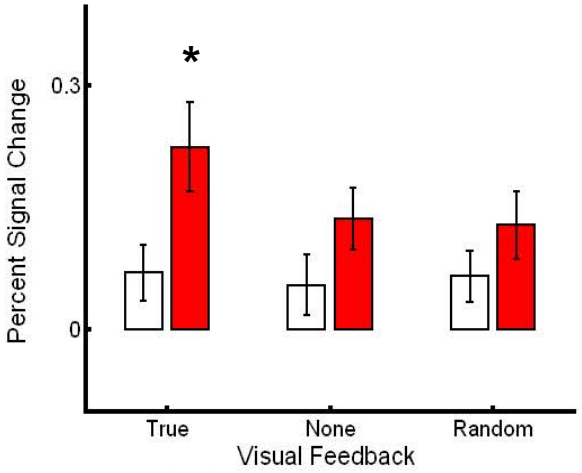
Cerebellar and posterior parietal involvement in the integration of visual and proprioceptive feedback during stabilization of the wrist

A.J. Suminski[1], S.M. Rao[2], and R.A. Scheidt[1]

[1]Marquette Univ., Milwaukee, WI; [2]Medl College of Wisconsin, Milwaukee, WI







Activation in the ipsilateral dentate nucleus is ***enhanced*** when visual and proprioceptive feedback are ***correlated*** in time.

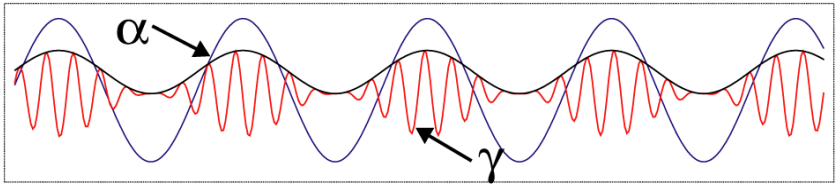
Reflective of it's role in ***integrating multiple sensory and feedforward estimates of limb state*** thereby producing a unified limb state estimate that can be used to correct for movement errors.

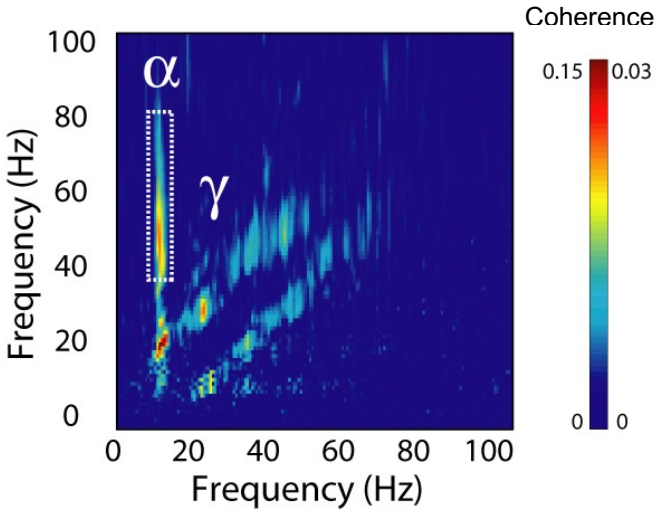
Supported by NSF BES0238442

Gamma power is phase-locked to posterior alpha activity

Daria Osipova, Ali Mazaheri, Ole Jensen

F.C. Donders Centre for Cognitive Neuroimaging, Nijmegen, the Netherlands





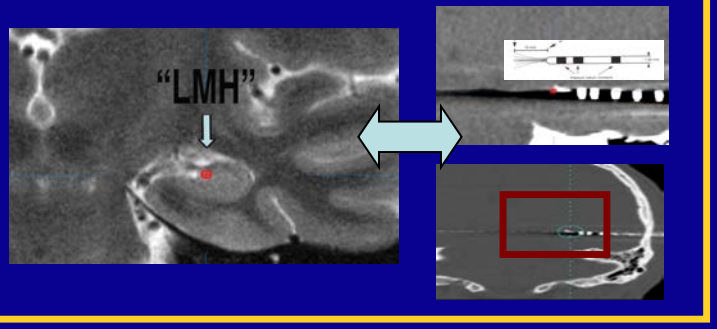
This finding suggests that visual processing reflected by gamma activity (40-100 Hz) is chunked in time determined by the alpha (8-13 Hz) phase.

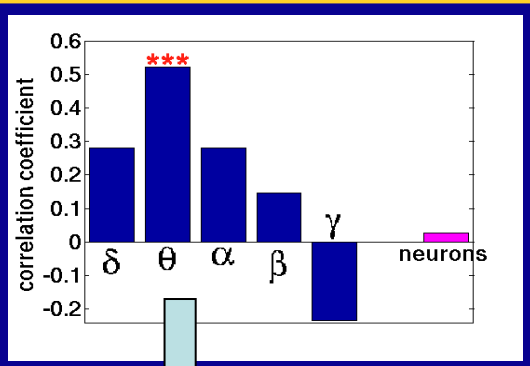
Poster # 37, Monday morning

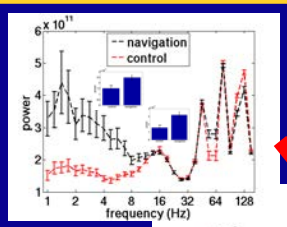
Electrophysiological Recordings and High-Resolution Imaging of Human Hippocampus Reveal Couplings between BOLD Activations, Local Field Potentials, and Cellular Firing Rate

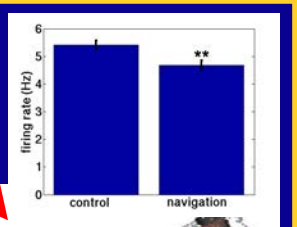
Arne Ekstrom, Nanthia Suthana, Itzhak Fried, and Susan Bookheimer
UCLA Center For Cognitive Neuroscience and Dept of Neurosurgery

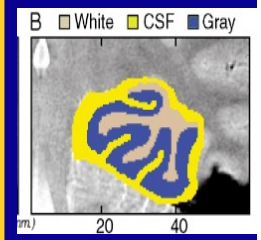
#179 Mon.-PM Memory Session

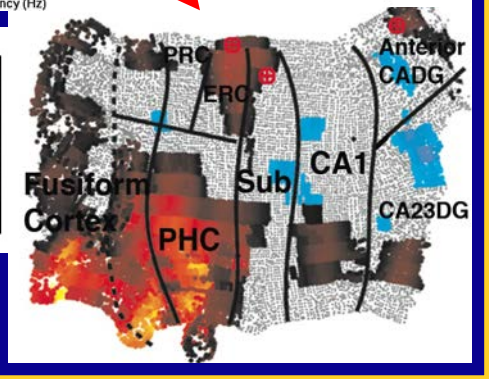




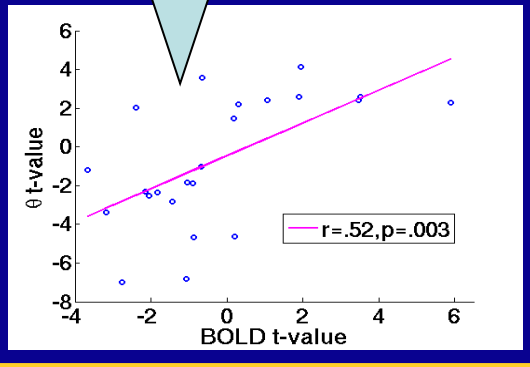




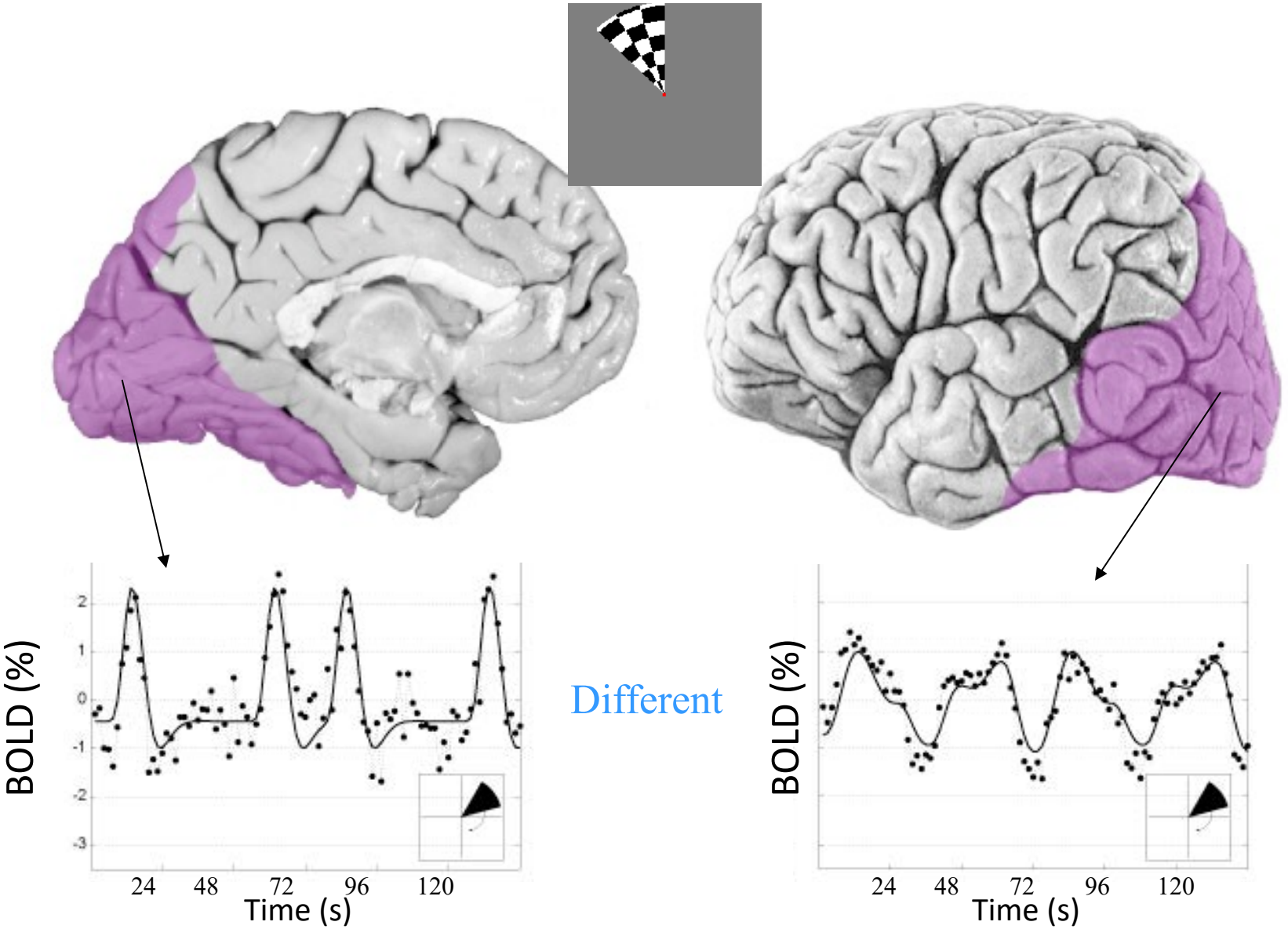




Magnitude of Hippocampal BOLD Activation Correlates With θ Oscillations



Keynote: Brain Wandell

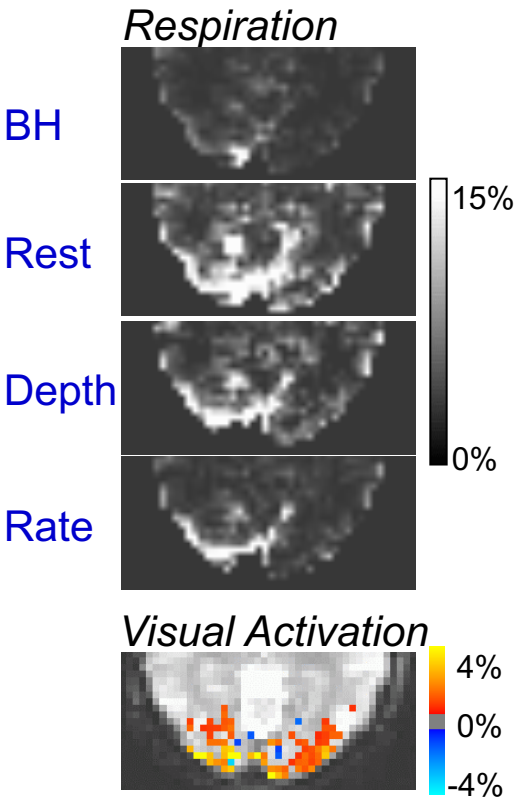


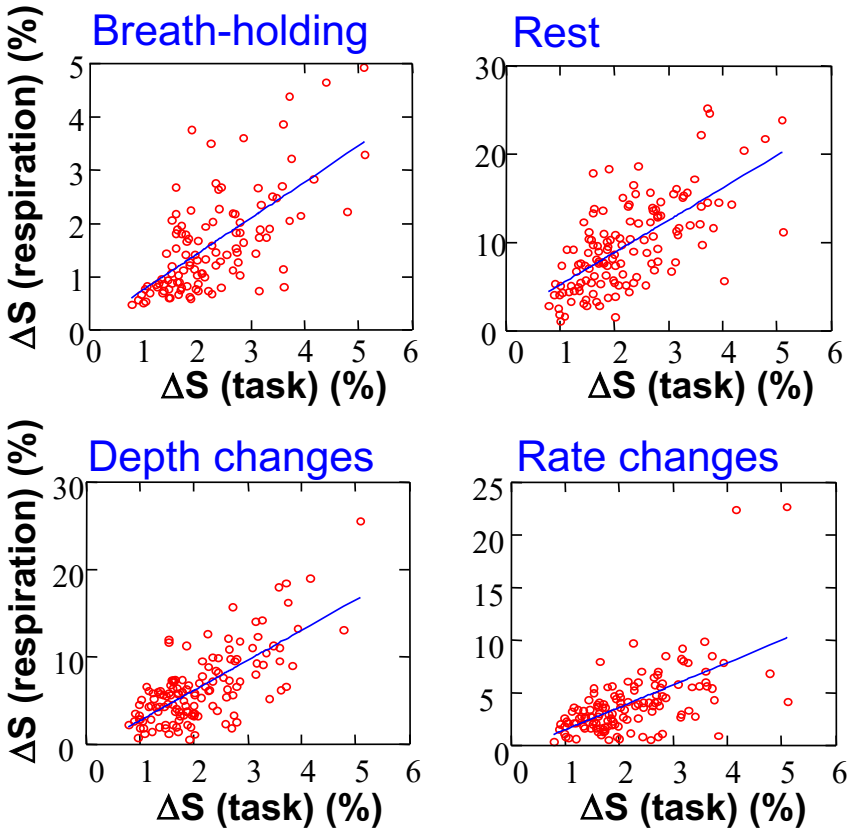
Calibration of BOLD fMRI signal changes using cued and spontaneous breathing variations

R.M. Birn, T.B. Jones, P.A. Bandettini

Section on Functional Imaging Methods, Lab of Brain and Cognition, NIMH, NIH

Correlation between Respiration-induced and BOLD signal changes

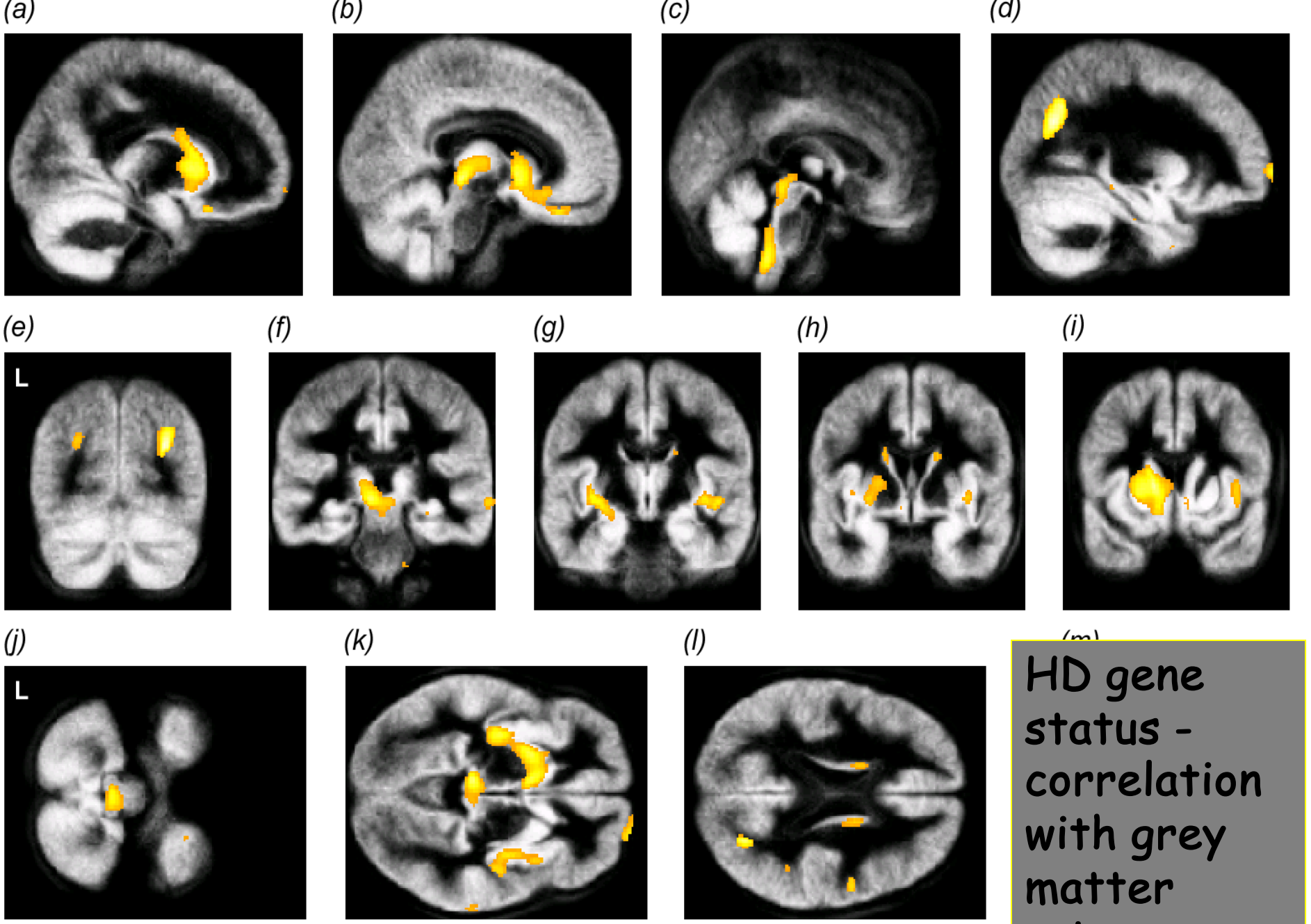




Talk # 787, Monday PM, (Poster #297)

Symposium: Mapping Genetic Influences on Human Brain Structure and Function

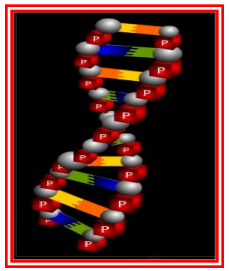
Richard Frackowiak, UCL
Daniel Weinberger, NIMH
David Eidelberg, LIJ Health System

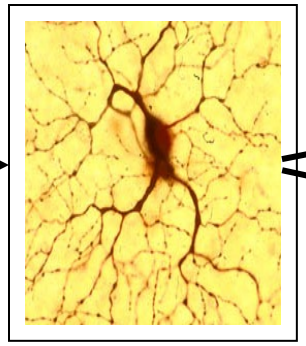


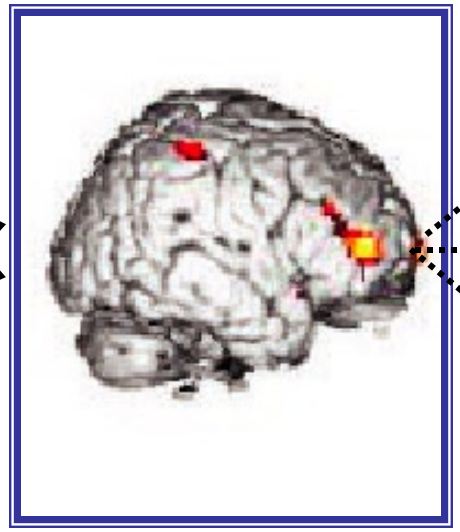
HD gene status - correlation with grey matter volume

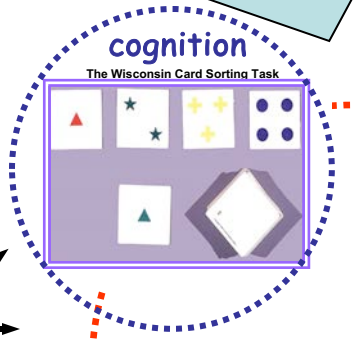
Structural biomarkers of preclinical disease

The path from here to there…









schizophrenia

temperament

Genes:

multiple susceptibility alleles each of small effect

Cells:

subtle molecular abnormalities

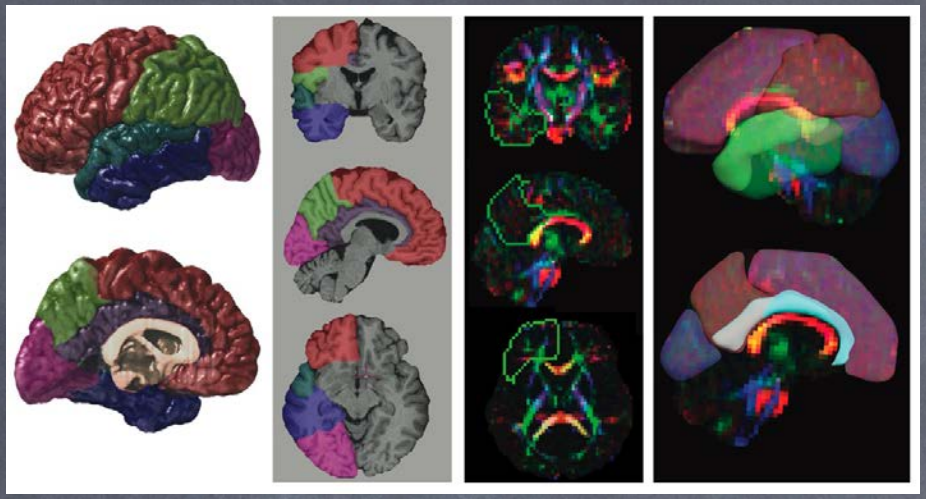
Systems:

abnormal information processing

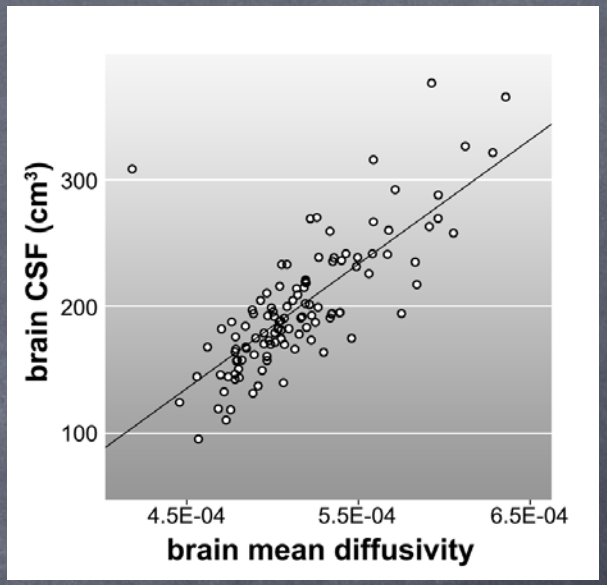
Behavior:

complex functional interactions and emergent phenomena

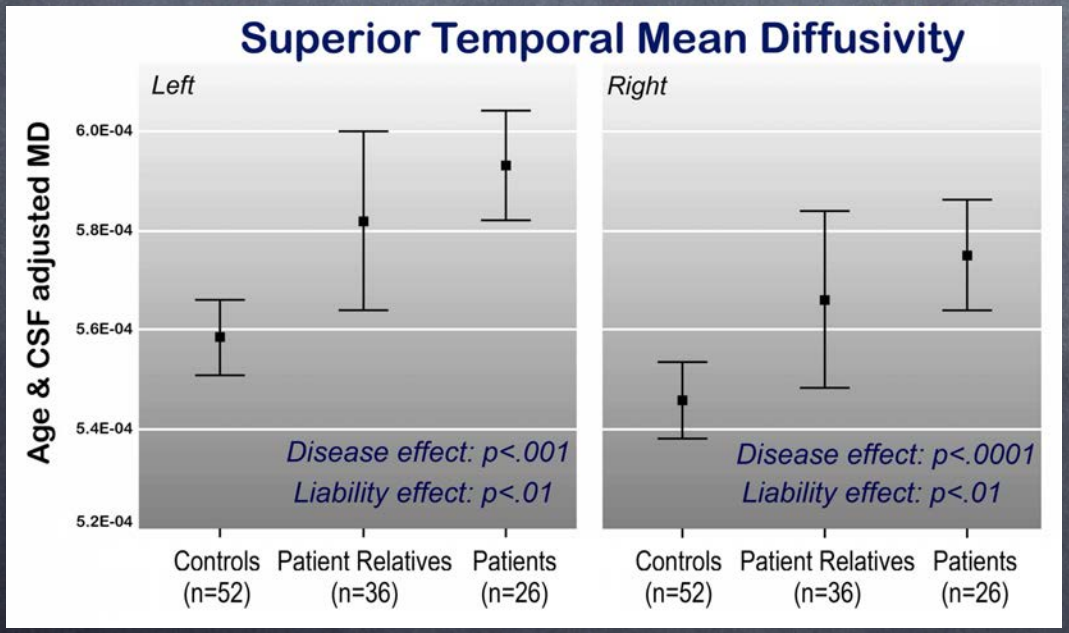
Mean diffusivity: A biomarker for CSF-related disease and genetic liability effects in schizophrenia



Mean diffusivity and CSF volume relationships, and disease and schizophrenia genetic liability effects were examined using a regions of interest approach applied to DTI and structural MR data.



Mean diffusivity and CSF volume are highly correlated, suggesting these measures reflect the same underlying pathophysiological processes in schizophrenia.



Mean diffusivity appears a sensitive biological marker of disease and genetic liability in schizophrenia that characterizes at least partially distinct aspects of brain structural integrity.

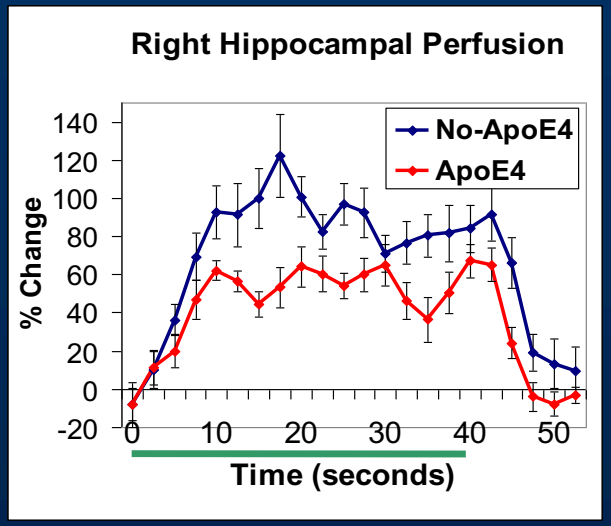
Narr, Hageman, Hamilton, Gurbani, Woods, Asarnow, Shattuck, Toga, Nuechterlein (Mon, PM)

Functional Perfusion and BOLD MRI in Alzheimer's Disease Genetic Risk

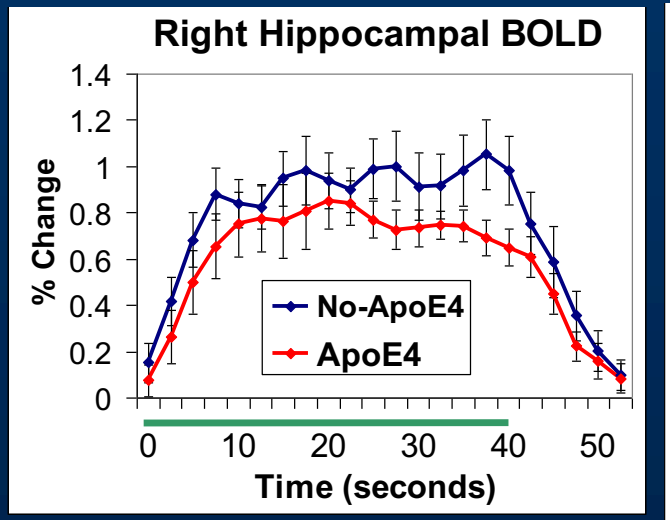
Adam Fleisher et al, UCSD

Poster #111 TH-AM Oral presentation: Monday pm: Memory

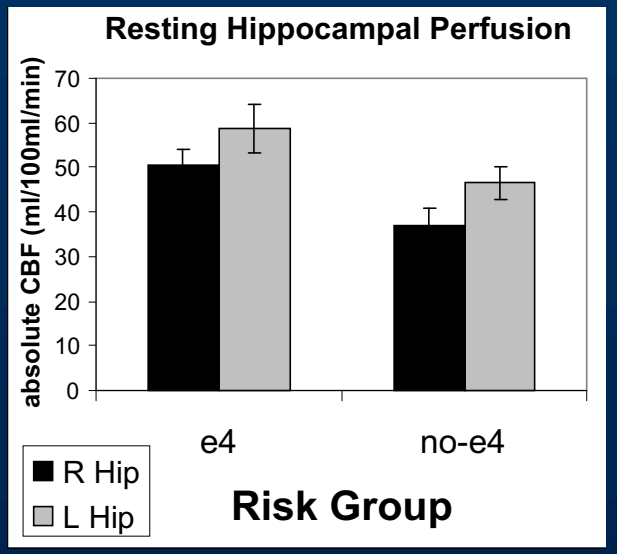
Activation Perfusion



Activation BOLD



Resting Perfusion state



Results:

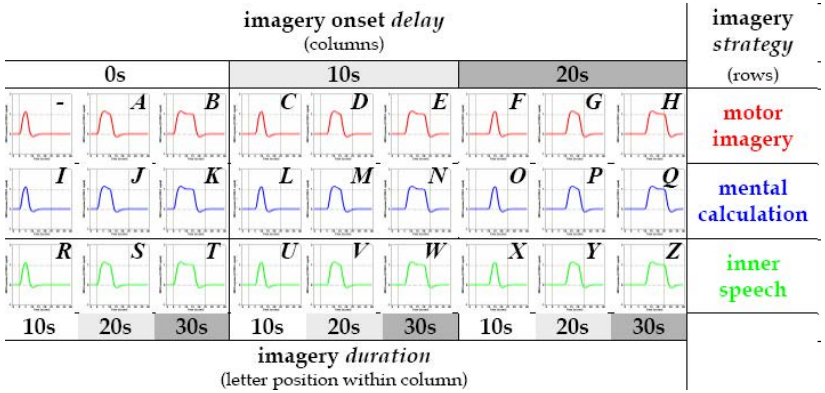
Decreased **BOLD** and **perfusion** signal activation in middle aged APOE4 carriers in the MTL during the memory task.

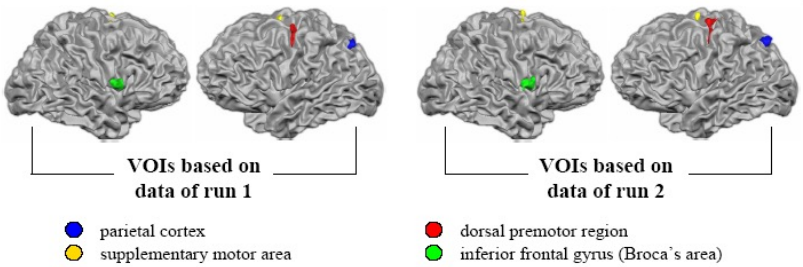
- APOE-e4 carriers had an elevated state of baseline perfusion which likely influences activation differences.

BOLD communication: When the brain speaks for itself

Bettina Sorger, Brigitte Dahmen, Joel Reithler, Rainer Goebel

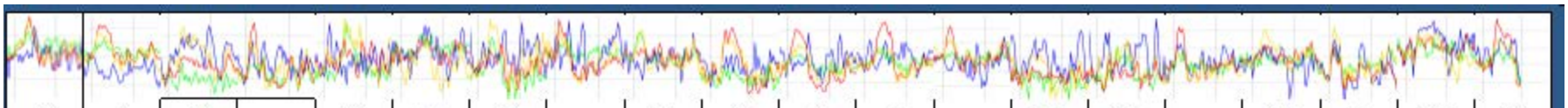
Cognitive Neuroscience Department, Maastricht University, The Netherlands
Maastricht Brain Imaging Center (M-BIC), Maastricht University, The Netherlands





	guided letter encoding				*phrase encoding*			
en-/ decoder	paradigm	delay	duration	letter	paradigm	delay	duration	letter
S1	.988	.981	.907	.889	.958	.986	.889	.840
S2	.938	.932	.870	.827	.784	.961	.804	.686
S3	.957	.981	.920	.883	.735	.931	.824	.608
R1	.966	.975	.932	.901	.869	.960	.869	.778
R2	.969	.957	.907	.877	.879	.990	.889	.788
R3	.944	.963	.858	.821	.800	.940	.798	.636
total	.961	.965	.899	.866	.852	.963	.852	.734

Fig. 3. Accuracy results of the *guided letter* and *phrase encoding* experiments (percentage of correct identification).



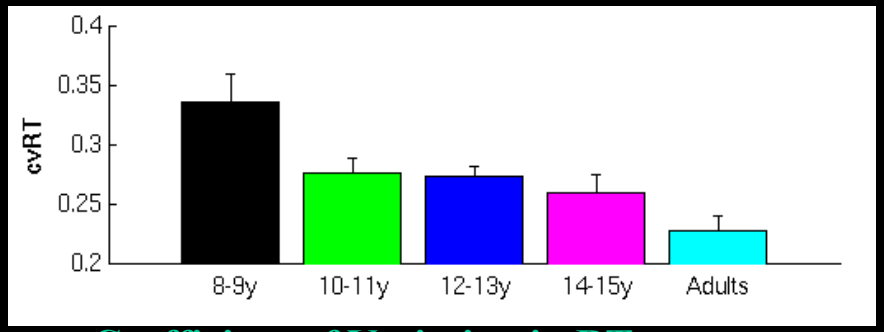
C	A	N	-	Y	O	U	-	R	E	A	D	-	M	Y	-	M	I	N	D
C/C/C	A/A/A	N/N/N	-/-/-	Y/Y/X	O/X/O	V/U/U	-/-/-	R/R/R	D/D/D	A/A/A	D/D/D	-/-/-	M/M/M	Y/Z/Y	-/-/-	M/M/U	I/I/I	N/N/N	D/D/D
C/C/C	A/A/A	N/N/N	-/-/-	Y/Y/Y	O/O/O	U/U/U	-/-/-	R/R/R	E/E/E	A/A/A	D/D/D	-/-/-	M/M/M	Y/Y/Y	-/-/-	M/M/M	I/I/I	N/N/N	D/D/D

Fig. 4. Results of the *phrase encoding* experiment (subject S1).
The first row displays the single-trial time courses of the four VOIs generated by the subject while encoding the letters indicated in the second row. The third (light-grey) row displays letter decoding results obtained independently by three raters (R1/R2/R3) evaluating the time courses in randomized trial order (without word context information), whereas the fourth (dark-grey) row illustrates the results obtained by using the original trial order (providing word context information).

SUNDAY JUNE 10	MONDAY JUNE 11	TUESDAY JUNE 12	WEDNESDAY JUNE 13	THURSDAY JUNE 14
Educational Courses				
Basic fMRI Course 8:00-17:30 Advanced fMRI Course 8:30-18:00 Advanced MEG/EEG Course 8:00-18:00 Cognitive Neuroscience Course 8:00-17:30 Structural Brain Mapping Course 8:00-17:30	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15
	LOC SYMPOSIUM 9:30-10:45	ORAL SESSIONS Imaging Techniques; Genetics; Disorders of the Nervous System 9:30-10:45	ORAL SESSIONS Imaging Techniques; Emotion and Motivation; Disorders of the Nervous System 9:30-10:45	ORAL SESSIONS Imaging Techniques; Cognition; Neuroanatomy 9:30-10:45
	KEYNOTE - Larry Squire 11:00-11:30	KEYNOTE - Mitsuo Kawato 11:00-11:30	KEYNOTE - Gary Glover 11:00-11:30	KEYNOTE - Maurizio Corbetta 11:00-11:30
	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30
	LUNCH 12:30-13:45	LUNCH 12:30-13:45	LUNCH 12:30-13:45	LUNCH 12:30-13:45
	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45
	SYMPOSIUM: Mapping Genetic Influences on Human Brain Structure and Function 15:00-16:15	SYMPOSIUM: A Multi-Level Perspective on the Neural Correlates of Perceptual Decision Making 15:00-16:15	SYMPOSIUM: Repetition and the Brain: From Neurons to Computational Models Using Multimodal Approaches 15:00-16:15	ORAL SESSIONS Modeling and Analysis; Cognition; Senory Systems 15:00-16:15
	KEYNOTE - Brian Wandell 16:30-17:00	TOWN HALL MEETING 16:30 -17:00	KEYNOTE - Willem Levelt 16:30-17:00	MEETING HIGHLIGHTS: Peter Bandettini, Past Chair 16:30 - 17:30
	ORAL SESSIONS Modeling and Analysis; Memory Disorders of the Nervous System 17:00 -18:15	KEYNOTE - Leah Krubitzer 17:00-17:30 ORAL SESSIONS Modeling and Analysis; Cognition; Motor Behavior 17:30 -18:45	ORAL SESSIONS Modeling and Analysis; Emotion and Motivation; Language 17:00 -18:15	FAREWELL RECEPTION 17:30-18:30
OPENING CEREMONIES 18:30	POSTER RECEPTION 18:30-19:30	POSTER RECEPTION 19:00-20:00	POSTER RECEPTION 18:30-19:30	
TALAIRACH LECTURE Daniel Kahneman				
WELCOME RECEPTION 19:30			CLUB NIGHT 21:00	

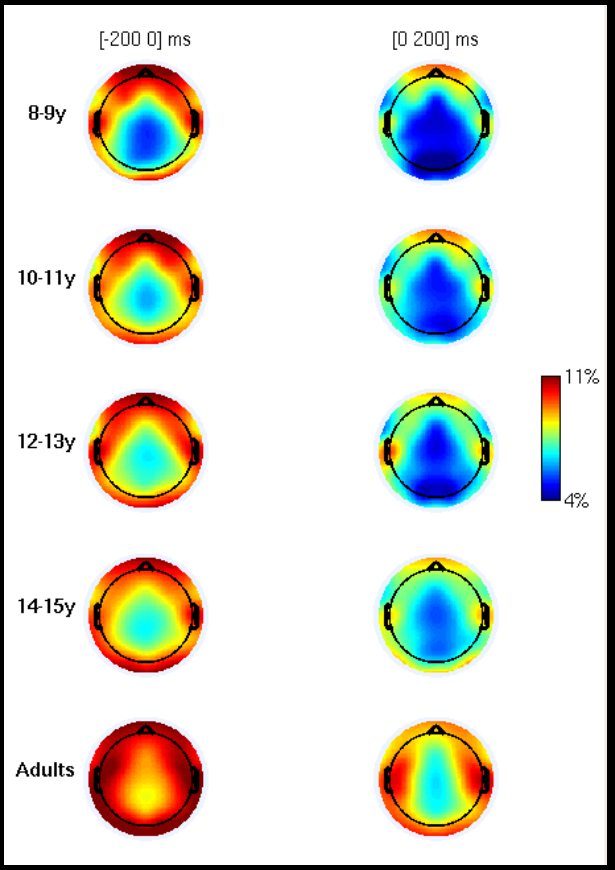
Maturational increase noise in single trial EEG data relates to behavior stabilisation

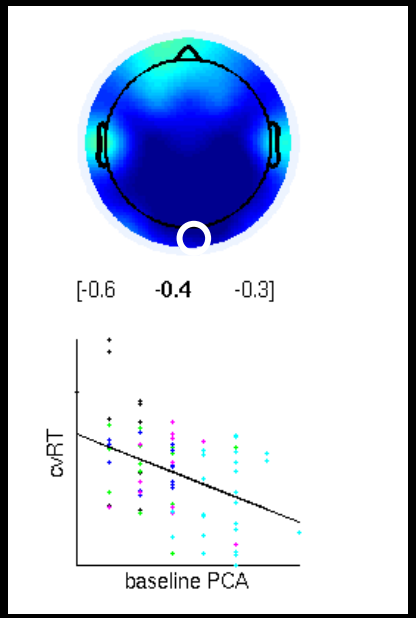
AR McIntosh



Coefficient of Variation in RT

Higher variabiity in children





Negative correlation of brain variability and behaviour variability

PCA dimensionality

Increased dimensionality (brain variability) with maturation

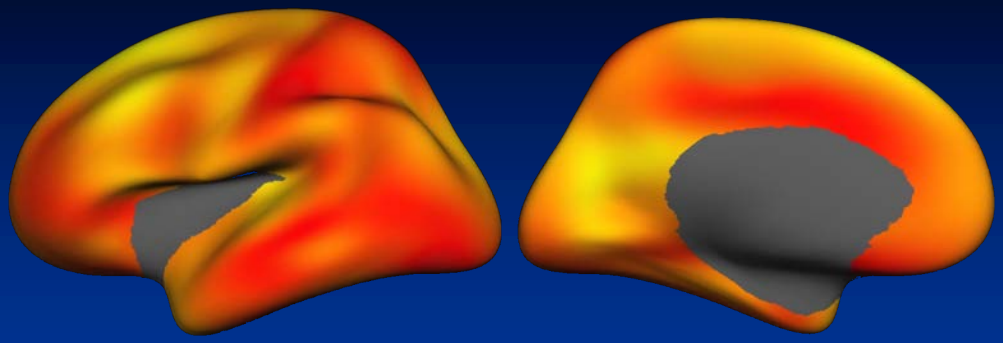
Brain Noise: The new *buzz:*

Breakspear, Jirsa, Harrison & McIntosh, Chair:Friston

The VETSA Study: Heritability of Cortical Thickness

Lars M. Rimol et al., UCSD

Oral presentation: Tuesday AM - 9:45

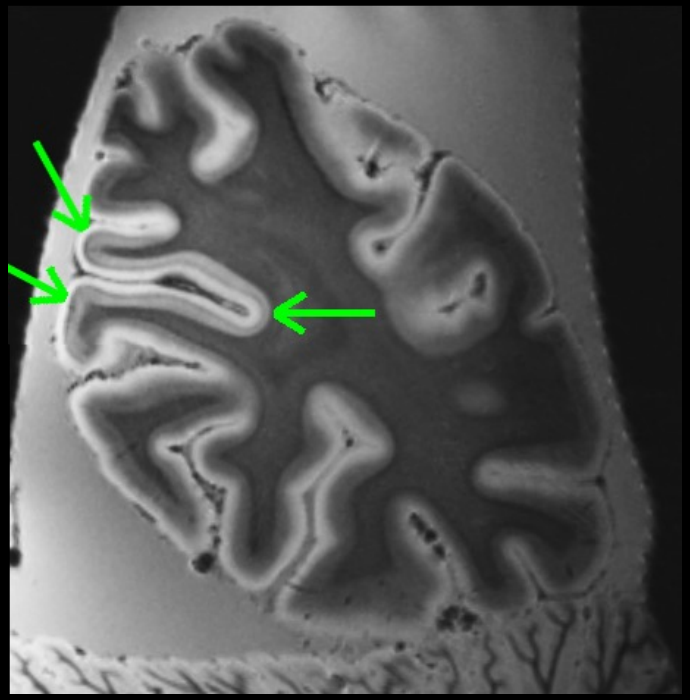


Lighter colors indicate higher heritabilities

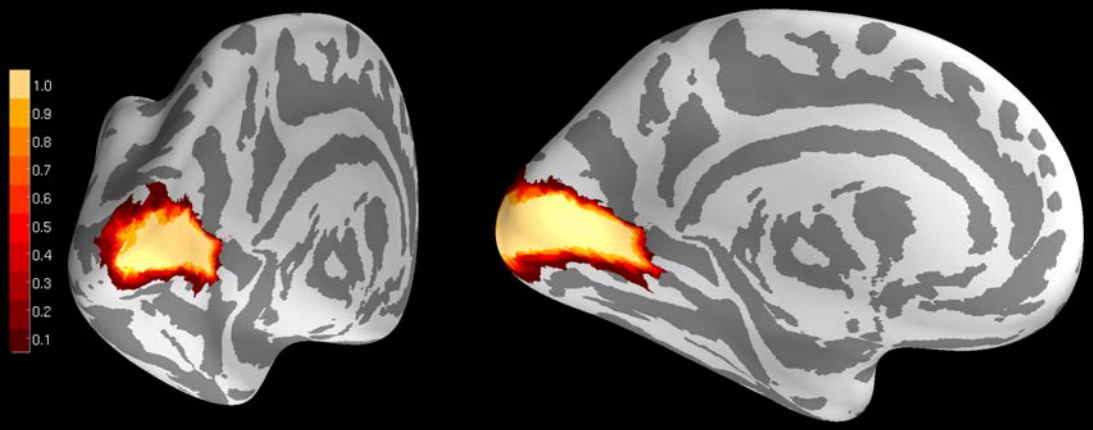
- Elucidating patterns of genetic and environmental influences is important for understanding brain morphometry, and for identifying promising regions for gene association studies.
- This requires large twin studies (present sample = 157 twin pairs)
- Heritabilities were 60-70% in dorsal frontal lobe, premotor and motor cortex, and the medial occipital lobe suggesting that these would be most promising for gene association analyses.
- Heritabilities were 30-50% in lateral temporal lobe and middle cingulate gyrus, indicating that up to 70% of variance in some of these regions was explained by environmental factors.
- Broca's and Wernicke's areas were not among the higher heritabilities, and there were corresponding no left-right differences.

Cortical folds predict V1 location

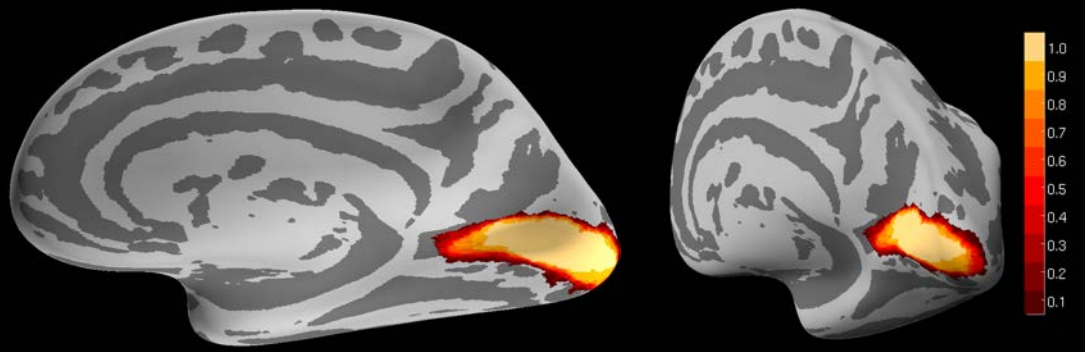
Hinds, et al. Poster #330 Tuesday PM



Left Hemisphere V1 Atlas



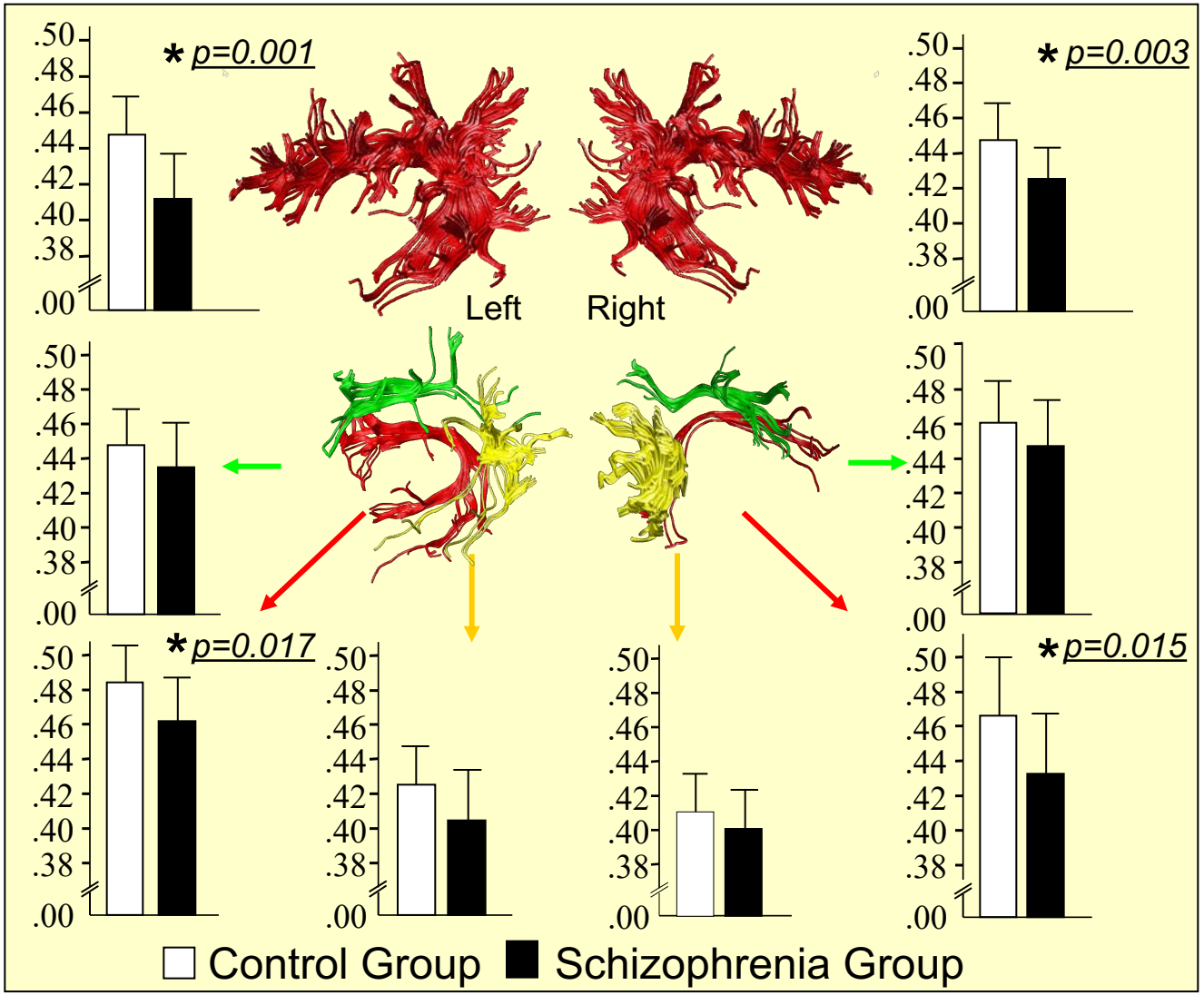
Right Hemisphere V1 Atlas



- Image *ex vivo* human at 7T
- Locate V1 via heavy myelin
- Build cortical surface mesh
- Register folds using FreeSurfer
- Build probabilistic atlas
- Excellent prediction accuracy

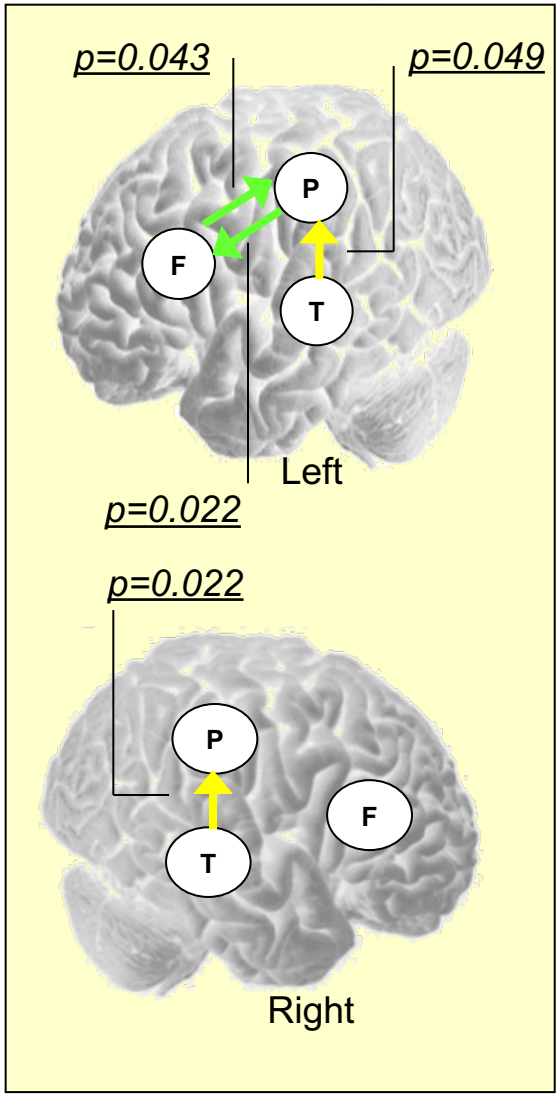
The functional neuroanatomy of perisylvian language networks in schizophrenia: a DTI-tractography and fMRI study

DTI-Tractography



arcuate fasciculus

DCM Analysis



Pugliese et al. 252 Tuesday, PM

Aaron Boes, University of Iowa

Tuesday Afternoon Poster Session

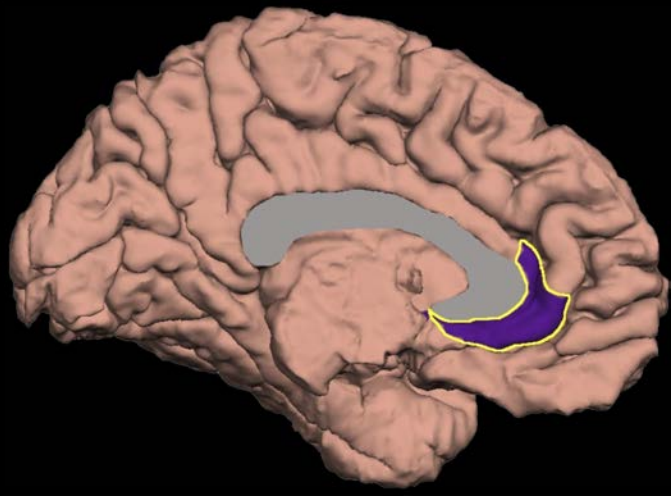
Rostral anterior cingulate cortex (rACC) volume correlates with depressed mood in normal healthy boys

Summary of Results:

1) Non-clinically depressed boys with mild depressive symptoms have lower rACC volume than boys with no reported symptoms ($F = 12.8$. $p = .001$)

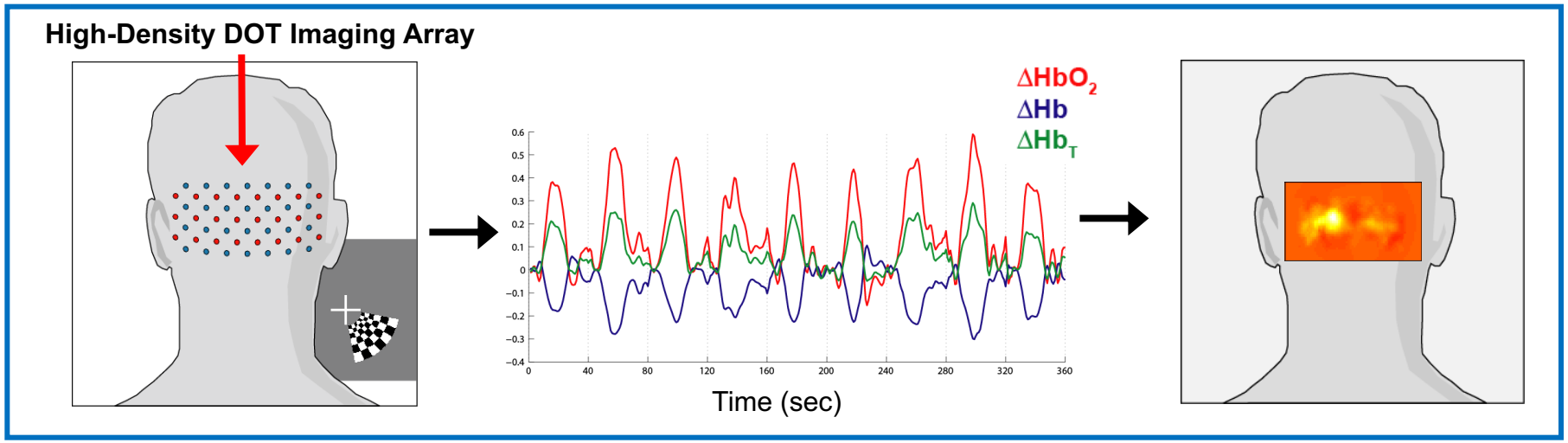
2) rACC volume negatively correlates with depressive symptoms in boys

3) Non-significant findings in girls

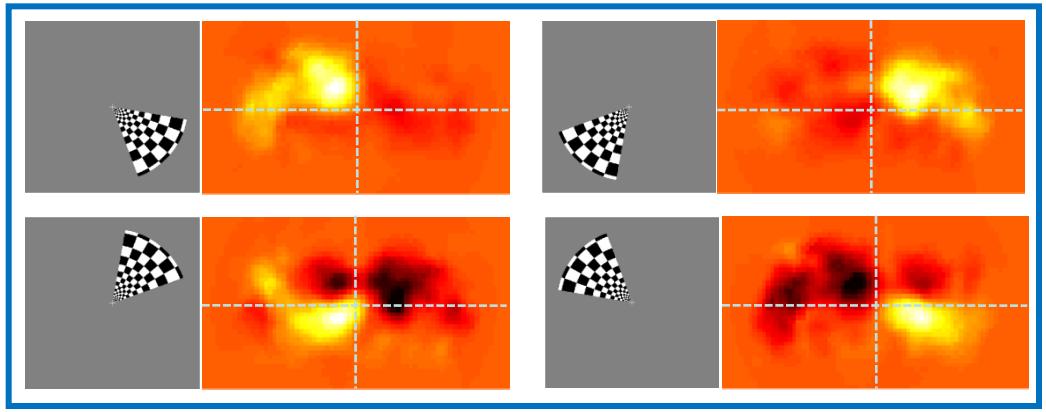


Implications: rACC structure may be a structural neural correlate of depression susceptibility

Retinotopic Mapping of the Adult Human Visual Cortex with DOT



- Angle and Eccentricity Maps
- Robust and Repeatable
- Wearable Cap
- Target Populations:
  - ICU patients
  - Children



Brian R. White and Joseph P. Culver *et al.* 214 Monday PM

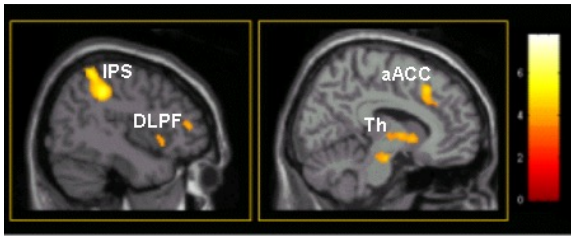
Baseline brain activity fluctuations predict somatosensory perception

M. Boly, E. Balteau, C. Schnakers, C. Degueldre, G. Moonen, A. Luxen, C. Phillips, P. Peigneux, P. Maquet, S. Laureys
Cyclotron Research Centre & Neurology Dept., University of Liège, Belgium

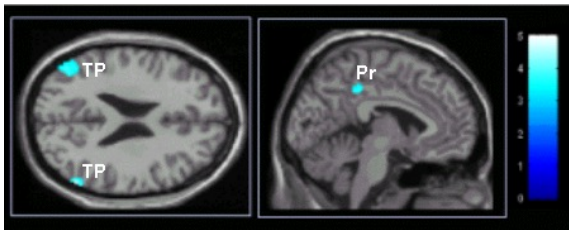
Poster #3 M-AM; Oral: "Cognition – Perception and Awareness" on Tuesday, June 12, 18:15.

3 seconds before stimulation:

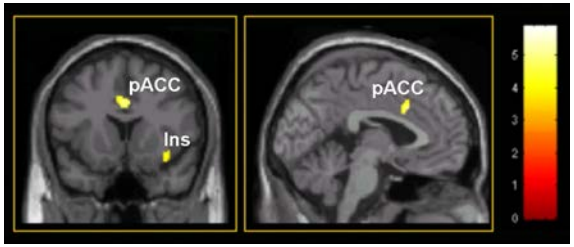
- Baseline *fronto-parietal* activity is high
  ⇒ stimulus will be *perceived*



- Baseline *default network* activity is high
  ⇒ stimulus will be *missed*

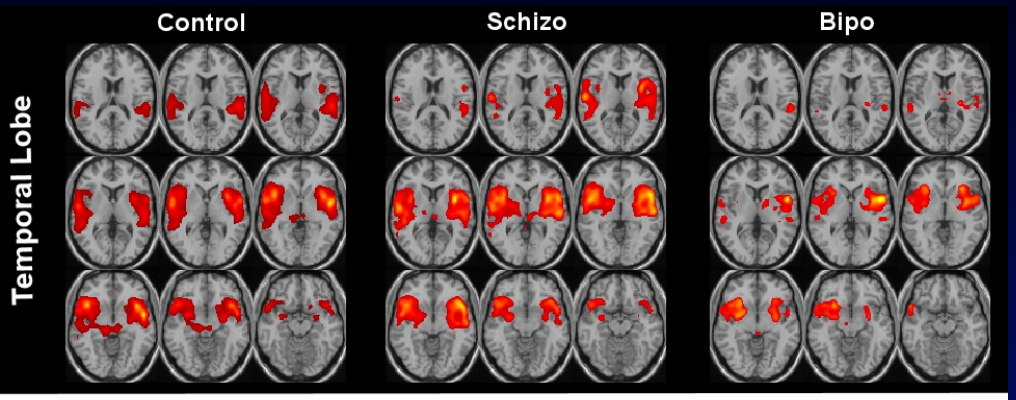


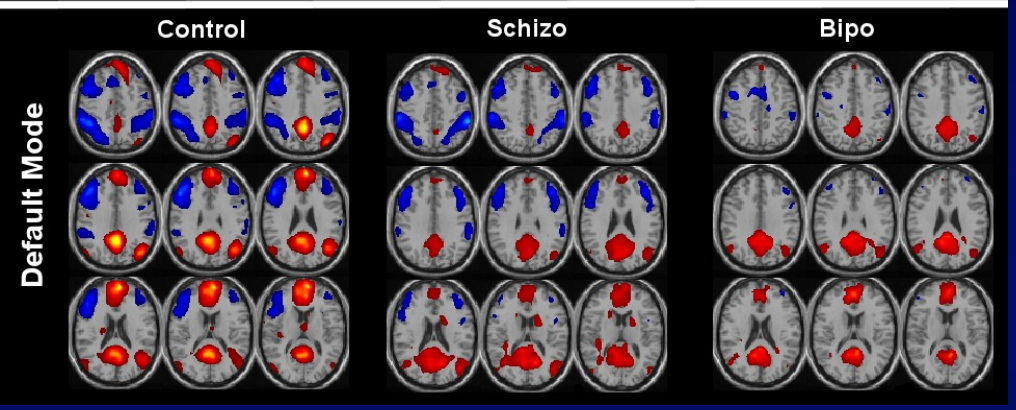
- Baseline *pain matrix* activity is high
  ⇒ stimulus will be *more painful*



Spontaneous baseline activity fluctuations foretell sensory and pain intensity perception.

SUNDAY JUNE 10	MONDAY JUNE 11	TUESDAY JUNE 12	WEDNESDAY JUNE 13	THURSDAY JUNE 14
Educational Courses				
Basic fMRI Course 8:00-17:30 Advanced fMRI Course 8:30-18:00 Advanced MEG/EEG Course 8:00-18:00 Cognitive Neuroscience Course 8:00-17:30 Structural Brain Mapping Course 8:00-17:30	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15
	LOC SYMPOSIUM 9:30-10:45	ORAL SESSIONS Imaging Techniques; Genetics; Disorders of the Nervous System 9:30-10:45	ORAL SESSIONS Imaging Techniques; Emotion and Motivation; Disorders of the Nervous System 9:30-10:45	ORAL SESSIONS Imaging Techniques; Cognition; Neuroanatomy 9:30-10:45
	KEYNOTE - Larry Squire 11:00-11:30	KEYNOTE - Mitsuo Kawato 11:00-11:30	KEYNOTE - Gary Glover 11:00-11:30	KEYNOTE - Maurizio Corbetta 11:00-11:30
	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30
	LUNCH 12:30-13:45	LUNCH 12:30-13:45	LUNCH 12:30-13:45	LUNCH 12:30-13:45
	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45
	SYMPOSIUM: Mapping Genetic Influences on Human Brain Structure and Function 15:00-16:15	SYMPOSIUM: A Multi-Level Perspective on the Neural Correlates of Perceptual Decision Making 15:00-16:15	SYMPOSIUM: Repetition and the Brain: From Neurons to Computational Models Using Multimodal Approaches 15:00-16:15	ORAL SESSIONS Modeling and Analysis; Cognition; Senory Systems 15:00-16:15
	KEYNOTE - Brian Wandell 16:30-17:00	TOWN HALL MEETING 16:30 -17:00	KEYNOTE - Willem Levelt 16:30-17:00	MEETING HIGHLIGHTS: Peter Bandettini, Past Chair 16:30 - 17:30
	ORAL SESSIONS Modeling and Analysis; Memory; Disorders of the Nervous System 17:00 -18:15	KEYNOTE - Leah Krubitzer 17:00-17:30 ORAL SESSIONS Modeling and Analysis; Cognition; Motor Behavior 17:30 -18:45	ORAL SESSIONS Modeling and Analysis; Emotion and Motivation; Language 17:00 -18:15	FAREWELL RECEPTION 17:30-18:30
OPENING CEREMONIES 18:30	POSTER RECEPTION 18:30-19:30	POSTER RECEPTION 19:00-20:00	POSTER RECEPTION 18:30-19:30	
TALAIRACH LECTURE Daniel Kahneman				
WELCOME RECEPTION 19:30			CLUB NIGHT 21:00	

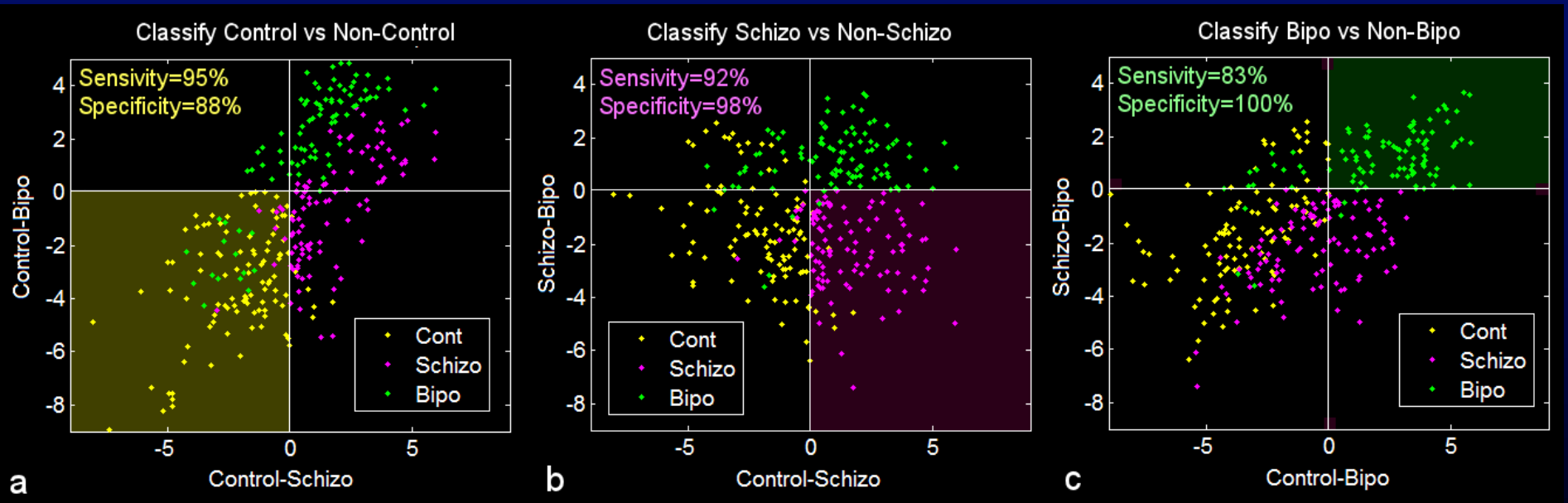




Vince Calhoun

Resting state ICA & classification for characterization of shizophrenia and bipolar patients

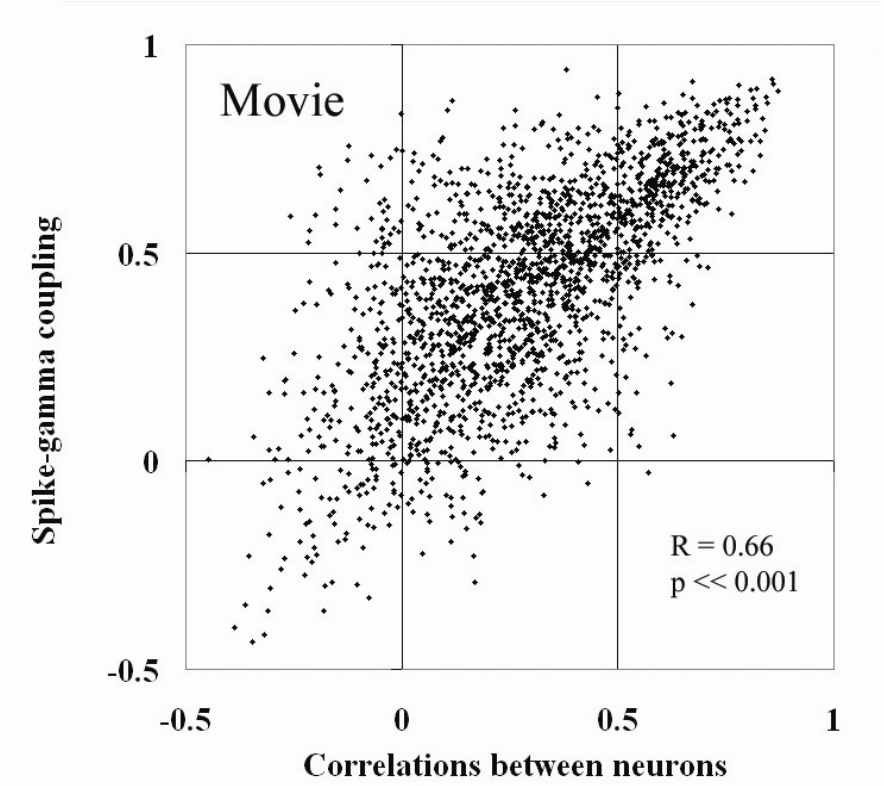
Results show a high average sensitivity (90%) and specificity (95%). Controls were correctly classified 95% of the time, schizophrenia patients 92%, and bipolar patients 81%.



Coupling between single-unit activities, gamma-LFP and BOLD-fMRI in human auditory cortex is tightly linked to the degree of inter-neuronal correlations

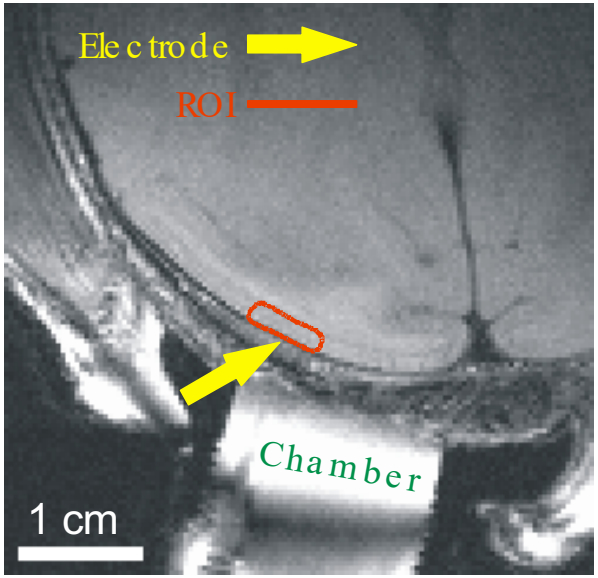
Yuval Nir, Lior Fisch, Roy Mukamel, Hagar Gelbard-Sagiv, Amos Arieli, Itzhak Fried and Rafael Malach

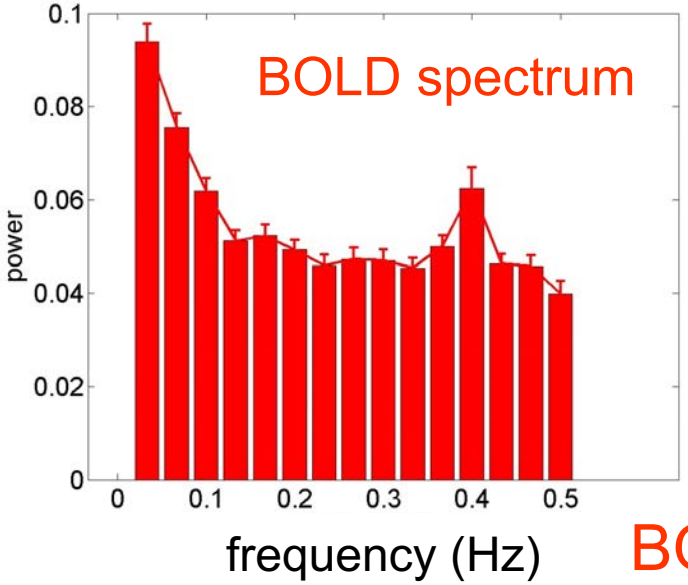
- A wide range of coupling levels between spikes and gamma LFP power in the same experimental setup.
- Spike-gamma coupling is tightly related to inter-neuronal correlations during stimulation and rest.
- Gamma LFP had high sustained coupling to BOLD.
- Individual neurons had variable coupling to BOLD, and this was related to inter-neuronal correlations.



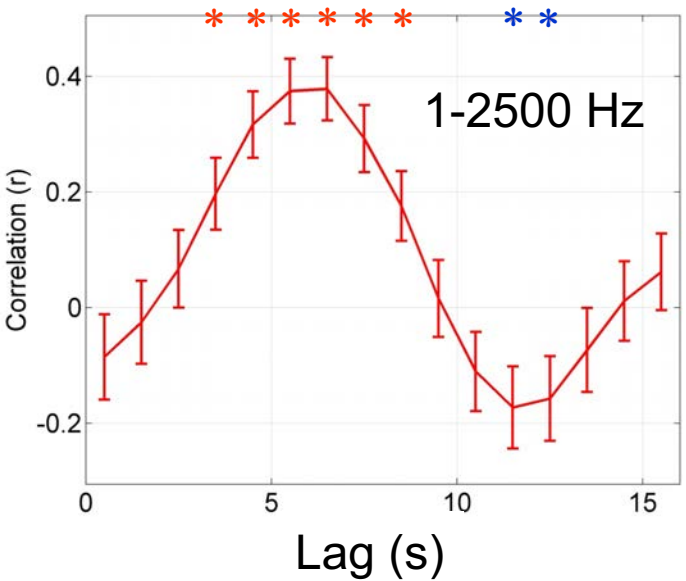
Presented in the "Imaging Techniques - MRI Methods 1" session on Wednesday morning

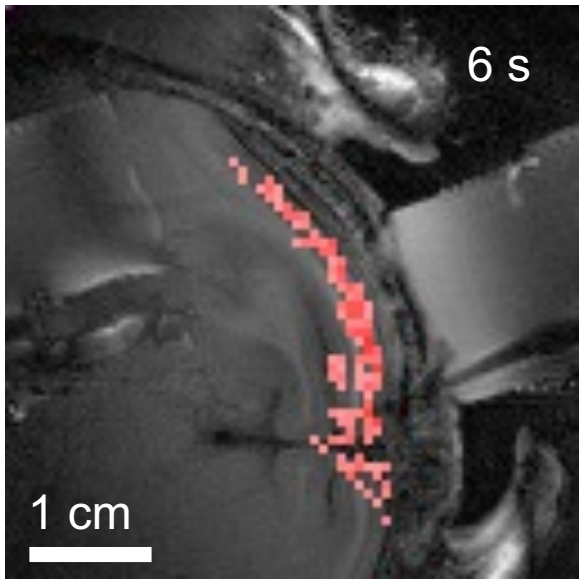
Spontaneous fluctuations in fMRI signal correlate with fluctuations in the underlying local neuronal activity

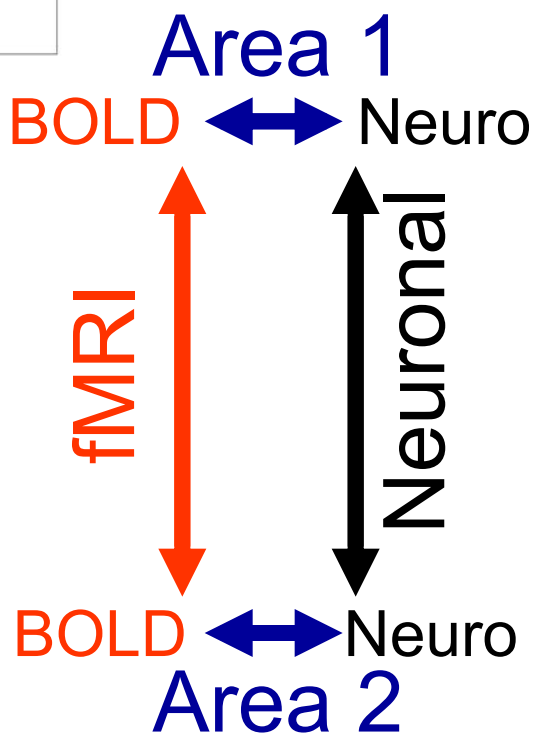




A Shmuel,
M Augath,
A Oeltermann,
N Logothetis

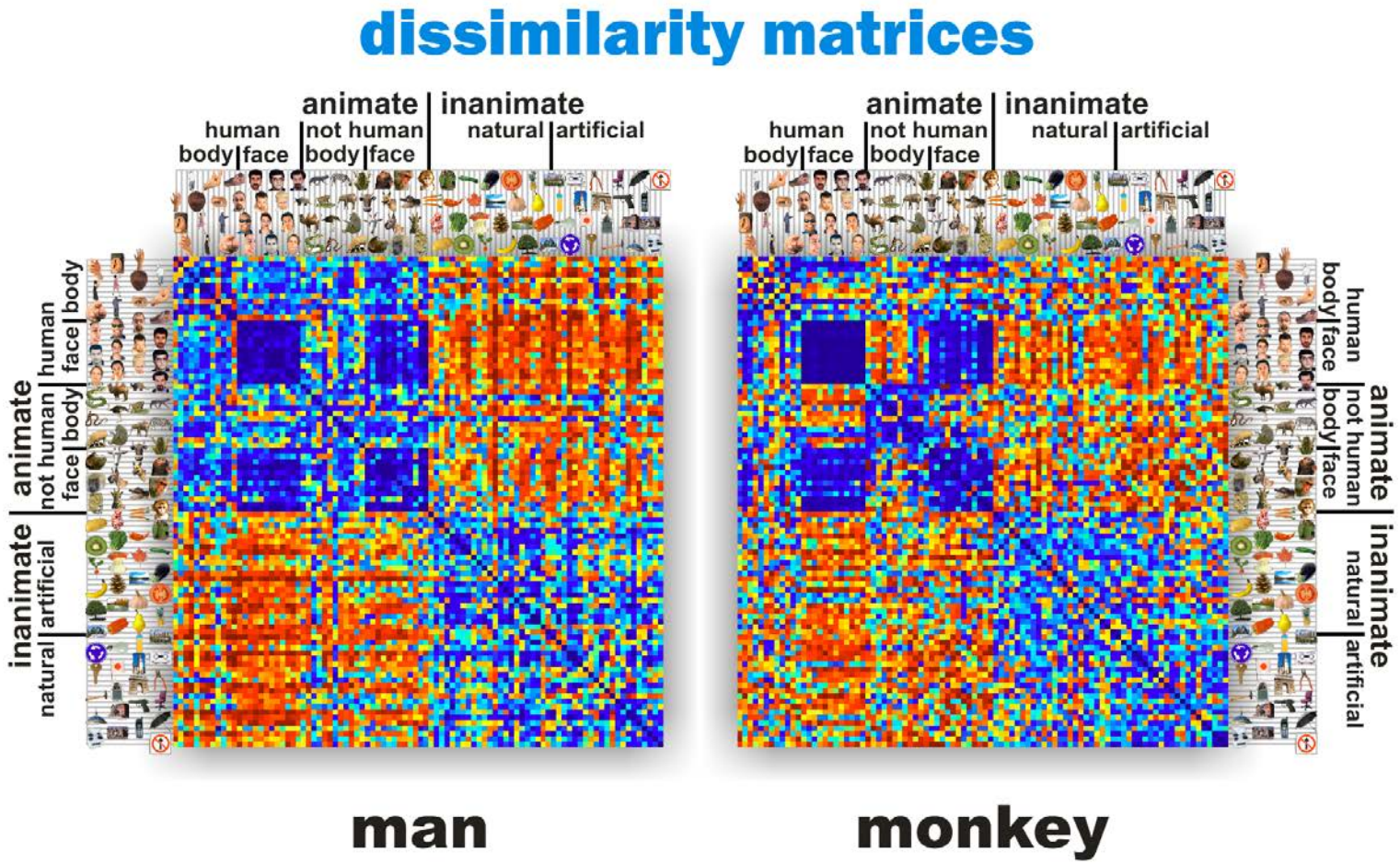






Matching categorical object representations in IT cortex of man & monkey

Kriegeskorte N, Mur M, Ruff D, Kiani R, Bodurka J, Bandettini P



Alternatives to T2*-wtd BOLD contrast

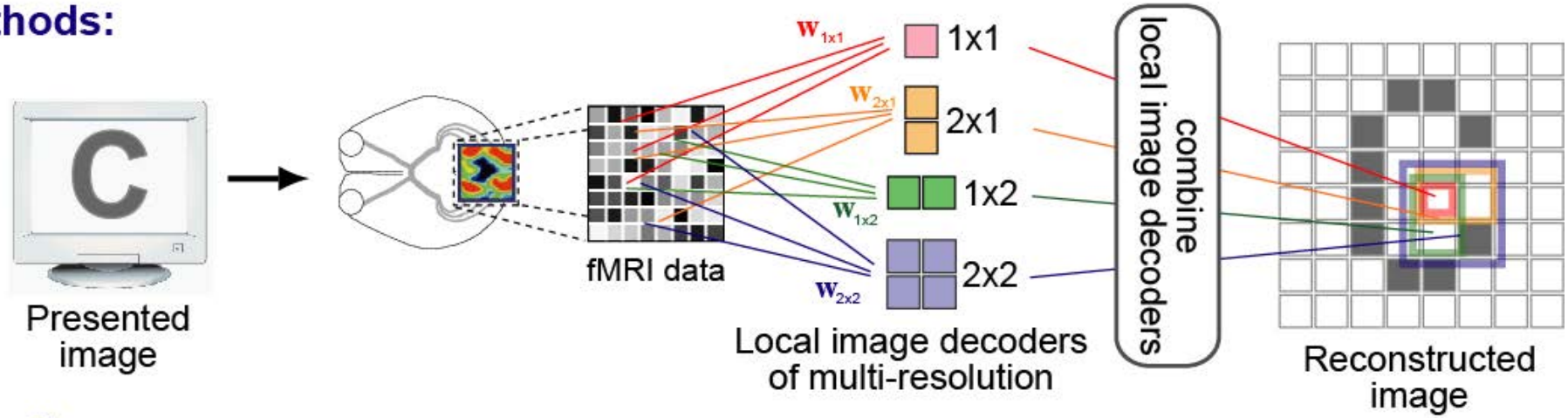
- Collecting BOLD contrast
  - SE: T2 -weighting
  - RASER
  - SSFP
- Other hemodynamic contrasts
  - CBF
  - CBV
  - SEEP
  - T1
- Non-hemodynamic contrasts
  - Diffusion
  - Direct neural current

156W-PM; Wednesday, June 13, 2007; 13:45–14:45

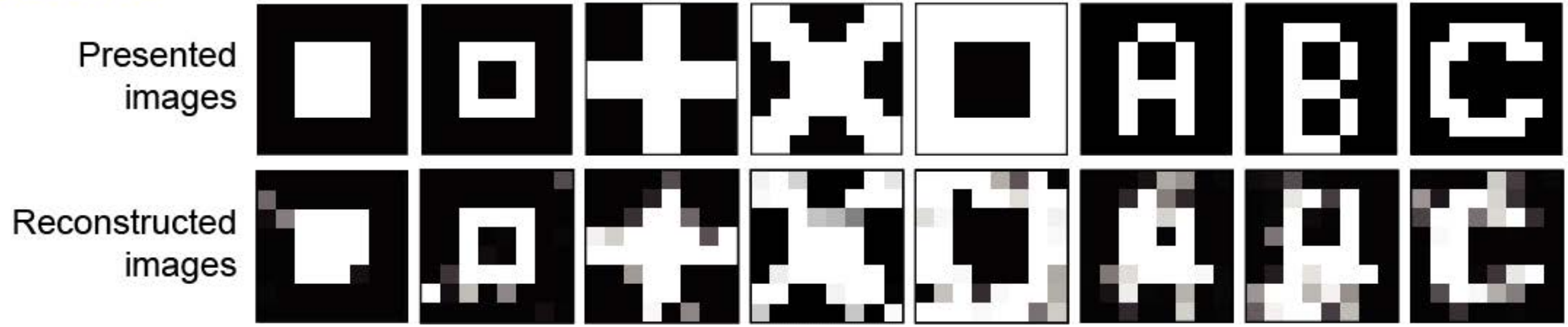
Reconstruction of arbitrary visual images from fMRI signals by the combination of local image decoders

Yoichi Miyawaki[1,2], Hajime Uchida[3,2], Okito Yamashita[2], Masa-aki Sato[2],
Hiroki C. Tanabe[4], Norihiro Sadato[4], and Yukiyasu Kamitani[2,3]
1) NICT, 2) ATR Comput Neurosci Lab, 3) NAIST, 4) NIPS; E-mail:yoichi_m@atr.jp

Methods:

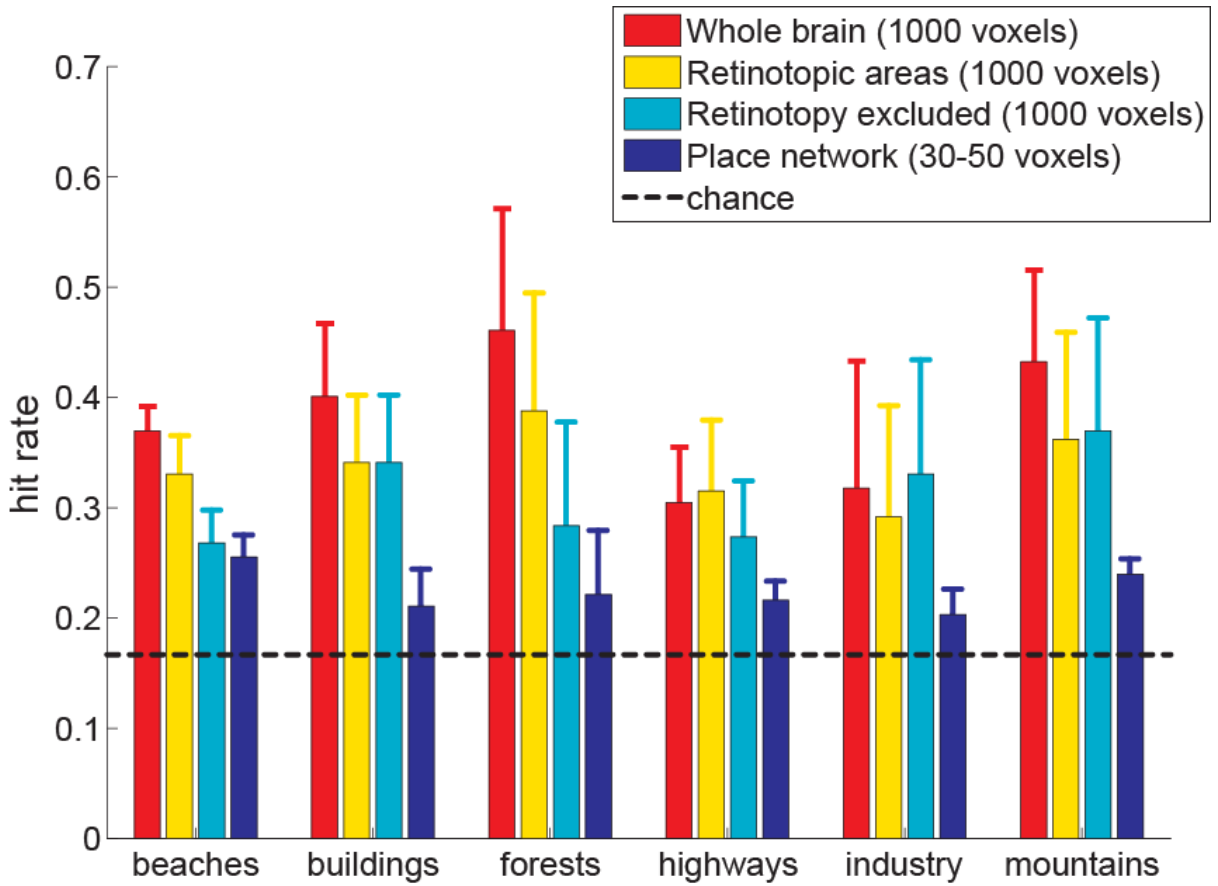


Results:



Predicting perceived natural scene categories from distributed patterns of fMRI activity

Dirk B. Walther, Eamon Caddigan,
Justas Birgiolas, Li Fei-Fei, Diane Beck



Functional Connectivity Reflects Structural Connectivity in a Human Memory Network

Greicius, Supekar, Menon, Dougherty: Wednesday PM

Resting-state fMRI was combined with DTI tractography to distinguish monosynaptic from polysynaptic connections in the default-mode network.

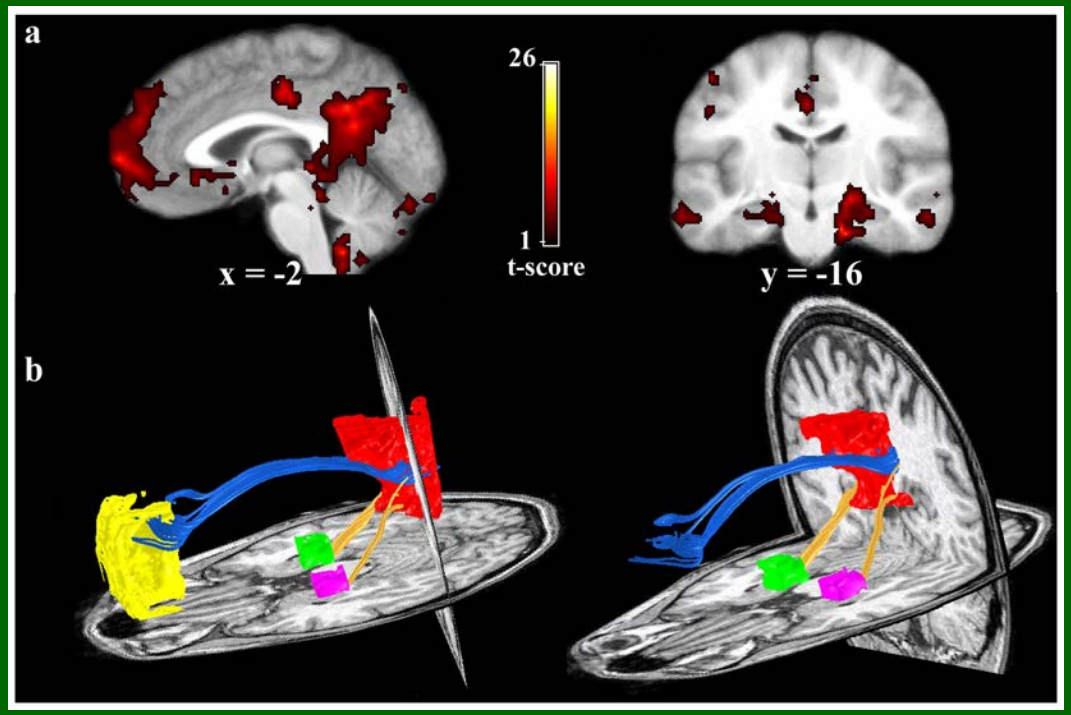
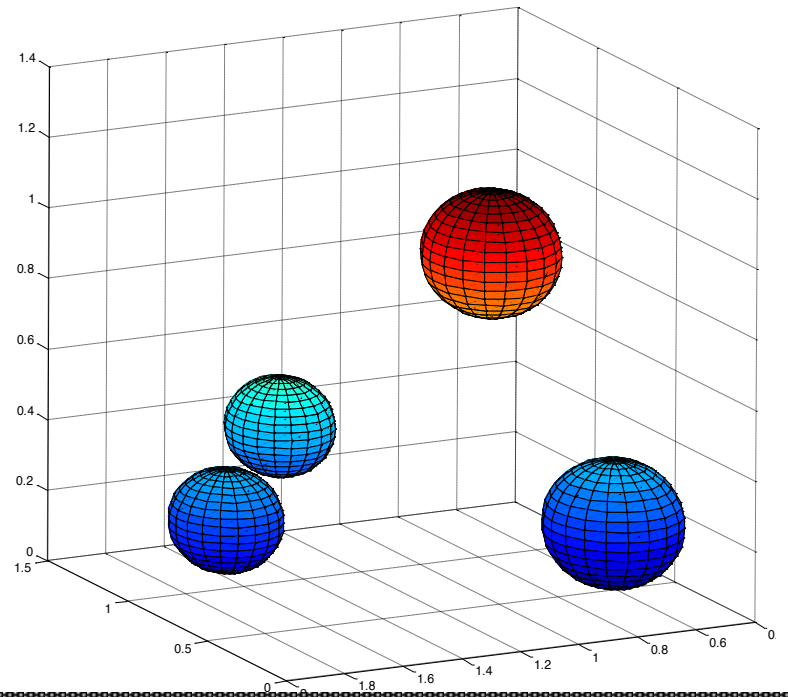


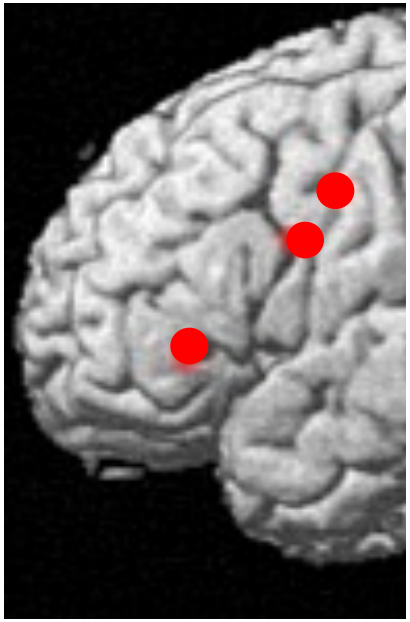
Figure 1: The default-mode network as detected by resting-state fMRI is shown in (a). DTI tractography (b) shows the cingulum bundle (blue) connecting the MPFC to PCC and fibers in the descending cingulum (gold) connecting PCC to MTL. **There were no tracts connecting MPFC to MTL suggesting that functional connectivity between these two nodes occurs via a third party, possibly the PCC.**

Finding Hidden Groups of Subjects from Intersubject Variability

FERATH KHERIF: POSTER 179 T-AM

LANGUAGE SESSION : WEDNESDAY 5:30PM

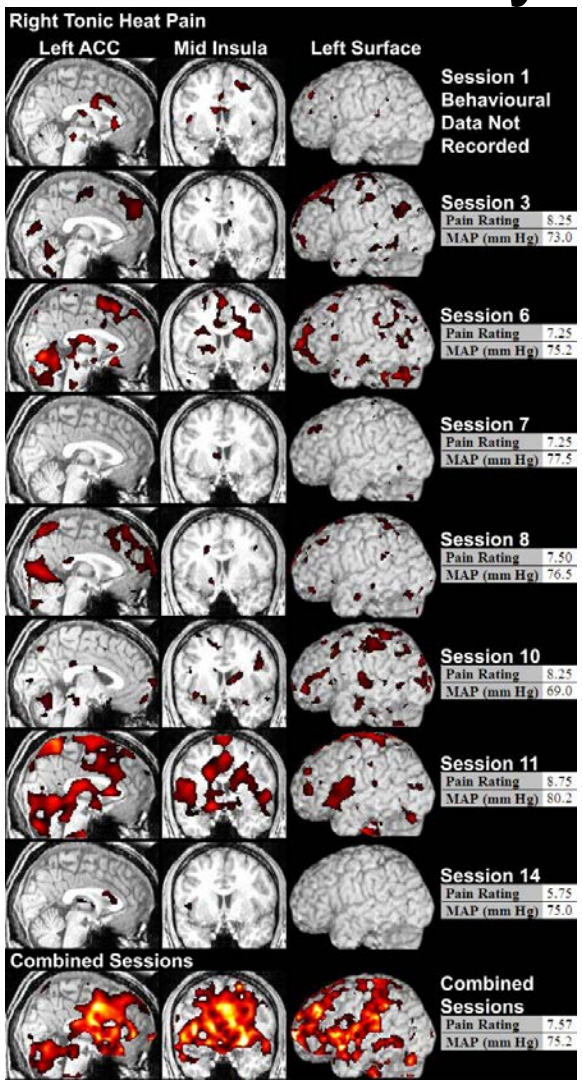




Results dissociate 4 subgroups of subjects who differentially activate semantic or non-semantic pathways for reading aloud simple words. (Gaussian Mixture Model)

Wellcome Trust Center for Neuroimaging, London, UK

Same Brain, Same Pain. Different Day, Different Activation – Wed PM/Thurs 4pm Derbyshire et. al



Ouch!

Ouch! again

Ouch! again

Ouch! again

Ouch! again

Ouch! again

Ouch! again

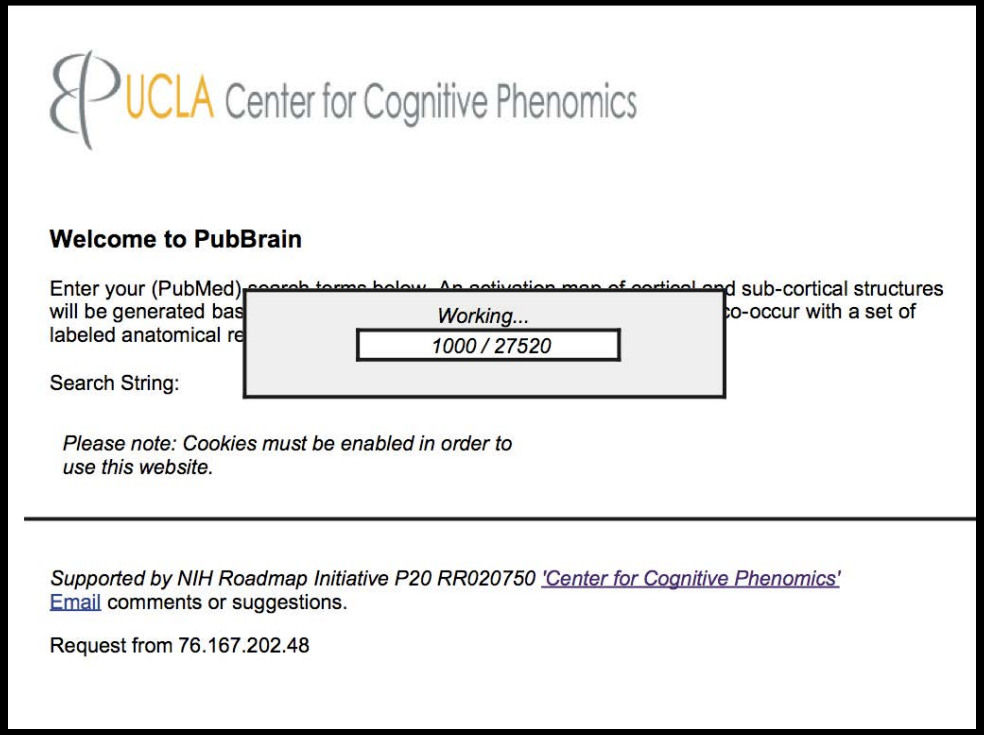
Ouch! again

Average Ouch!

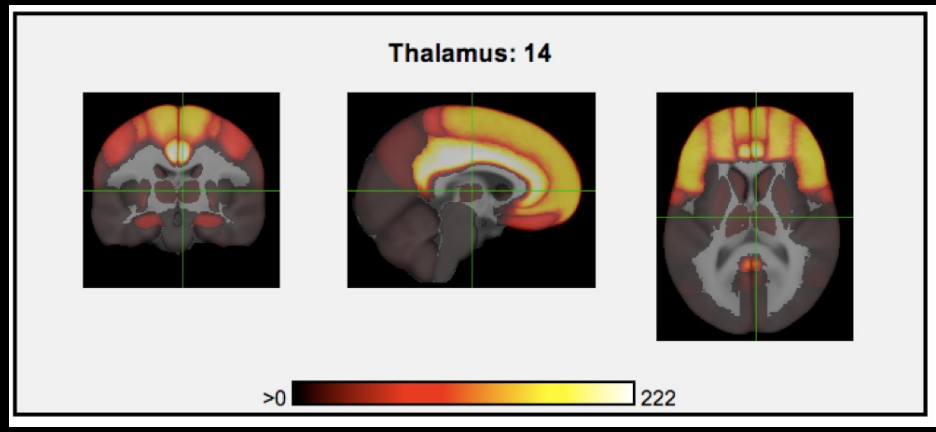
PubBrain:

An interactive website for literature visualization and exploration

DJ Kalar, RA Poldrack, DS Parker, VI Torvik, NR Smalheiser, RM Bilder



"Stroop Task"



UCLA Center for Cognitive Phenomics

The Neuroimaging Informatics Tools and Resources Clearinghouse (NITRC)

NITRC ...The Source for Neuroimaging Tools and Resources

[1]Robert Buccigrossi, [2]Mark Ellisman, [2]Jeff Grethe, [3]Christian Haselgrove, [4]David Kennedy, [2]Maryann Martone, [1]Kim Pohland, [1]Nina Preuss, [1]Maureen Sullivan , [1]Judith Turner & [1]Keith Wagner

[1]Turner Consulting Group, Inc., Washington, DC; [2]University of California, San Diego, CA; [3]Neuromorphometrics, Inc, Somerville, MA; [4]David N. Kennedy Consulting, Belmont MA.

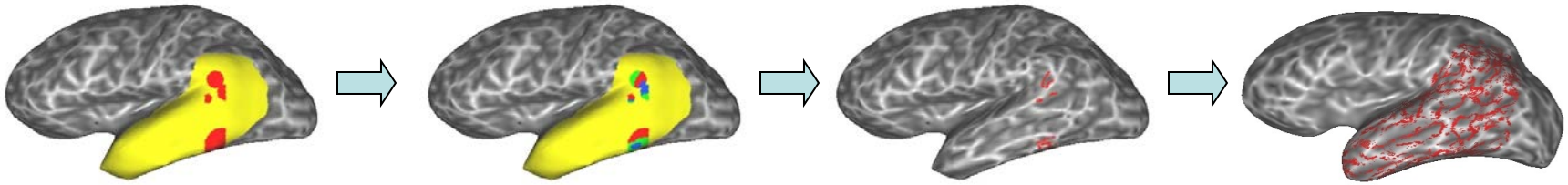
nitrc.nih.gov

SUNDAY JUNE 10	MONDAY JUNE 11	TUESDAY JUNE 12	WEDNESDAY JUNE 13	THURSDAY JUNE 14
Educational Courses				
Basic fMRI Course 8:00-17:30 Advanced fMRI Course 8:30-18:00 Advanced MEG/EEG Course 8:00-18:00 Cognitive Neuroscience Course 8:00-17:30 Structural Brain Mapping Course 8:00-17:30	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15	MORNING WORKSHOPS 8:00-9:15
	LOC SYMPOSIUM 9:30-10:45	ORAL SESSIONS Imaging Techniques; Genetics; Disorders of the Nervous System 9:30-10:45	ORAL SESSIONS Imaging Techniques; Emotion and Motivation; Disorders of the Nervous System 9:30-10:45	ORAL SESSIONS Imaging Techniques; Cognition; Neuroanatomy 9:30-10:45
	KEYNOTE - Larry Squire 11:00-11:30	KEYNOTE - Mitsuo Kawato 11:00-11:30	KEYNOTE - Gary Glover 11:00-11:30	KEYNOTE - Maurizio Corbetta 11:00-11:30
	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30	POSTER SESSION 11:30-12:30
	LUNCH 12:30-13:45	LUNCH 12:30-13:45	LUNCH 12:30-13:45	LUNCH 12:30-13:45
	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45	POSTER SESSION 13:45-14:45
	SYMPOSIUM: Mapping Genetic Influences on Human Brain Structure and Function 15:00-16:15	SYMPOSIUM: A Multi-Level Perspective on the Neural Correlates of Perceptual Decision Making 15:00-16:15	SYMPOSIUM: Repetition and the Brain: From Neurons to Computational Models Using Multimodal Approaches 15:00-16:15	ORAL SESSIONS Modeling and Analysis; Cognition; Senory Systems 15:00-16:15
	KEYNOTE - Brian Wandell 16:30-17:00	TOWN HALL MEETING 16:30 -17:00	KEYNOTE - Willem Levelt 16:30-17:00	MEETING HIGHLIGHTS: Peter Bandettini, Past Chair 16:30 - 17:30
	ORAL SESSIONS Modeling and Analysis; Memory; Disorders of the Nervous System 17:00 -18:15	KEYNOTE - Leah Krubitzer 17:00-17:30 ORAL SESSIONS Modeling and Analysis; Cognition; Motor Behavior 17:30 -18:45	ORAL SESSIONS Modeling and Analysis; Emotion and Motivation; Language 17:00 -18:15	FAREWELL RECEPTION 17:30-18:30
OPENING CEREMONIES 18:30	POSTER RECEPTION 18:30-19:30	POSTER RECEPTION 19:00-20:00	POSTER RECEPTION 18:30-19:30	
TALAIRACH LECTURE Daniel Kahneman				
WELCOME RECEPTION 19:30			CLUB NIGHT 21:00	

Connectivity Based Parcellation of the Superior Temporal Cortex

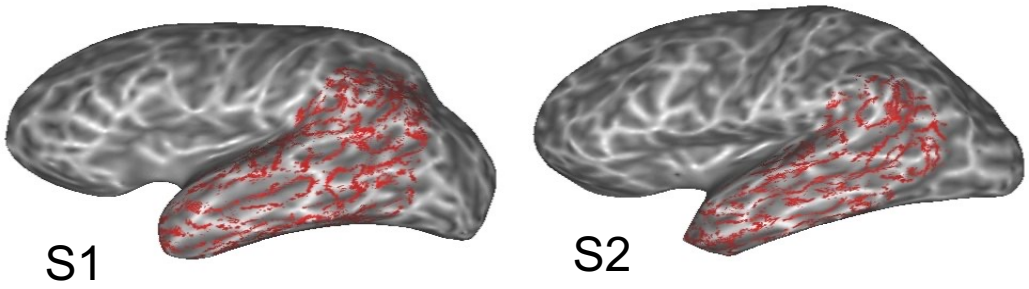
Benjamin C. Stengel, Colin Humphries, Michael Austin, Jeffrey R. Binder

Medical College of Wisconsin, Milwaukee, WI, USA

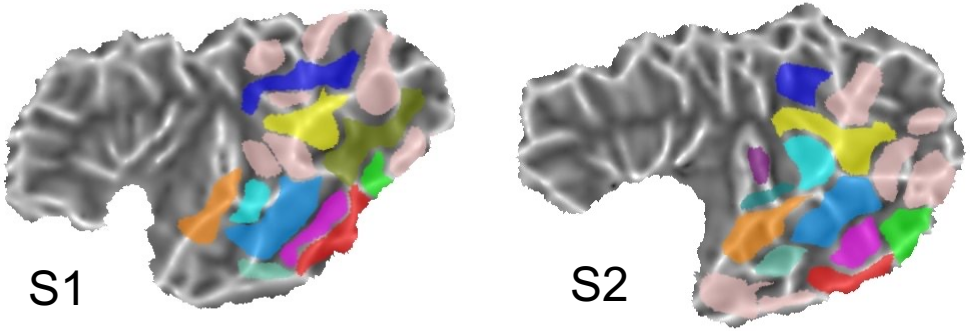


A novel, fully automated method for cortical parcellation:

- Thousands of random samples of small cortical regions.
- Clustering of tractography maps within each sample.
- Gradual accumulation of boundary points, resulting in a probabilistic boundary map.



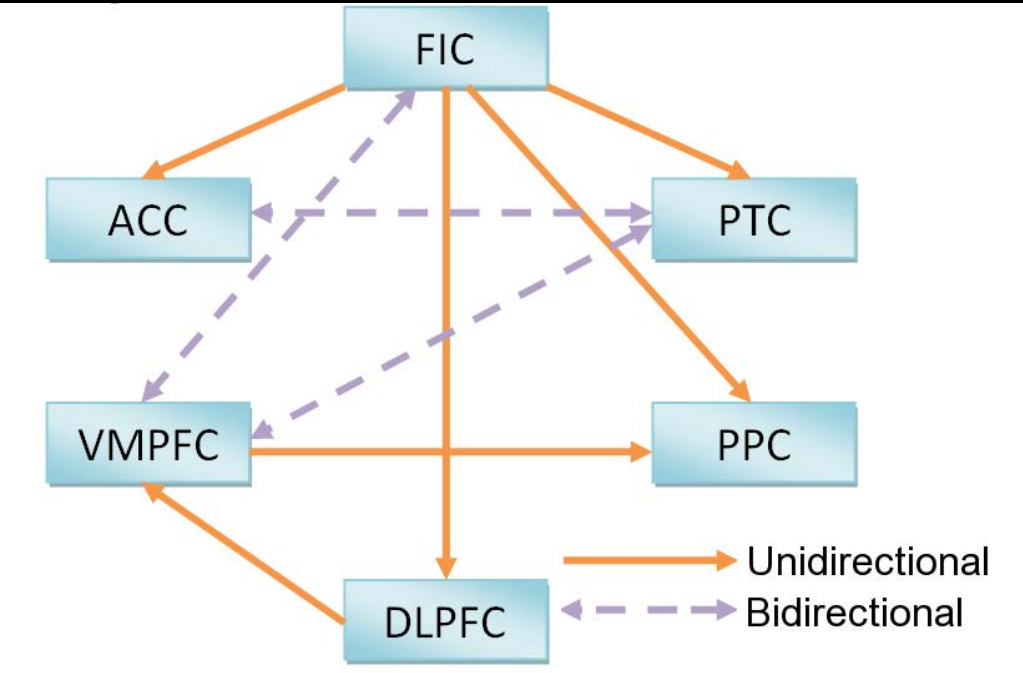
Example of probabilistic boundary maps in two subjects



Twelve areas identified based on common locations and connectivity patterns across subjects

A Causal Role for the Right Fronto-Insular Cortex (FIC) in switching between Executive Control (ECN) and Default Mode Networks (DMN)

Sridharan Devarajan, Daniel Levitin, Vinod Menon (Thu, 10AM)

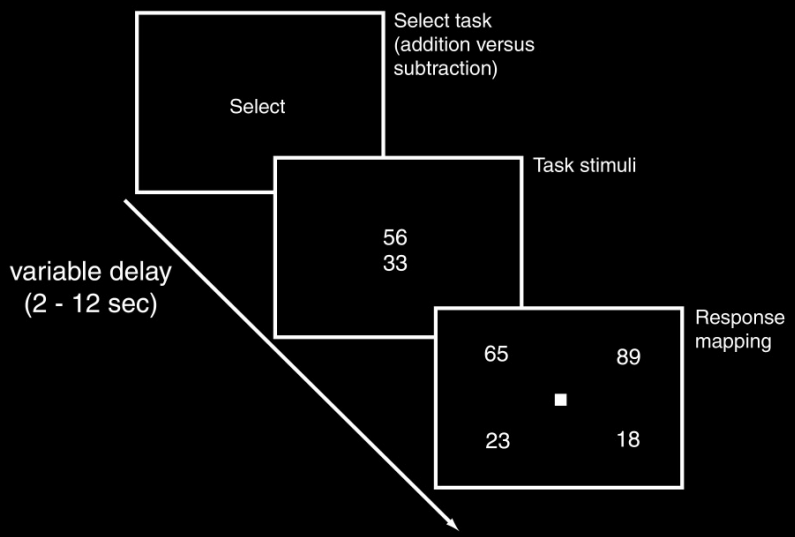


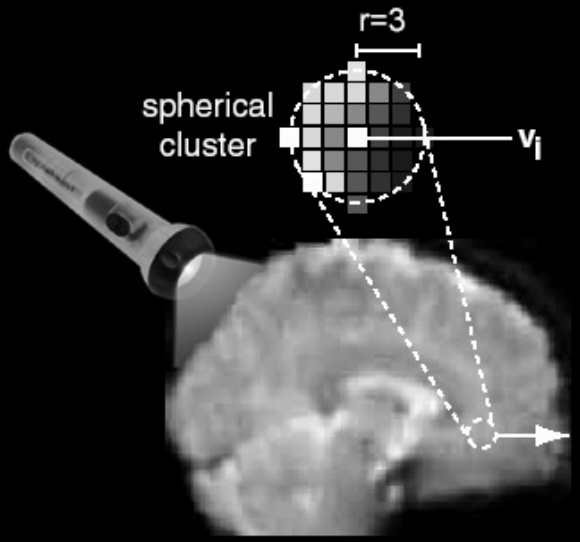
ROI	Out-degree	In-degree	Path Length
FIC	5	1	1.0
ACC	1	2	1.6
VMPFC	3	3	1.2
DLPFC	1	1	1.6
PPC	0	2	1.6
PTC	2	3	1.4

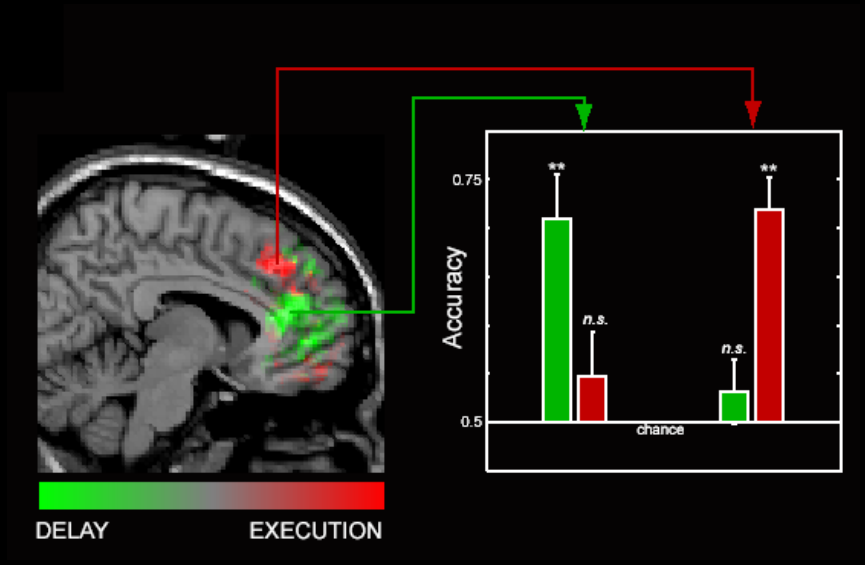
- Granger Causal Analysis revealed that the right FIC is a causal hub at the intersection of the ECN and DMN
- Right FIC is uniquely positioned to play a *critical causal role in switching* between the ECN and DMN
- These findings may have important implications for understanding the neural basis of cognitive control

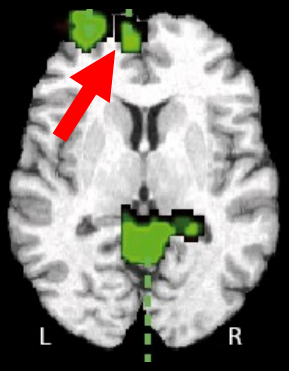
Reading hidden intentions in the human brain

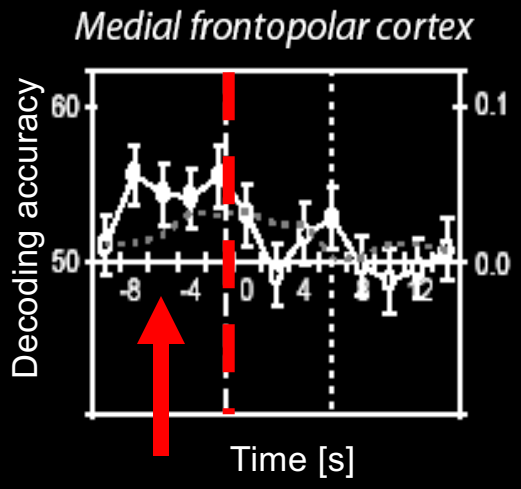
Thu 9.45: Cognition – Representation and Processes











Haynes, Sakai, Rees, Gilbert, Frith & Passingham (Current Biology,2007)

Soon, Brass, Heinze & Haynes (in preparation)

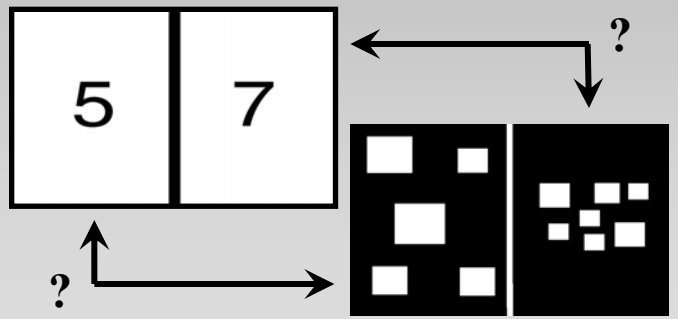
The Neural Correlates of Mapping Numerical Quantities onto Abstract Symbols

Ian M. Lyons and Daniel Ansari

[Thursday Morning Presentation]

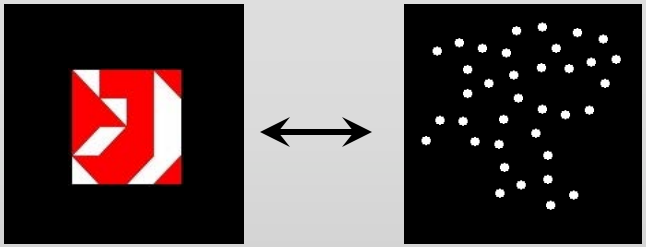
I

The Symbol-Mapping Problem



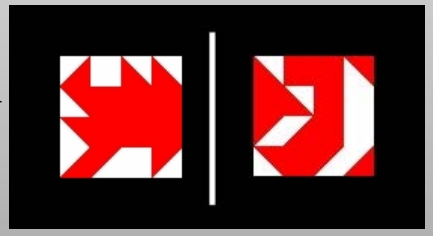
II

We simulated this symbol-mapping process using a novel set of symbols.



III

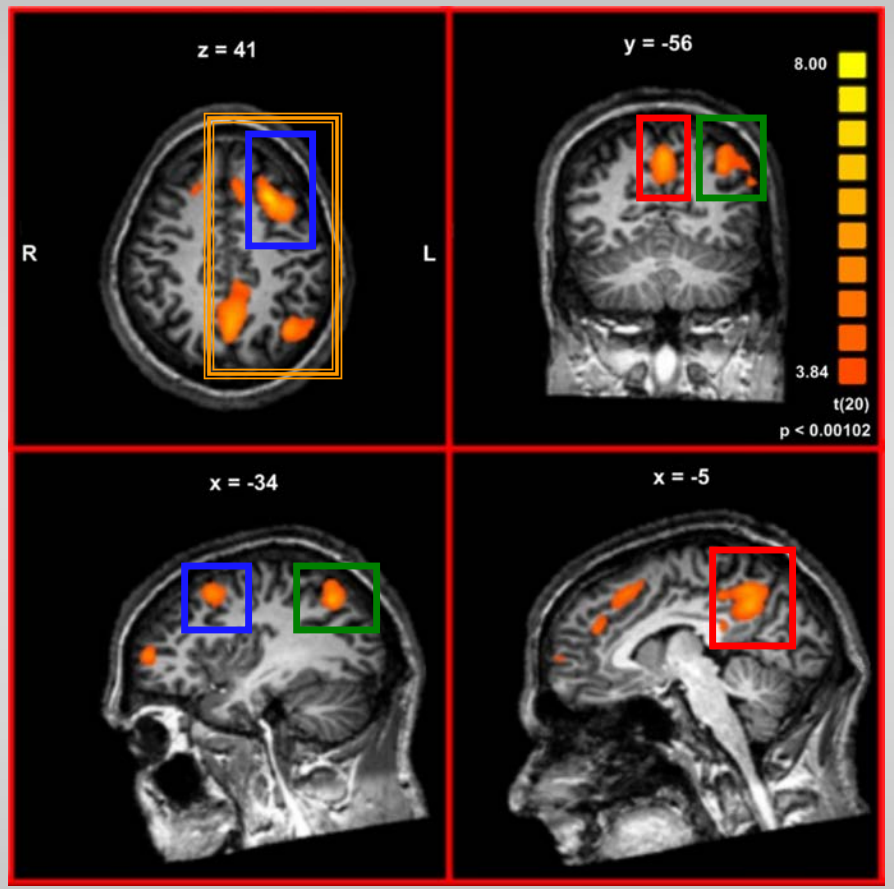
Participants then compared the symbols in terms of the approximate quantities they represented.



"Which represents more dots?"

IV

Numerical Comparison > Control

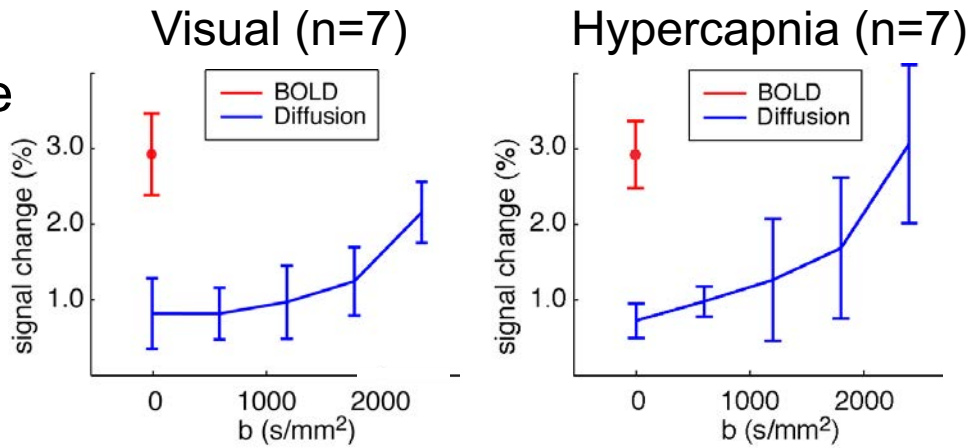


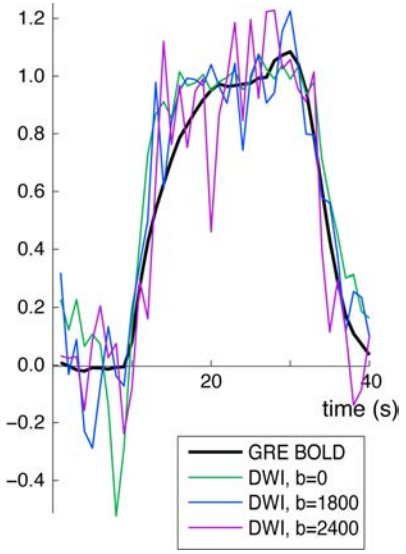
- **Left-lateralized fronto-parietal network**
- Precuneus: *Increased* activity with more training
  *Correlated with accuracy increases
- Left inferior parietal lobe: *Decreased* activity with training
- Left middle-frontal gyrus: *Decreased* activity with training
  *Rate of decrease highly correlated with parietal decrease

V

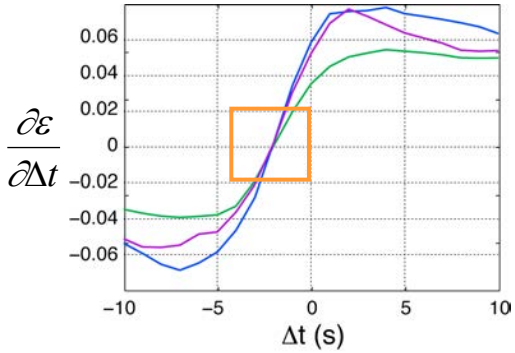
Does diffusion FMRI detect activation-induced neuronal swelling or vascular changes?

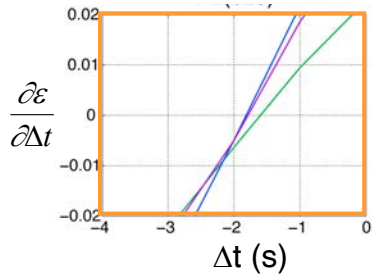
1. Signal increases with b-value during hypercapnia (purely vascular) and visual stimulation (activation)





$$\varepsilon(\Delta t) = \sqrt{[\mathrm{BOLD}(t) - \mathrm{DWI}(t - \Delta t)]^2}$$





2. No fast response at high b-value

Strong evidence for a vascular component in diffusion FMRI

Miller, Bulte, Devlin, Robson, Wise, Woolrich, Jezzard, Behrens, 283 Thursday Morning

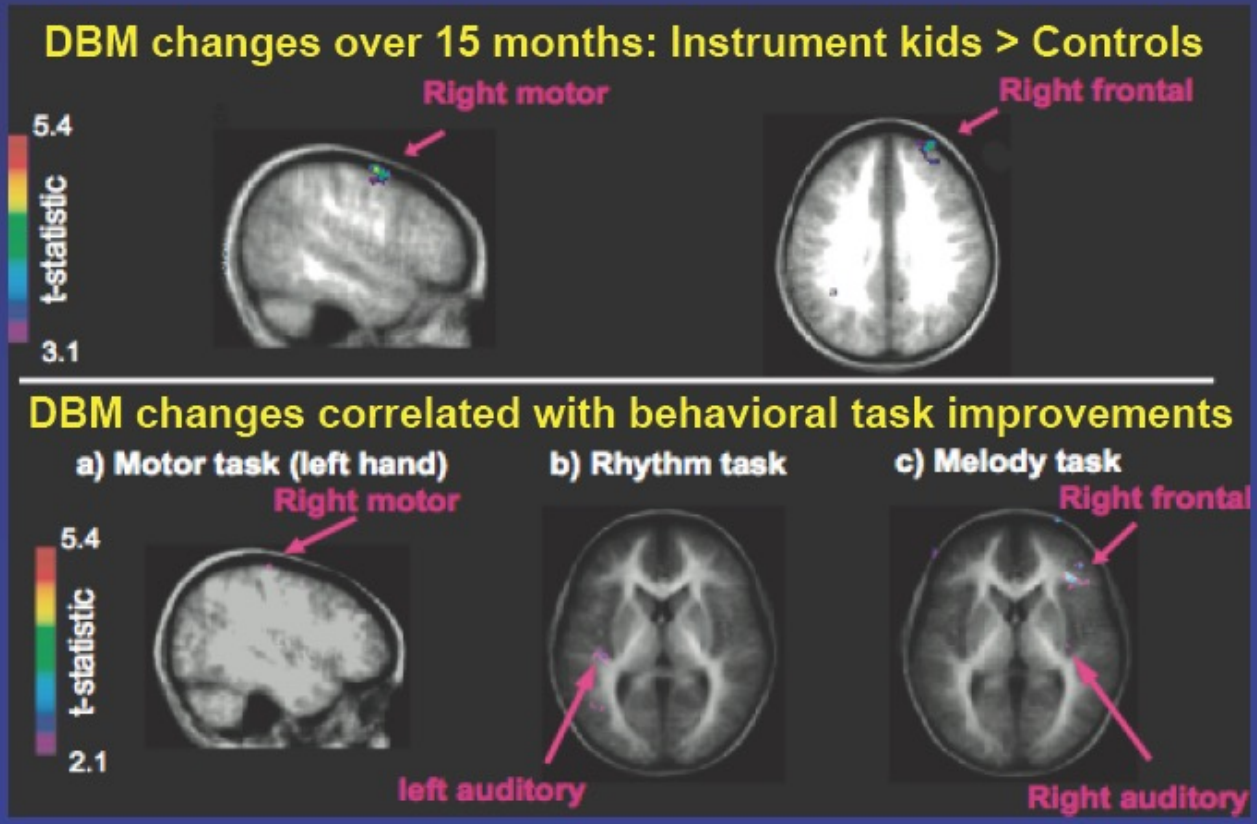
FMRIB

The effects of musical training on structural brain development: a longitudinal study

Hyde, Lerch, Norton, Kotynek-Friedl, Lyengar, Forgeard, Evans, Winner & Schlaug

HBM poster #170, June 14, 2007, PM session

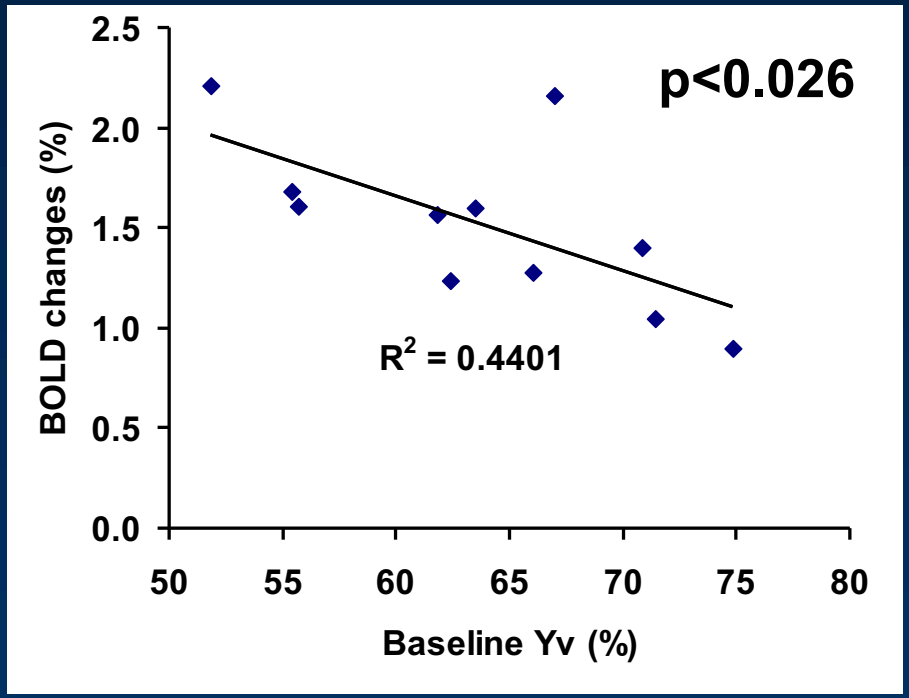
- Deformation based morphometry (DBM) was used to study structural brain plasticity in children who received instrumental musical training for ~15 months vs. control children who did not.



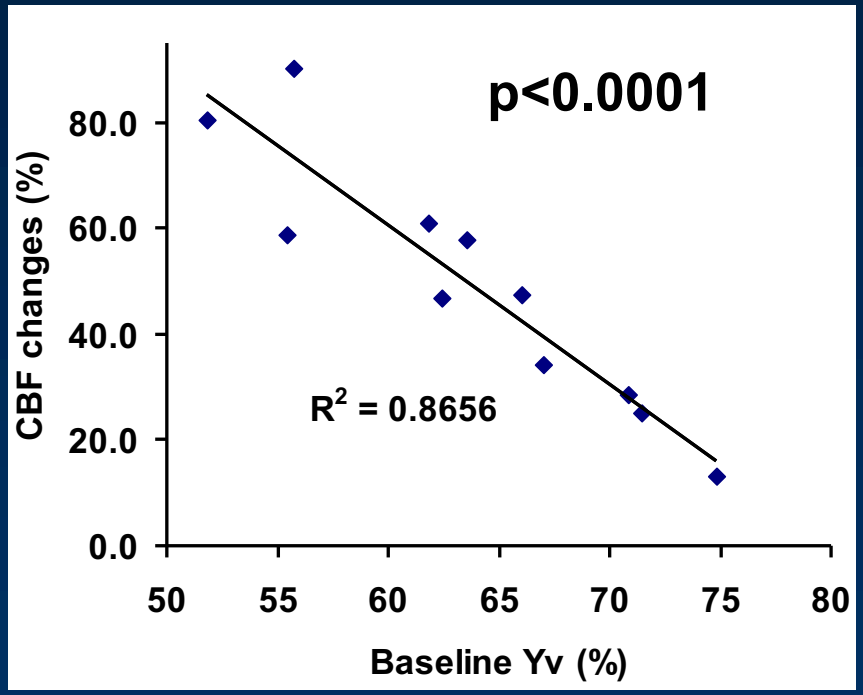
- We conclude that the differential development of these brain regions is induced by long-term instrumental practice.

Baseline blood oxygenation modulates fMRI signals

BOLD fMRI



ASL fMRI



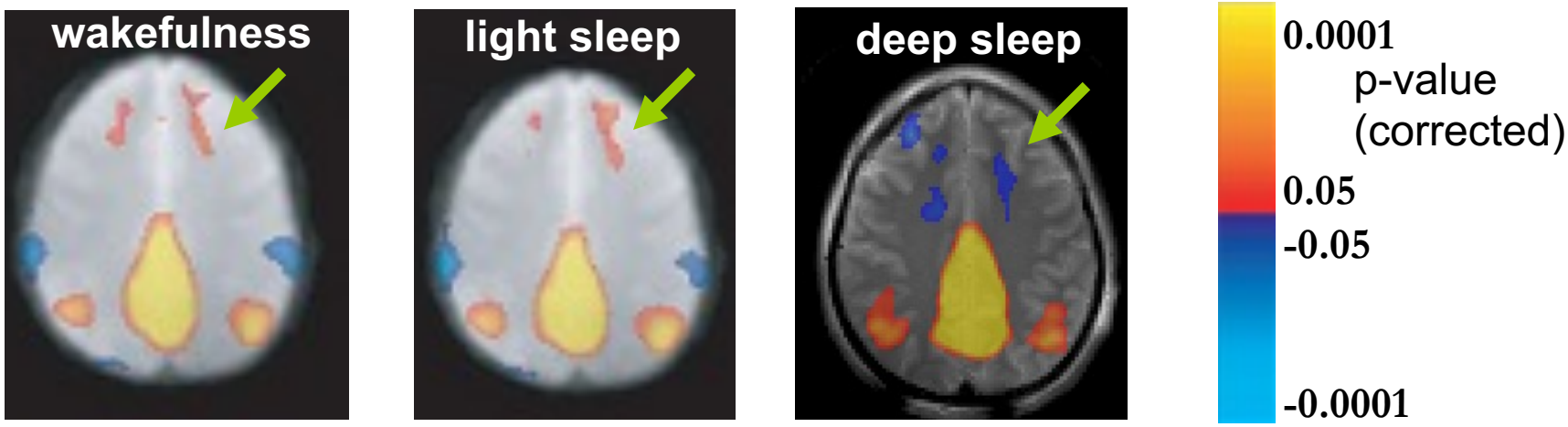
Individuals with higher baseline venous oxygenation tend to have smaller BOLD and CBF percentage signal changes

Hanzhang Lu et al. OHBM 2007, 278 - Thursday PM

Functional connectivity during deep sleep: a simultaneous EEG-fMRI study

Horovitz, Fukunaga, Carr, Picchioni, de Zwart, van Gelderen, Balkin, Braun, Duyn

(poster 19 M-PM; talk Thurs 3pm)



n=6 n=6 n=11

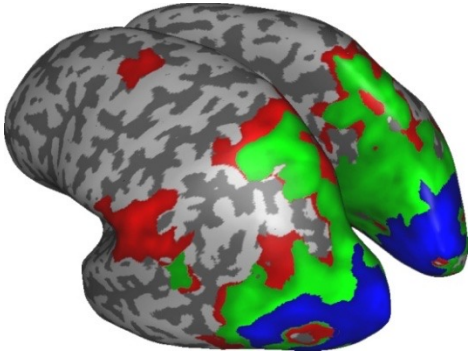
- **Correlated activity is seen both during light and deep sleep.**
- **Anterior dissociations are observed during deep sleep**
- **Correlated fluctuations do not require a conscious level typical of the waking state.**

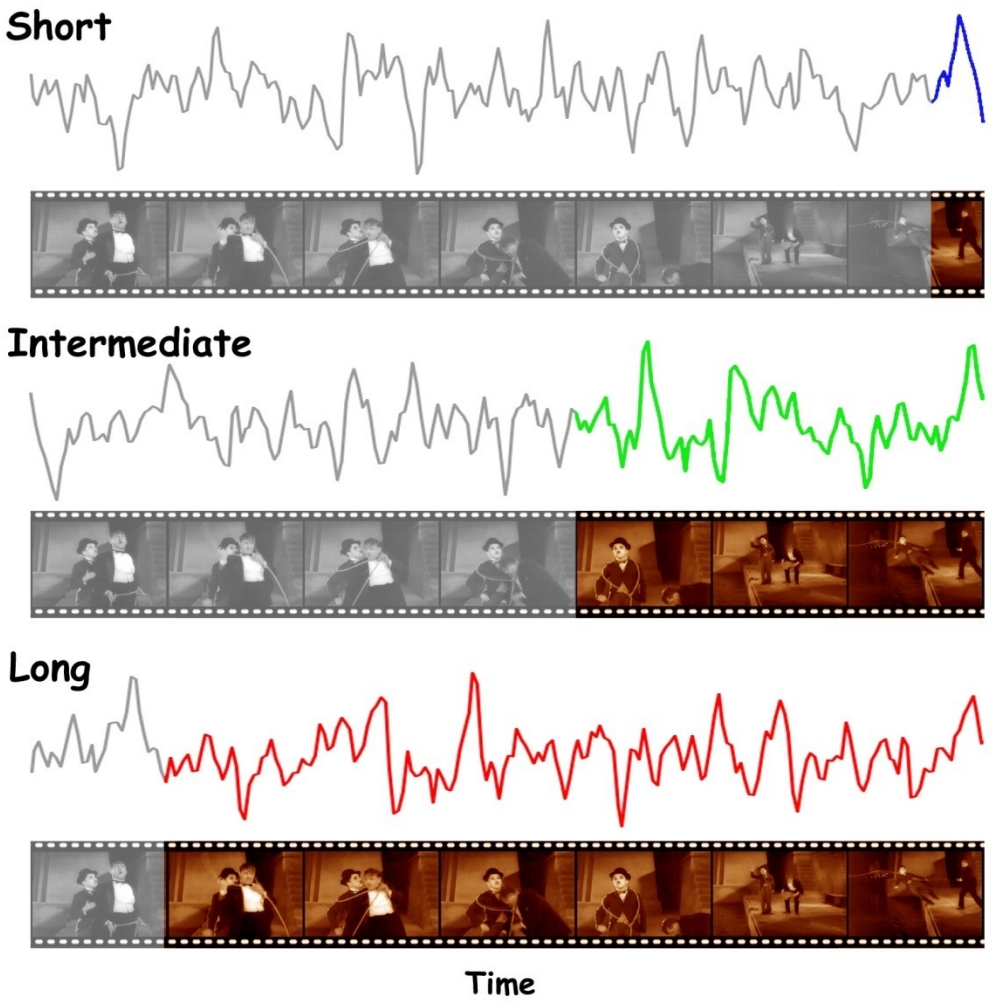
Wakefulness and light sleep data from Horovitz et al, HBM 2007

Using Movies to Identify Temporal Scales of Cortical Processing

Hasson et al, Talk: Thursday 15.30, Poster #151 W-AM

We demonstrate, similar to the known cortical hierarchy of spatial receptive fields, that there is a hierarchy of progressively longer temporal receptive windows in the human brain.

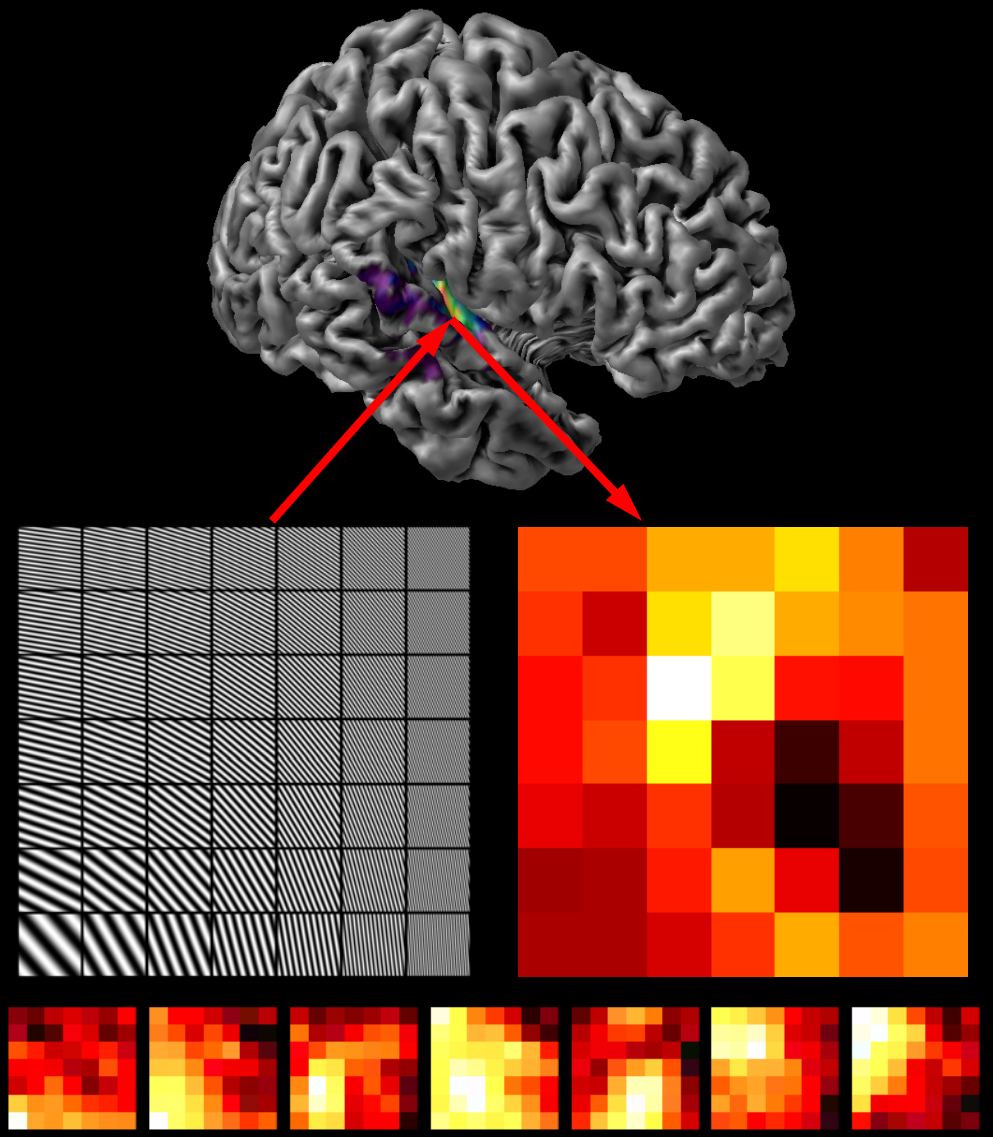




#188: Receptive fields of neuronal populations of the auditory cortex

Marc Schönwiesner & Robert Zatorre

TH-PM



Spectro-Temporal Modulation transfer functions of single voxels in the human auditory cortex were measured with high-resolution FMRI and dynamic ripple stimuli, adapting methods from animal neurophysiology.

#132
Th-PM

Social vs. Monetary Reward Processing in Typically Developing Children

A. Scott, S. Cox, D. Ghahremani, J. Cohen, R. Poldrack, M. Dapretto and S. Bookheimer
UCLA Center for Cognitive Neuroscience

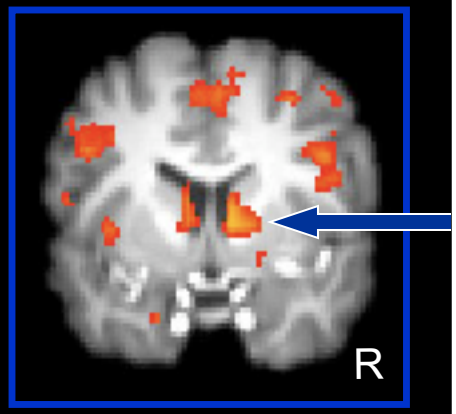
Rewards

Monetary

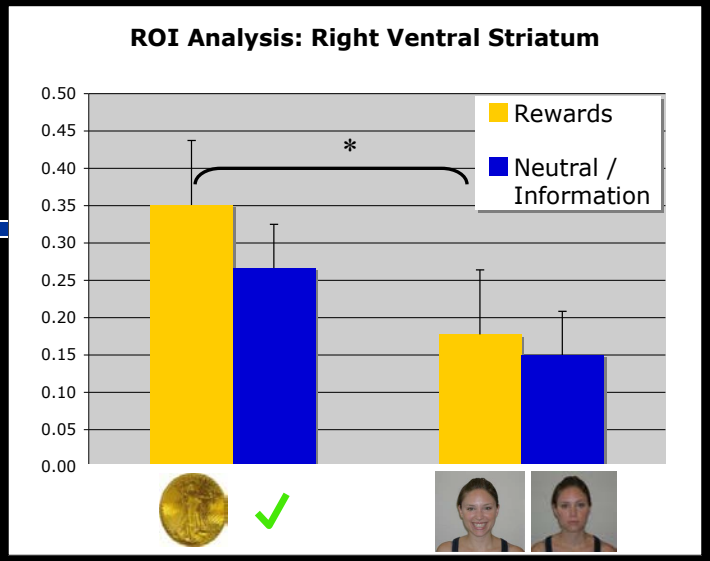
Social

Neutral

Correct ✓

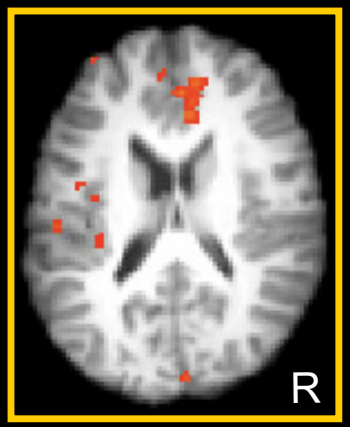


Reward-related Activity

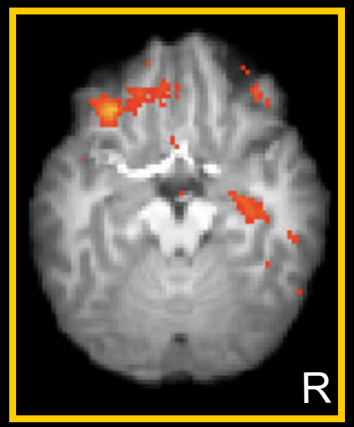


>

- Cingulate
- Ventrolateral PFC



z = +18



z = -20

>

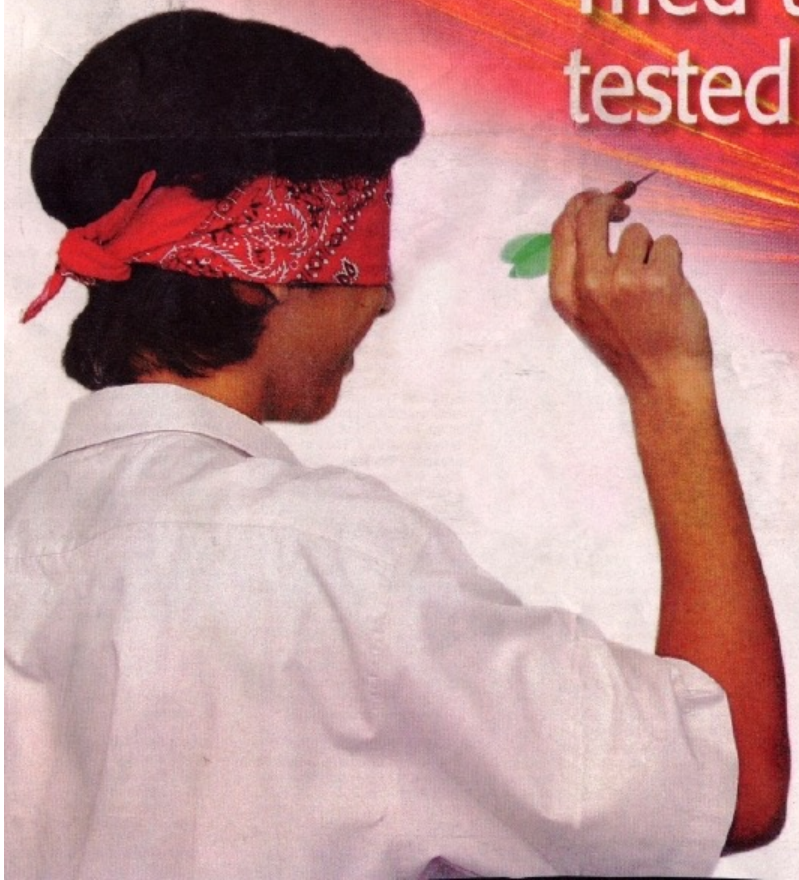
- Amygdala
- Medial PFC
- Orbital PFC

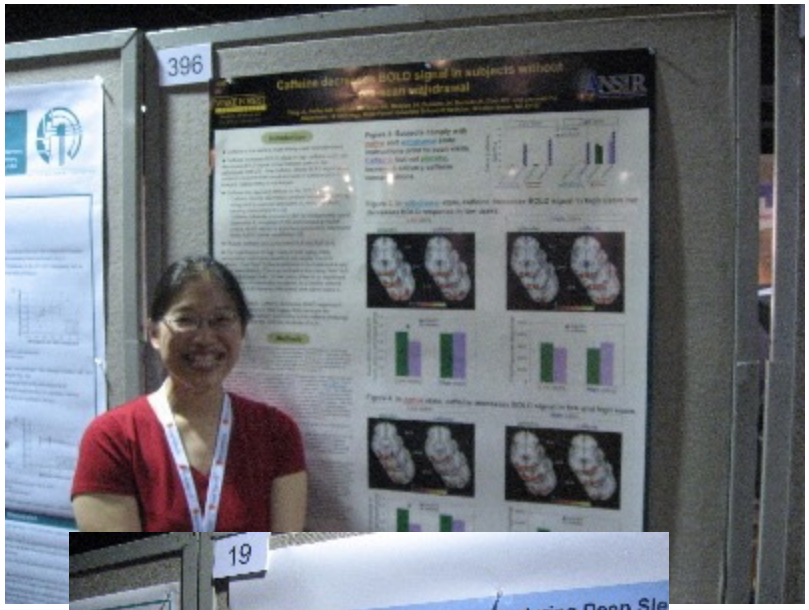
YQ

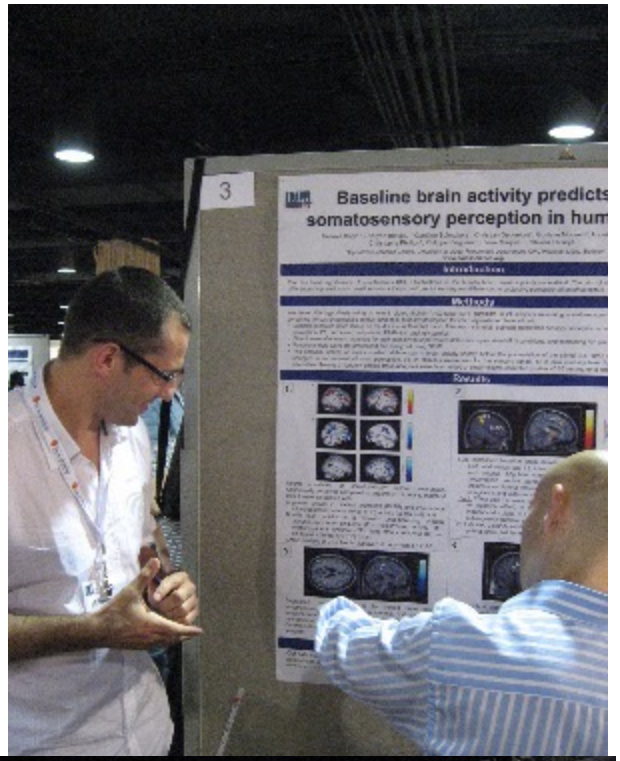
THURSDAY
SEPTEMBER 23, 2004

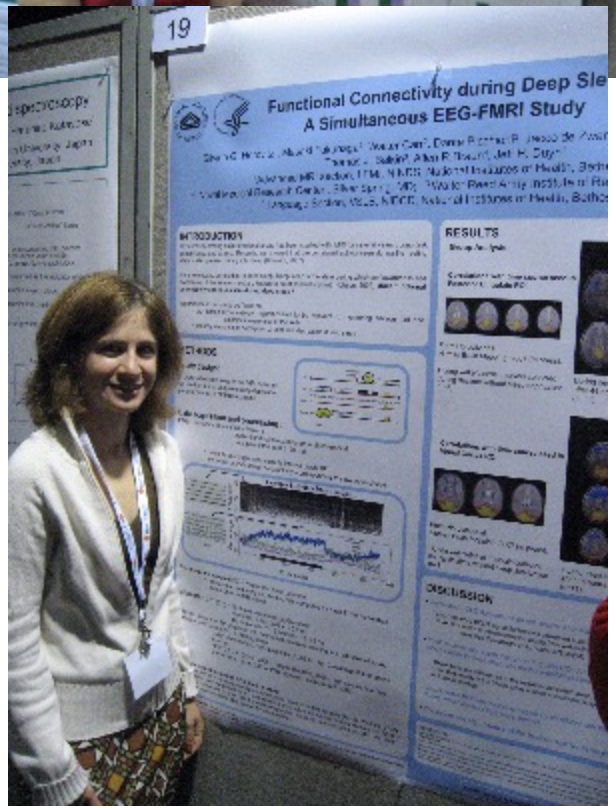
SPM MADE EASY

Tried and tested tips




396


3
Baseline brain activity predicts
somatosensory perception in hum


19
Functional Connectivity during Deep Sle
A Simultaneous EEG-FMRI Study
RESULTS

EGI

Speakers Dinner

Connor Anthony Bandettini

Thanks to…

Patrick Bellgowan
Rasmus Birn
Jerzy Bodurka
Niko Kriegeskorte
Sean Marrett
Kevin Murphy
Adam Thomas