

Stanford



Kaustubh Supekar

Clinical Associate Professor, Psychiatry and Behavioral Sciences

Bio

ACADEMIC APPOINTMENTS

- Clinical Associate Professor, Psychiatry and Behavioral Sciences
- Member, Wu Tsai Human Performance Alliance
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Wu Tsai Neurosciences Institute

PROFESSIONAL EDUCATION

- Ph.D., Stanford University School of Medicine
- Entrepreneurship, Stanford Graduate School of Business

Teaching

COURSES

2023-24

- Artificial Intelligence in Mental Health: PSYC 63Q (Spr)

2022-23

- Artificial Intelligence in Mental Health: PSYC 63Q (Spr)

2021-22

- Artificial Intelligence in Mental Health: PSYC 63Q (Spr)

Publications

PUBLICATIONS

- **Integrative Brain Network and Salience Models of Psychopathology and Cognitive Dysfunction in Schizophrenia.** *Biological psychiatry* Menon, V., Palaniyappan, L., Supekar, K. 2022
- **Robust, Generalizable, and Interpretable Artificial Intelligence-Derived Brain Fingerprints of Autism and Social Communication Symptom Severity.** *Biological psychiatry* Supekar, K., Ryali, S., Yuan, R., Kumar, D., de Los Angeles, C., Menon, V. 2022
- **Deep learning identifies robust gender differences in functional brain organization and their dissociable links to clinical symptoms in autism.** *The British journal of psychiatry : the journal of mental science*

Supekar, K., de Los Angeles, C., Ryali, S., Cao, K., Ma, T., Menon, V.

2022; 1-8

- **Aberrant dynamics of cognitive control and motor circuits predict distinct restricted and repetitive behaviors in children with autism.** *Nature communications*

Supekar, K., Ryali, S., Mistry, P., Menon, V.

2021; 12 (1): 3537

- **Dysregulated Brain Dynamics in a Triple-Network Saliency Model of Schizophrenia and Its Relation to Psychosis.** *Biological psychiatry*

Supekar, K., Cai, W., Krishnadas, R., Palaniyappan, L., Menon, V.

2018

- **Deficits in mesolimbic reward pathway underlie social interaction impairments in children with autism.** *Brain : a journal of neurology*

Supekar, K., Kochalka, J., Schaer, M., Wakeman, H., Qin, S., Padmanabhan, A., Menon, V.

2018

- **Sex differences in structural organization of motor systems and their dissociable links with repetitive/restricted behaviors in children with autism** *MOLECULAR AUTISM*

Supekar, K., Menon, V.

2015; 6

- **Brain hyperconnectivity in children with autism and its links to social deficits.** *Cell reports*

Supekar, K., Uddin, L. Q., Khouzam, A., Phillips, J., Gaillard, W. D., Kenworthy, L. E., Yerys, B. E., Vaidya, C. J., Menon, V.

2013; 5 (3): 738-747

- **Developmental Maturation of Dynamic Causal Control Signals in Higher-Order Cognition: A Neurocognitive Network Model** *PLOS COMPUTATIONAL BIOLOGY*

Supekar, K., Menon, V.

2012; 8 (2)

- **Dynamic reconfiguration of structural and functional connectivity across core neurocognitive brain networks with development.** *Journal of Neuroscience*

Supekar, K., Lucina Q., U., Ryali, S., Vinod , M.

2011; 31 (50): 18578-89

- **Development of functional and structural connectivity within the default mode network in young children** *NEUROIMAGE*

Supekar, K., Uddin, L. Q., Prater, K., Amin, H., Greicius, M. D., Menon, V.

2010; 52 (1): 290-301

- **Development of Large-Scale Functional Brain Networks in Children** *PLOS BIOLOGY*

Supekar, K., Musen, M., Menon, V.

2009; 7 (7)

- **Network analysis of intrinsic functional brain connectivity in Alzheimer's disease** *PLOS COMPUTATIONAL BIOLOGY*

Supekar, K., Menon, V., Rubin, D., Musen, M., Greicius, M. D.

2008; 4 (6)

- **Deep learning models reveal replicable, generalizable, and behaviorally relevant sex differences in human functional brain organization.** *Proceedings of the National Academy of Sciences of the United States of America*

Ryali, S., Zhang, Y., de Los Angeles, C., Supekar, K., Menon, V.

2024; 121 (9): e2310012121

- **The Effects of Methylphenidate on Spontaneous Fluctuations in Reward and Cognitive Control Networks in Children With Attention-Deficit/Hyperactivity Disorder -Randomized Controlled Studies in Two Independent Cohorts**

Mizuno, Y., Cai, W., Supekar, K., Makita, K., Takiguchi, S., Silk, T. J., Tomoda, A., Menon, V.
ELSEVIER SCIENCE INC.2023: S103

- **Methylphenidate Enhances Spontaneous Fluctuations in Reward and Cognitive Control Networks in Children With Attention-Deficit/Hyperactivity Disorder.** *Biological psychiatry. Cognitive neuroscience and neuroimaging*

Mizuno, Y., Cai, W., Supekar, K., Makita, K., Takiguchi, S., Silk, T. J., Tomoda, A., Menon, V.

2022

- **Methylphenidate remediates aberrant brain network dynamics in children with attention-deficit/hyperactivity disorder: a randomized controlled trial.** *NeuroImage*
Mizuno, Y., Cai, W., Supekar, K., Makita, K., Takiguchi, S., Tomoda, A., Menon, V.
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- **Methylphenidate Enhances Spontaneous Fluctuations in Reward and Cognitive Control Networks in Children With Attention-Deficit/Hyperactivity Disorder: A Randomized Control Trial**
Mizuno, Y., Cai, W., Supekar, K., Makita, K., Takiguchi, S., Tomoda, A., Menon, V.
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- **Developmental Maturation of Causal Signaling Hubs in Voluntary Control of Saccades and Their Functional Controllability.** *Cerebral cortex (New York, N.Y. : 1991)*
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- **mTOR-related synaptic pathology causes autism spectrum disorder-associated functional hyperconnectivity.** *Nature communications*
Pagani, M., Barsotti, N., Bertero, A., Trakoshis, S., Ulysse, L., Locarno, A., Miseviciute, I., De Felice, A., Canella, C., Supekar, K., Galbusera, A., Menon, V., Tonini, et al
2021; 12 (1): 6084
- **Identification of robust and interpretable brain signatures of autism and clinical symptom severity using a dynamic time-series deep neural network**
Supekar, K., Ryali, S., Yuan, R., Kumar, D., Angeles, C., Menon, V.
CAMBRIDGE UNIV PRESS.2021: S145
- **Neurocognitive modeling of latent memory processes reveals reorganization of hippocampal-cortical circuits underlying learning and efficient strategies.** *Communications biology*
Supekar, K., Chang, H., Mistry, P. K., Iuculano, T., Menon, V.
2021; 4 (1): 405
- **Effects of Methylphenidate on Aberrant Brain Network Dynamics in Children With Attention-Deficit/Hyperactivity Disorder: A Randomized Controlled Clinical Trial**
Mizuno, Y., Cai, W., Supekar, K., Makita, K., Takiguchi, S., Tomoda, A., Menon, V.
2021: S108
- **Aberrant Time-Varying Cross-Network Interactions in Children With Attention-Deficit/Hyperactivity Disorder and the Relation to Attention Deficits.** *Biological psychiatry. Cognitive neuroscience and neuroimaging*
Cai, W., Chen, T., Szegletes, L., Supekar, K., Menon, V.
2018; 3 (3): 263–73
- **Bayesian Switching Factor Analysis for Estimating Time-varying Functional Connectivity in fMRI.** *NeuroImage*
Taghia, J., Ryali, S., Chen, T., Supekar, K., Cai, W., Menon, V.
2017
- **The influence of sex and age on prevalence rates of comorbid conditions in autism.** *Autism research*
Supekar, K., Iyer, T., Menon, V.
2017
- **Reconfiguration of parietal circuits with cognitive tutoring in elementary school children.** *Cortex; a journal devoted to the study of the nervous system and behavior*
Jolles, D., Supekar, K., Richardson, J., Tenison, C., Ashkenazi, S., Rosenberg-Lee, M., Fuchs, L., Menon, V.
2016; 83: 231-245
- **Multivariate dynamical systems-based estimation of causal brain interactions in fMRI: Group-level validation using benchmark data, neurophysiological models and human connectome project data** *JOURNAL OF NEUROSCIENCE METHODS*
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2016; 268: 142-153
- **Large-scale intrinsic functional network organization along the long axis of the human medial temporal lobe.** *Brain structure & function*
Qin, S., Duan, X., Supekar, K., Chen, H., Chen, T., Menon, V.
2016; 221 (6): 3237-3258

- **Parietal hyper-connectivity, aberrant brain organization, and circuit-based biomarkers in children with mathematical disabilities** *DEVELOPMENTAL SCIENCE*
Jolles, D., Ashkenazi, S., Kochalka, J., Evans, T., Richardson, J., Rosenberg-Lee, M., Zhao, H., Supekar, K., Chen, T., Menon, V.
2016; 19 (4): 613-631
- **Distinct Global Brain Dynamics and Spatiotemporal Organization of the Salience Network** *PLOS BIOLOGY*
Chen, T., Cai, W., Ryali, S., Supekar, K., Menon, V.
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- **Combining optogenetic stimulation and fMRI to validate a multivariate dynamical systems model for estimating causal brain interactions** *NEUROIMAGE*
Ryali, S., Shih, Y. I., Chen, T., Kochalka, J., Albaugh, D., Fang, Z., Supekar, K., Lee, J. H., Menon, V.
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- **Plasticity of left perisylvian white-matter tracts is associated with individual differences in math learning.** *Brain structure & function*
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- **Temporal dynamics and developmental maturation of salience, default and central-executive network interactions revealed by variational Bayes hidden markov modeling** *PLOS COMPUTATIONAL BIOLOGY*
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2016; 12 (12)
- **Brain State Differentiation and Behavioral Inflexibility in Autism[†].** *Cerebral cortex*
Uddin, L. Q., Supekar, K., Lynch, C. J., Cheng, K. M., Odriozola, P., Barth, M. E., Phillips, J., Feinstein, C., Abrams, D. A., Menon, V.
2015; 25 (12): 4740-4747
- **Remediation of Childhood Math Anxiety and Associated Neural Circuits through Cognitive Tutoring.** *Journal of neuroscience*
Supekar, K., Iuculano, T., Chen, L., Menon, V.
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- **Sex differences in cortical volume and gyration in autism** *MOLECULAR AUTISM*
Schaer, M., Kochalka, J., Padmanabhan, A., Supekar, K., Menon, V.
2015; 6
- **Role of the anterior insular cortex in integrative causal signaling during multisensory auditory-visual attention.** *European journal of neuroscience*
Chen, T., Michels, L., Supekar, K., Kochalka, J., Ryali, S., Menon, V.
2015; 41 (2): 264-274
- **Aberrant Cross-Brain Network Interaction in Children With Attention-Deficit/Hyperactivity Disorder and Its Relation to Attention Deficits: A Multisite and Cross-Site Replication Study.** *Biological psychiatry*
Cai, W. n., Chen, T. n., Szegletes, L. n., Supekar, K. n., Menon, V. n.
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- **Cognitive tutoring induces widespread neuroplasticity and remediates brain function in children with mathematical learning disabilities.** *Nature communications*
Iuculano, T., Rosenberg-Lee, M., Richardson, J., Tenison, C., Fuchs, L., Supekar, K., Menon, V.
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- **Cognitive tutoring induces widespread neuroplasticity and remediates brain function in children with mathematical learning disabilities.** *Nature communications*
Iuculano, T., Rosenberg-Lee, M., Richardson, J., Tenison, C., Fuchs, L., Supekar, K., Menon, V.
2015; 6: 8453-?
- **Sex differences in cortical volume and gyration in autism.** *Molecular autism*
Schaer, M., Kochalka, J., Padmanabhan, A., Supekar, K., Menon, V.
2015; 6: 42-?
- **Amygdala subregional structure and intrinsic functional connectivity predicts individual differences in anxiety during early childhood.** *Biological psychiatry*
Qin, S., Young, C. B., Duan, X., Chen, T., Supekar, K., Menon, V.

2014; 75 (11): 892-900

● **A Robust Classifier to Distinguish Noise from fMRI Independent Components** *PLOS ONE*

Sochat, V., Supekar, K., Bustillo, J., Calhoun, V., Turner, J. A., Rubin, D. L.
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● **Brain Organization Underlying Superior Mathematical Abilities in Children with Autism** *BIOLOGICAL PSYCHIATRY*

Iuculano, T., Rosenberg-Lee, M., Supekar, K., Lynch, C. J., Khouzam, A., Phillips, J., Uddin, L. Q., Menon, V.
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● **A robust classifier to distinguish noise from fMRI independent components.** *PloS one*

Sochat, V., Supekar, K., Bustillo, J., Calhoun, V., Turner, J. A., Rubin, D. L.
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● **Reconceptualizing functional brain connectivity in autism from a developmental perspective** *FRONTIERS IN HUMAN NEUROSCIENCE*

Uddin, L. Q., Supekar, K., Menon, V.
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● **Salience Network-Based Classification and Prediction of Symptom Severity in Children With Autism** *JAMA PSYCHIATRY*

Uddin, L. Q., Supekar, K., Lynch, C. J., Khouzam, A., Phillips, J., Feinstein, C., Ryali, S., Menon, V.
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● **Default Mode Network in Childhood Autism: Posteromedial Cortex Heterogeneity and Relationship with Social Deficits** *BIOLOGICAL PSYCHIATRY*

Lynch, C. J., Uddin, L. Q., Supekar, K., Khouzam, A., Phillips, J., Menon, V.
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● **Underconnectivity between voice-selective cortex and reward circuitry in children with autism** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*

Abrams, D. A., Lynch, C. J., Cheng, K. M., Phillips, J., Supekar, K., Ryali, S., Uddin, L. Q., Menon, V.
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● **Neural predictors of individual differences in response to math tutoring in primary-grade school children.** *Proceedings of the National Academy of Sciences of the United States of America*

Supekar, K., Swigart, A. G., Tenison, C., Jolles, D. D., Rosenberg-Lee, M., Fuchs, L., Menon, V.
2013; 110 (20): 8230-8235

● **A parcellation scheme based on von Mises-Fisher distributions and Markov random fields for segmenting brain regions using resting-state fMRI** *NEUROIMAGE*

Ryali, S., Chen, T., Supekar, K., Menon, V.
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● **Reconceptualizing functional brain connectivity in autism from a developmental perspective.** *Frontiers in human neuroscience*

Uddin, L. Q., Supekar, K., Menon, V.
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● **NDAR: A Model Federal System for Secondary Analysis in Developmental Disabilities Research** *USING SECONDARY DATASETS TO UNDERSTAND PERSONS WITH DEVELOPMENTAL DISABILITIES AND THEIR FAMILIES*

Novikova, S. I., RICHMAN, D. M., Supekar, K., Barnard-Brak, L., Hall, D.
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● **Immature integration and segregation of emotion-related brain circuitry in young children** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*

Qin, S., Young, C. B., Supekar, K., Uddin, L. Q., Menon, V.
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● **Estimation of functional connectivity in fMRI data using stability selection-based sparse partial correlation with elastic net penalty** *NEUROIMAGE*

Ryali, S., Chen, T., Supekar, K., Menon, V.
2012; 59 (4): 3852-3861

● **Multivariate dynamical systems models for estimating causal interactions in fMRI** *NEUROIMAGE*

Ryali, S., Supekar, K., Chen, T., Menon, V.

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- **Dissociable Connectivity within Human Angular Gyrus and Intraparietal Sulcus: Evidence from Functional and Structural Connectivity** *CEREBRAL CORTEX*

Uddin, L. Q., Supekar, K., Amin, H., Rykhlevskaia, E., Nguyen, D. A., Greicius, M. D., Menon, V.
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- **The caBIG (TM) Annotation and Image Markup Project** *JOURNAL OF DIGITAL IMAGING*

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- **Resting-State Functional Connectivity Reflects Structural Connectivity in the Default Mode Network** *CEREBRAL CORTEX*

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- **Knowledge Zone: A Public Repository of Peer-Reviewed Biomedical Ontologies** *12th World Congress on Health (Medical) Informatics*

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- **Extracting Subject Demographic Information From Abstracts of Randomized Clinical Trial Reports** *12th World Congress on Health (Medical) Informatics*

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- **Ontology integration: Experience with medical terminologies** *COMPUTERS IN BIOLOGY AND MEDICINE*

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- **Ontology-based annotation and query of tissue microarray data.** *AMIA ... Annual Symposium proceedings / AMIA Symposium. AMIA Symposium*

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- **Combining text classification and Hidden Markov Modeling techniques for categorizing sentences in randomized clinical trial abstracts.** *AMIA ... Annual Symposium proceedings / AMIA Symposium. AMIA Symposium*

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- **Representing lexical components of medical terminologies in OWL.** *AMIA ... Annual Symposium proceedings / AMIA Symposium. AMIA Symposium*

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- **Ontology metadata to support the building of a library of biomedical ontologies.** *AMIA ... Annual Symposium proceedings / AMIA Symposium. AMIA Symposium*

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- **Provisioning resilient, adaptive Web Services-based workflow: A semantic modeling approach** *IEEE INTERNATIONAL CONFERENCE ON WEB SERVICES, PROCEEDINGS*
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- **A QoS oriented framework for adaptive management of web service based workflows** *DATABASE AND EXPERT SYSTEMS APPLICATIONS, PROCEEDINGS*
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- **Ontology based metadata management in medical domains** *JOURNAL OF RESEARCH AND PRACTICE IN INFORMATION TECHNOLOGY*
Chong, Q., Marwadi, A., Supekar, K., Lee, Y.
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- **Fuzzy rule-based framework for medical record validation** *INTELLIGENT DATA ENGINEERING AND AUTOMATED LEARNING - IDEAL 2002*
Supekar, K., Marwadi, A., Lee, Y., Medhi, D.
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