JEAN-RÉMI KING

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Curriculum

Fundamental Artificial Intelligence Research (Meta)	*2018 –*
Senior Research scientist	
Brain & AI team leader	
CNRS, École Normale Supérieure	*2019 –*
Associate researcher	
Laboratoire des Systèmes Perceptifs	
Postdoc: New York University	*2015 – 2018*
Global Marie Curie Fellowship	
D. Poeppel & L. Melloni in collaboration with W. Singer (FIAS)	
Ph.D. Cognitive Neurosciences	*2010 – 2014*
Université Pierre & Marie Curie	
Advisors: S. Dehaene (Neurospin) & L. Naccache (ICM)	
Dual M.Sc. Brain & Mind Sciences	*2008 – 2010*
École Normale Supérieure & Université Pierre & Marie Curie	
University College London	
B.Sc. Psychology & Artificial Intelligence	*2005 – 2008*
University of Hertfordshire	

Funding & Awards

Fyssen Foundation Research grant	*2019*
William James Prize from Association for the Scientific Study of Consciousness	*2017*
Biomag: Young Investigator Award	*2016*
Cognitive Neuroscience Society: Postdoctoral Award	*2016*
Philippe Foundation Postdoctoral Award	*2016*
Marie Skłodowska Curie, Global Postdoctoral Fellowship	*2015 – 2018*
Bettencourt-Schueller Prize for Young Researchers	*2015*
Prix de thèse de la Chancellerie des Universités de Paris	*2015*
Franco-Swedish Prize for Young Researchers	*2013*
Ph.D. scholarship from the Direction Générale de l'Armement	*2010 – 2013*
Travel awards from the ASSC 15 & Brain	*2009 – 2011*
Prize of the jury of the M.Sc. University College London	*2009*
Three prizes of excellence from the University of Hertfordshire	*2005 – 2008*

Supervision & Management

Staff:	Research scientist: Hubert Banville	*2022 –*
	Research engineer: Joséphine Rogel, Corentin Bel	*2022 –*
	Research assistants: Larzabal, Kasdan, de Bruin, Lin, Meade	*2012 – 2017*
PhD students:	Linnea Evanson (co-supervised with P. Bourdillon), ENS / Rothschild Hospital	*2021*
	Pierre Orhan (co-supervised with Y. Boubenec), ENS	*2021*
	Charlotte Caucheteux (co-supervised with A. Gramfort), FAIR / INRIA	*2020*
	Théo Debordes (co-supervised with S. Dehaene), FAIR / CEA	*2019 – 2022*
	Laura Gwilliams (co-advisors: A. Marantz & D. Poeppel), NYU	*2016 – 2018*
Interns:	Juliette Millet (FAIR), Omar el Chebab (FAIR)	*2019 – 2021*
	Jason Phang (NYU), Niccolo Pescetelli (CEA)	*2013 – 2018*

Publications (4100 citations; H-index=28)

Zuanazzi, A. , Ripollés, P., Lin, W-M, Gwilliams, L., **King, J-R***, Poeppel, D.* (submitted) Tracking the online construction of linguistic meaning through negation.

Gwilliams, L., Flick, G., Marantz, A., Pylkkänen, L., Poeppel, **King, J-R** (under revision) MEG-MASC: a high-quality magneto-encephalography dataset for evaluating natural speech processing.

Desbordes, T., Lakretz, Y., Chanoine, V., Oquab, M., Badier, J-M, Trébuchon, A, Carron, R, Bénar, C-B, Dehaene, S., **King, J-R** (under revision) Dimensionality and ramping: Signatures of sentence integration in the dynamics of brains and deep language models.

Défossez, A., Caucheteux, C., Rapin, J., Kabyle, O., **King, J-R** (under revision) Decoding speech from non-invasive brain recordings.

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Gwilliams, L., Marantz, A., Poeppel, **King, J-R** (2023) Top-down information flow drives lexical access when listening to continuous speech, Language, Cognition and Neuroscience

Millet, J.*, Caucheteux, C.*, Orhan, P., Gramfort, A., Dunbar, E., Pallier, C., **King, J-R** (2023) Toward a realistic model of speech processing in the brain with self-supervised learning, Neurips

Caucheteux, C., Gramfort, A., **King, J-R** (2023) The cortical hierarchy makes long-range and high-level predictions during speech processing, Nature Human Behavior

Chehab, O.*, Défossez, A.*, Loiseau, J-C, Gramfort, A., **King, J-R** (2022) Deep Recurrent Encoder: an end-to-end network to model magnetoencephalography at scale, NBDT

Caucheteux, C., Gramfort, A., **King, J-R** (2022) Brains and algorithms partially converge in natural language processing, Nature Communications Biology

Orhan, P., Boubenec, Y., **King, J-R** (2022) Don't stop the training: continuously-updating self-supervised algorithms best account for auditory responses in the cortex, arXiv

Caucheteux, C., Gramfort, A., **King, J-R** (2022) Deep language algorithms predict semantic comprehension from brain activity, Nature Scientific Report

Caucheteux, C., Gramfort, A., **King, J-R** (2021) Model-based analysis of brain activity reveals the hierarchy of language in 305 subjects, EMNLP

Iemi, L. et al (2022) Ongoing neural oscillations influence behavior and sensory representations by suppressing neuronal excitability, Neuroimage

King, J-R & Wyart, V. (2021) The human brain encodes a chronicle of visual events at each instant of time through the multiplexing of traveling waves, Journal of Neuroscience

Caucheteux, C., Gramfort, A., **King, J-R** (2021) Disentangling syntax and semantics in the brain with deep networks, ICML 2022

Millet, J., **King, J-R** (2021) Inductive biases, pretraining and fine-tuning jointly account for brain responses to speech, arXiv

Lakretz, Y. Desbordes, T., **King, J-R**, Crabbé, B., Oquab, M., Dehaene, S (2021) Can RNNs learn Recursive Nested Subject-Verb Agreements? arXiv

Sergent, C., Corazzol, M., Labouret, G., Stockart, F., Wexler, M., **King, J-R**, Meyniel, F., Pressnitzer, D. (forthcoming) Bifurcation in brain dynamics reveals a signature of conscious processing independent of report, Nature Communication

Bourdillon, P., Hermann, B., Guénot, M. Bastuji, H. Isnard, J., **King, J-R**, Sitt, J., Naccache, N. (2020) Brain-scale cortico-cortical functional connectivity in the delta-theta band is a robust signature of conscious states: an intracranial and scalp EEG study, Scientific Reports

Gwilliams, L. & **King, J-R** (2020) Recurrent Processes Emulate a Cascade of Hierarchical Decisions: Evidence from Spatio-Temporal Decoding of Human Brain Activity, eLife

Peiffer-Smadja, N., Maatoug, R. , Lescure, F-X,D'Ortenzio, E., Pineau, J. & **King, J-R** (2020) Machine Learning for COVID-19 needs global collaboration and data-sharing, Nature Machine Intelligence

Lakretz, Y. , Dehaene, S. & **King, J-R** (2020) What Limits Our Capacity to Process Nested Long-Range Dependencies in Sentence Comprehension? Entropy 22 (4), 446

King, J-R, Charton, F., Lopez-Paz, D., Oquab, M. (2020) Discriminating the Influence of Correlated Factors from Multivariate Observations: the Back-to-Back Regression, Neuroimage

Claassen, J., Rohaut, B. et al (2019) Detection of brain activation in unresponsive patients with acute brain injury, New England Journal of Medicine

Quentin, R., **King, J-R**, et al (2019) Differential brain mechanisms of selection and maintenance of information during working memory, Journal of Neuroscience

King, J-R., Gwilliams, L., Holdgraf, C., Sassenhagen, J., Barachant, A., Engemann, D., Larson, E., Gramfort, A. (2019) Encoding and Decoding the Dynamics of Neural Responses: Methods to Uncover the Algorithms of Cognition, Book Chapter The Cognitive Neurosciences VII

Michel et al (2019) Opportunities and challenges for a maturing science of consciousness, Nature Human Behavior

Engemann, D., Raimondo, F., **King, J-R.**, et al (2018) Robust EEG-based cross-site and cross-protocol classification of states of consciousness, Brain

Barachant, A.* & **King, J-R*** (2017) Riemannian Geometry Boosts Representational Similarity Analyses of Dense Neural Time Series, Computational Cognitive Neuroscience

Kasdan, A., Poeppel, D., **King, J-R** (2017) Decoding of auditory sequences in working memory using MEG, Computational Cognitive Neuroscience

Trübutschek, D., Marti, S., Ojeda, A., **King, J-R**, Mi, Y., Tsodkys, M., Dehaene, S. (2017) A theory of working memory without consciousness or sustained activity, eLife

Cecotti, H., Barachant, A., **King, J-R**, Sanchez-Bornot, J., Prasad, G. (2017) Single-trial detection of event-related fields in MEG from the presentation of happy faces : Results of the Biomag 2016 data challenge, (691) EMBC'17

King, J-R.*, Pescetelli, N.*, Dehaene, S. (2016) Brain mechanisms underlying the brief maintenance of seen and unseen sensory information, Neuron

Naccache, L., Sitt, J., **King, J-R.**, Rohaut, B., Faugeras, F., Chennu, S., Strauss, M., Valente, M., Raimondo, F., Demertzi A., Bekinschtein, T., Dehaene, S., (2016) Reply: Replicability and impact of statistics in the detection of neural responses of consciousness, Brain, 139 (6), e31-e31

Dehaene, S., **King, J-R.**, (2016) Decoding the dynamics of conscious perception: The temporal generalization method, Chapter, Ipsen Fondation, pp 85-97 (Chapter, not peer reviewed).

Marti, S., **King, J-R.**, Dehaene, S. (2015) Time-Resolved Decoding of Two Processing Chains during Dual-Task Interference, Neuron, 16; 88(6):1297-307

Hermes-Miller, D., Rangarajan, V., Foster, B., **King, J-R.**, Kasikci, I., Miller, K., Parvizi, J. (accepted) Electrophysiological responses in the ventral temporal cortex during reading of numerals and calculation, Cerebral Cortex

Naccache, L., **King, J-R.**, Sitt, S., Engemann, D., El Karoui, I., Rohaut, B., Faugeras, Chennu, S., Strauss, M., Bekinschtein T., Dehaene, S., (2015) Neural detection of complex sound sequences or of statistical regularities in the absence of consciousness? Brain, 138 (12), e395-e395

Salti, M. Monto, M., Charles, L., **King, J-R.**, Parkkonen, L. Dehaene, S. (2015) Distinct cortical codes and temporal dynamics for conscious and unconscious percepts, eLIFE

Strauss, M. Sitt, J.D., **King, J-R.**, Elbaz M., Azizi, L., Buiatti, M., Naccache L., van Wassenhove, V., Dehaene, S., (2015) Disruption of hierarchical predictive coding during sleep, PNAS

Rohaut, B., Faugeras, F., Chausson, N., **King, J-R.**, El Karoui, I., Cohen, L., Naccache, L. (2014) Probing ERP correlates of verbal semantic processing in patients with impaired consciousness, Neuropsychologia.

Konstantinou, N., Beal, E., **King, J-R.**, Lavie, N. (2014) Working memory load and distraction: Dissociable effects of visual maintenance and cognitive control, Attention Perception & Psychophysics

El Karoui,I., **King, J-R.**, Sitt, J.D., Meyniel, F., van Gaal, S., Hasboun, D., Adam, A., Navarro, V., Baulac, M., Dehaene, S., Cohen, L., Naccache, L. (2014) Oscillatory and functional-connectivity facets of the MMN and P300: an intracranial study in humans, Cerebral Cortex

Sitt, J.D.*, **King, J-R.***, El Karoui, I., Rohaut, B., Faugeras,F., Gramfort, A., Cohen, L., Sigman, M., Dehaene, S., Naccache,L., (2014) Large scale screening of the neural signatures of consciousness in vegetative and minimally conscious state patients, Brain

King, J-R., Dehaene, S. (2014) A model of subjective report and objective discrimination as categorical decisions in a vast representational space, Philosophical Transactions of the Royal Society B: Biological Sciences, 369(1641): 2013020

King, J-R., Dehaene, S. (2014) Characterizing the dynamics of mental representations: the temporal generalization method, Trends in Cognitive Sciences

King, J-R., Gramfort, A., Schurger, A., Naccache, L., Dehaene, S. (2014) Two distinct dynamic modes subtend the detection of unexpected sounds, PLoS One

Charles, L., **King, J-R.**, Dehaene, S. (2014) Decoding the dynamics of action, intention, and error-detection for conscious and subliminal stimuli, The Journal of Neuroscience 34(4):1158–1170,

Dehaene, S., Charles, L., **King, J-R.**, Marti, S. (2014) Toward a computational theory of conscious processing, Current Opinion in Neurobiology 25: 76-84

King, J-R.*, Sitt, J.D.*, Faugeras, F., Rohaut, B., El Karoui, I., Cohen, L., Naccache, L., Dehaene, S., (2013) Information sharing in the brain indexes consciousness in noncommunicative patients, Current Biology, 23(19): 1914-1919

Sitt, J.D., **King, J-R.**, Naccache, L., Dehaene, S., (2013) Ripples of Consciousness, Trends in Cognitive Sciences, 17(11): 552-554,

King, J-R., Faugeras, F., Gramfort, A., Schurger, A., El Karoui, I., Sitt, J.D., Rohaut, B., Wacongne, C., Labyt, E., Bekinschtein, T., Cohen, L., Naccache, L., Dehaene, S., (2013) Single-trial decoding of auditory novelty responses facilitates the detection of residual consciousness, Neuroimage, 83: 726-738,

Sheynikhovich, D., Grèzes, F., **King, J-R.**, Arleo, A. (2012) Exploratory behaviour depends on multisensory integration during spatial learning, Artificial Neural Networks and Machine Learning, 7552: 296-303,

King, J-R., Bekinschtein, T., Dehaene, S. (2011) Technical comment on “Preserved Feedforward But Impaired Top-Down Processes in the Vegetative State”, Science, 334(6060): 1203

* The authors contributed equally to the work