Stanford



Daniel A. Abrams

Clinical Associate Professor, Psychiatry and Behavioral Sciences - Interdisciplinary Brain Sciences

Curriculum Vitae available Online

Bio

BIO

Dr. Abrams is a Clinical Associate Professor in the Department of Psychiatry and Behavioral Sciences at Stanford University where he conducts research investigating the brain bases of social communication impairments in children with autism spectrum disorders (ASD). Dr. Abrams research focuses on understanding why children with ASD often "tune out" from the social world around them and how this impacts social and brain development. His research employs a combination of psychophysical, cognitive, and brain imaging techniques, with the goal of identifying key neural features underlying social deficits in children with ASD.

Dr. Abrams received his undergraduate degree from University of Arizona followed by a period in industry as an acoustical engineer in the San Francisco Bay Area. He subsequently completed his graduate degree from Northwestern University and joined the Stanford University community as a postdoctoral researcher in 2008. Dr. Abrams joined the Stanford faculty in 2014 and was promoted to Clinical Assistant Professor in 2018 and Clinical Associate Professor in 2021.

Dr. Abrams's research program has been supported by multiple funding agencies including the NIH, NARSAD, and the National Organization for Hearing Research Foundation.

ACADEMIC APPOINTMENTS

- Clinical Associate Professor, Psychiatry and Behavioral Sciences - Interdisciplinary Brain Sciences
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Sex differences in voice processing systems in autism, Brain and Behavior Research Foundation (NARSAD) (2019–2021)
- Connectivity of voice processing brain networks in female children with autism, Stanford Women and Sex Differences in Medicine (2017–2018)
- CHRI Pilot Early Career Award, Lucile Packard Foundation for Children's Health (2017)
- K01 Research Scientist Development Award, NIMH, NIH/NIMH (2014-2017)
- Postdoctoral National Research Service Award, NIH/NIDCD (2010-2012)
- Independence Blue Cross Grant in Auditory Science Award, National Organization for Hearing Research Foundation (2006)
- Research Training in Neuroscience, NIH/NIDCD (2002-2003)
- Graduate Fellowship, Northwestern University (2000-2001)

PROFESSIONAL EDUCATION

- Ph.D., Northwestern University , Auditory Cognitive Neuroscience (2008)
- B.F.A., University of Arizona (1994)

LINKS

- Speech and Social Neuroscience Lab: https://med.stanford.edu/sasnl.html
- Stanford Cognitive and Systems Neuroscience Laboratory: https://med.stanford.edu/scsnl.html
- Center for Computer Research in Music and Acoustics (CCRMA): https://ccrma.stanford.edu/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Autism spectrum disorders (ASD) are among the most pervasive neurodevelopmental disorders and are characterized by significant deficits in social communication. A common observation in children with ASD is that affected individuals often “tune out” from social interactions, which likely impacts the development of social, communication, and language skills. My primary research goals are to understand why children with ASD often tune out from the social world and how this impacts social skill and brain development, and to identify remediation strategies that motivate children with ASD to engage in social interactions. The theoretical framework that guides my work is that social impairments in ASD stem from a primary deficit in identifying social stimuli, such as human voices and faces, as rewarding and salient stimuli, thereby precluding children with ASD from engaging with these stimuli.

My program of research has provided important information regarding the brain circuits underlying social deficits in ASD. Importantly, these findings have consistently implicated key structures of the brain’s reward and salience processing systems, and support the hypothesis that impaired reward attribution to social stimuli is a critical aspect of social difficulties in ASD.

My lab is currently conducting three research studies:

Speaker-Listener Coupling and Brain Dynamics During Naturalistic Verbal Communication in Children with Autism
We have a new study investigating how the brain processes and understands speech in children with Autism Spectrum Disorder as well as typically developing children. We are interested in understanding speech comprehension in children through anticipating incoming speech and accumulating speech information over a period of time.

Speaker-Listener Coupling and Brain Dynamics During Naturalistic Verbal Communication in Alzheimer’s Disease
In collaboration with the Alzheimer’s Disease Research Center, our new study is exploring how the brain enables us to understand speech, with a focus on both healthy older adults and adults with Alzheimer’s Disease. We also aim to understand how the brain measures seen while we listen and understand a story are linked to language skills in these individuals.

Pivotal Response Treatment for Adolescents with High Functioning Autism Intervention Study
This is a 9-week intervention focusing on key social skills for autistic adolescents, while exploring brain plasticity using fMRI imaging. Your child will receive 1:1 sessions with our clinician, with parent training in clinic. Topics include: Greetings, Departures, Question Asking, Talking the Right Amount, Empathy, Sarcasm, and Eating and Drinking. We also coordinate with the school for additional support and opportunities to practice the targeted social skills in a club of interest.

CLINICAL TRIALS

- PRT for Adolescents With High Functioning Autism, Recruiting

Publications

PUBLICATIONS

- **Developmental divergence in voice-reward circuitry differentiates autistic from typically developing children and adolescents.** *Proceedings of the National Academy of Sciences of the United States of America*
  Abrams, D. A., Leipold, S., Odriozola, P., Baker, A. E., Padmanabhan, A., Phillips, J. M., Menon, V.
  2026; 123 (29): e2601227123

- **A dysfunctional hub model of voice-reward integration in autism.** *Trends in cognitive sciences*
  Abrams, D. A., Leipold, S., Bowling, D. L.
  2026

- **A neurodevelopmental shift in reward circuitry from mother's to nonfamilial voices in adolescence.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*
  Abrams, D. A., Mistry, P. K., Baker, A. E., Padmanabhan, A., Menon, V.
  2022

- **Impaired voice processing in reward and salience circuits predicts social communication in children with autism.** *eLife*
  Abrams, D. A., Padmanabhan, A., Chen, T., Odriozola, P., Baker, A. E., Kochalka, J., Phillips, J. M., Menon, V.
  2019; 8

- **Neural circuits underlying mother's voice perception predict social communication abilities in children** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Abrams, D. A., Chen, T., Odriozola, P., Cheng, K. M., Baker, A. E., Padmanabhan, A., Ryali, S., Kochalka, J., Feinstein, C., Menon, V.
  2016; 113 (22): 6295-6300

- **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.
  2013; 110 (29): 12060-12065

- **Improving Social Communication in Autistic Adolescents Through a Clinic-Home-School Collaboration.** *Journal of autism and developmental disorders*
  Koegel, L. K., Abrams, D. A., Tran, T. N., Koegel, R. L.
  2024

- **Atypical pattern separation memory and its association with restricted interests and repetitive behaviors in autistic children.** *Autism : the international journal of research and practice*
  Chen, L., Liu, J., Kang, J. B., Rosenberg-Lee, M., Abrams, D. A., Menon, V.
  2024: 13623613231223354

- **Atypical cognitive training-induced learning and brain plasticity and their relation to insistence on sameness in children with autism.** *eLife*
  Liu, J., Chang, H., Abrams, D. A., Kang, J. B., Lang, C., Rosenberg-Lee, M., Menon, V.
  2023; 12

- **Replicable patterns of memory impairments in children with autism and their links to hyperconnected brain circuits.** *Biological psychiatry. Cognitive neuroscience and neuroimaging*
  Liu, J., Chen, L., Chang, H., Rudoler, J., Belal Ai-Zughoul, A., Kang, J. B., Abrams, D. A., Menon, V.
  2023

- **Aberrant Emotional Prosody Circuitry Predicts Social Communication Impairments in Children With Autism.** *Biological psychiatry. Cognitive neuroscience and neuroimaging*
  Leipold, S., Abrams, D. A., Karraker, S., Phillips, J. M., Menon, V.
  2022

- **Neural decoding of emotional prosody in voice-sensitive auditory cortex predicts social communication abilities in children.** *Cerebral cortex (New York, N.Y. : 1991)*
  Leipold, S., Abrams, D. A., Karraker, S., Menon, V.
  2022
- **Epidural labour analgesia and autism spectrum disorder: is the current evidence sufficient to dismiss an association?** *BRITISH JOURNAL OF ANAESTHESIA*
  Butwick, A. J., Abrams, D. A., Wong, C. A.
  2022; 128 (3): 393-398
- **Mothers adapt their voice during children's adolescent development.** *Scientific reports*
  Leipold, S., Abrams, D. A., Menon, V.
  1800; 12 (1): 951
- **Intrinsic functional architecture of the human speech processing network.** *Cortex; a journal devoted to the study of the nervous system and behavior*
  Abrams, D. A., Kochalka, J. n., Bhide, S. n., Ryali, S. n., Menon, V. n.
  2020; 129: 41–56
- **A Pivotal Response Treatment Package for Children With Autism Spectrum Disorder: An RCT.** *Pediatrics*
  Gengoux, G. W., Abrams, D. A., Schuck, R., Millan, M. E., Libove, R., Ardel, C. M., Phillips, J. M., Fox, M., Frazier, T. W., Hardan, A. Y.
  2019
- **Quantitative Analysis of Heterogeneity in Academic Achievement of Children With Autism** *CLINICAL PSYCHOLOGICAL SCIENCE*
  Chen, L., Abrams, D. A., Rosenberg-Lee, M., Iuculano, T., Wakeman, H. N., Prathap, S., Chen, T., Menon, V.
  2019; 7 (2): 362–80
- **The visual word form area (VWFA) is part of both language and attention circuitry.** *Nature communications*
  Chen, L. n., Wassermann, D. n., Abrams, D. A., Kochalka, J. n., Gallardo-Diez, G. n., Menon, V. n.
  2019; 10 (1): 5601
- **Neural signatures of co-occurring reading and mathematical difficulties.** *Developmental science*
  Skeide, M. A., Evans, T. M., Mei, E. Z., Abrams, D. A., Menon, V.
  2018: e12680
- **Individual Differences in Human Auditory Processing: Insights From Single-Trial Auditory Midbrain Activity in an Animal Model.** *Cerebral cortex (New York, N.Y. : 1991)*
  White-Schwoch, T., Nicol, T., Warrier, C. M., Abrams, D. A., Kraus, N.
  2017; 27 (11): 5095-5115
- **Population responses in primary auditory cortex simultaneously represent the temporal envelope and periodicity features in natural speech** *HEARING RESEARCH*
  Abrams, D. A., Nicol, T., White-Schwoch, T., Zecker, S., Kraus, N.
  2017; 348: 31-43
- **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
- **Neurobiological Underpinnings of Math and Reading Learning Disabilities** *JOURNAL OF LEARNING DISABILITIES*
  Ashkenazi, S., Black, J. M., Abrams, D. A., Hoeft, F., Menon, V.
  2013; 46 (6): 549-569
- **Reply to Brock: Renewed focus on the voice and social reward in children with autism.** *Proceedings of the National Academy of Sciences of the United States of America*
  Abrams, D. A., Uddin, L. Q., Menon, V.
  2013; 110 (42): E3974-?
- **Multivariate Activation and Connectivity Patterns Discriminate Speech Intelligibility in Wernicke's, Broca's, and Geschwind's Areas** *CEREBRAL CORTEX*
  Abrams, D. A., Ryali, S., Chen, T., Balaban, E., Levitin, D. J., Menon, V.

2013; 23 (7): 1703-1714

- **Inter-subject synchronization of brain responses during natural music listening.** *European journal of neuroscience*
  Abrams, D. A., Ryali, S., Chen, T., Chordia, P., Khouzam, A., Levitin, D. J., Menon, V.
  2013; 37 (9): 1458-1469
- **Inferior colliculus contributions to phase encoding of stop consonants in an animal model** *HEARING RESEARCH*
  Warrier, C. M., Abrams, D. A., Nicol, T. G., Kraus, N.
  2011; 282 (1-2): 108-118
- **Decoding Temporal Structure in Music and Speech Relies on Shared Brain Resources but Elicits Different Fine-Scale Spatial Patterns** *CEREBRAL CORTEX*
  Abrams, D. A., Bhatara, A., Ryali, S., Balaban, E., Levitin, D. J., Menon, V.
  2011; 21 (7): 1507-1518
- **A possible role for a paralemniscal auditory pathway in the coding of slow temporal information** *HEARING RESEARCH*
  Abrams, D. A., Nicol, T., Zecker, S., Kraus, N.
  2011; 272 (1-2): 125-134
- **Sparse logistic regression for whole-brain classification of fMRI data** *NEUROIMAGE*
  Ryali, S., Supekar, K., Abrams, D. A., Menon, V.
  2010; 51 (2): 752-764
- **Rapid acoustic processing in the auditory brainstem is not related to cortical asymmetry for the syllable rate of speech** *Clinical Neurophysiology*
  Abrams DA, Nicol T, Zecker S, Kraus N
  2010; 121: 1343-1350
- **Abnormal Cortical Processing of the Syllable Rate of Speech in Poor Readers** *JOURNAL OF NEUROSCIENCE*
  Abrams, D. A., Nicol, T., Zecker, S., Kraus, N.
  2009; 29 (24): 7686-7693
- **Relating Structure to Function: Heschl's Gyrus and Acoustic Processing** *JOURNAL OF NEUROSCIENCE*
  Warrier, C., Wong, P., Penhune, V., Zatorre, R., Parrish, T., Abrams, D., Kraus, N.
  2009; 29 (1): 61-69
- **Right-hemisphere auditory cortex is dominant for coding syllable patterns in speech** *JOURNAL OF NEUROSCIENCE*
  Abrams, D. A., Nicol, T., Zecker, S., Kraus, N.
  2008; 28 (15): 3958-3965
- **Sensory-based learning disability: Insights from brainstem processing of speech sounds** *INTERNATIONAL JOURNAL OF AUDIOLOGY*
  Banai, K., Abrams, D., Kraus, N.
  2007; 46 (9): 524-532
- **Auditory brainstem timing predicts cerebral asymmetry for speech** *JOURNAL OF NEUROSCIENCE*
  Abrams, D. A., Nicol, T., Zecker, S. G., Kraus, N.
  2006; 26 (43): 11131-11137