JEAN-RÉMI KING

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CURRICULUM

Fundamental Artificial Intelligence Research (Meta)	*2018 –*
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	
S. Dehaene (CEA) & 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, <u>Language, Cognition and Neuroscience</u>

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, <u>Neurips</u>

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, <u>NBDT</u>

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

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, <u>arXiv</u>

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

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

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

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, <u>Journal of Neuroscience</u>

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

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

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

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, <u>Nature Communication</u>

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, <u>Scientific Reports</u>

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

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, <u>Nature Machine Intelligence</u>

Lakretz, Y. , Dehaene, S. & **King, J-R** (2020) What Limits Our Capacity to Process Nested Long-Range Dependencies in Sentence Comprehension? <u>Entropy</u> 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, <u>Neuroimage</u>

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

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

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 <u>The Cognitive Neurosciences VII</u>

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

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

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

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

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, <u>eLife</u>

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) <u>EMBC'17</u>

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

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, <u>Brain</u>, 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, <u>Neuron,</u> 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, <u>Cerebral Cortex</u>

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? <u>Brain</u>, 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