

# Elizabeth Kaplan, BS BA

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## EDUCATION

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### University of California – San Diego

San Diego, CA | Sept 2024 – Present

*Cognitive Science PhD student – Advisor: Dr. Bradley Voytek*

- Anticipated Graduation: 07/01/2030

### Brown University

Providence, RI | Sept 2018 – May 2022

*Sc.B. Cognitive Neuroscience (3.8) with honors; A.B. Contemplative Studies (4.0) with honors*

- **Awards:** Questbridge Scholar; Undergraduate Teaching and Research (UTRA) Award; Summer Projects for Research, Internships, and Teaching (SPRINT) Award; Francisco Valera Prize for Outstanding Undergraduate Thesis; CLPS Premium for Excellence in the Cognitive Neuroscience Concentration.

### Neuromatch Academy

Virtual | July 2023

*Certificate in Computational Neuroscience*

- Collaborated on a project that trained a support vector machine classifier to decode affective versus neutral task conditions, derived from facial-expression stimuli, using correlations across regional and network-level brain activations.

## RESEARCH EXPERIENCE

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### Voytek Lab, PhD Student

UC San Diego | San Diego, CA | Sept 2024 – Present

- Currently investigating signal dynamics in recorded electrophysiological data using tools developed in the Voytek Lab. My primary investigation seeks to understand the relationship between aperiodic activity and k-complex and sleep spindle detection. Specifically, I am interested in testing whether cortical regions with higher spectral exponents exhibit greater occurrences of neural markers compared to neocortical association areas, and in exploring the relationship between 1/f noise properties and k-complex dynamics across different cortical states. In parallel with this project, I am currently conducting research in collaboration with the Greene Lab, examining the excitatory-inhibitory balance and markers of cortical dysregulation in children with Tourette syndrome. We are also evaluating the efficacy of therapeutic interventions designed to improve neural and behavioral outcomes.

### Jones Lab, Full-time Research Assistant / Lab Manager

Providence, RI | June 2022 – Sept 2024

- At the Carney Institute for Brain Science, I assisted with collecting and analyzing neurophysiological data, primarily M/EEG. I also worked with graduate students to implement a biophysically realistic neural modeling tool developed within the lab, The Human Neocortical Neurosolver (HNN), to model the effects of transcranial magnetic stimulation on the primary somatosensory cortex and elucidate the mechanisms that promote conscious awareness of tactile stimulation. I also worked independently on a project that sought to understand canonical mechanisms promoting our brain's neurophysiological responses across different sensory modalities. I worked primarily with modeling V1 data in HNN and simulating alpha to understand how top-down contributes to perception further. Furthermore, as the Lab Manager, I handled the logistical aspects of the lab, such as scheduling and finances.

### Quiroz Lab, Part-time Research Assistant

Boston, MA | Jan 2022 – Sept 2024

- At the Multi-Cultural Alzheimer's Prevention Program (MAPP), I used various FreeSurfer toolboxes to process and analyze MRI images collected as part of our Boston Latino Aging Study (BLAST) and the Colombia-Boston (COLBOS) study, a collaborative project with the Universidad de Antioquia. I also worked closely with members of the Harvard Aging Brain Study to develop pre-processing pipelines for this data. My independent project in the lab investigated the relationship between neural measures of integrity and cognitive performance in a group of oldest-old individuals from the Antioquia region of Colombia. Results suggested that total white matter volume may support cognitive resilience in this group.

**Lazar Lab**, Undergraduate Research Assistant  
Boston, MA | Sep 2020 – May 2022

- Through a SPRINT-funded opportunity, I explored the short and long-term impacts of meditation training on declarative memory performance and white matter integrity in major white matter tracts associated with the hippocampus. This project revealed that hippocampal white matter tracts are modifiable through mindfulness training and are related to improvements in memory.

**Oh Lab**, Undergraduate Research Assistant  
Providence, RI | January 2020 – May 2022

- Through a UTRA-funded opportunity, I investigated the association between white matter integrity in individuals on the Alzheimer's Disease spectrum and disorders such as depression/anxiety by analyzing diffusion tensor imaging (DTI), cognitive and psychiatric measures, and biospecimen data. These analyses revealed no significant relationship between white matter integrity and affective disorder symptomology.

## TEACHING EXPERIENCE

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**COGS108 – Data Science in Practice**, TA

Cognitive Science Department, UC San Diego | Jan 2025 – March 2025 & Oct 2025 – Dec 2025

**COGS180 – Brain-Computer Interfaces**, TA

Cognitive Science Department, UC San Diego | June 2025 – Aug 2025

**COGS010 – Introduction to Python**, TA

Cognitive Science Department, UC San Diego | Apr 2025 – June 2025

**NEUR 1440 - The Meanings and Mechanisms of Neural Dynamics**, TA

Neuroscience Department, Brown University | Sept 2022 – Dec 2022

**COST1020: The Cognitive Neuroscience of Meditation**, Undergraduate TA

Contemplative Studies Department, Brown University | May 2021 - Aug 2021

**CLPS0900: Statistical Methods**, Undergraduate TA

Cognitive, Linguistic, and Psychological Sciences (CLPS) Department, Brown University | Sep 2021 – Dec 2021

## PRESENTATIONS

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### Posters:

- **Kaplan, E.**, Correia, S., Oh, H. *Associations between neuropsychiatric symptoms, white matter microstructural integrity, and diagnostic status in the spectrum of Alzheimer's disease*. Alzheimer's Association International Conference, July 2020, Virtual.
- Sliva, D.D., Kohl, C., Daniels, D.S., Chen, N., Thompson, R.M., **Kaplan, E.** & Jones, S.R. *Low-intensity Single Pulse Transcranial Magnetic Stimulation (TMS) Increases Detection Accuracy of Perceptual-Threshold Level Tactile Stimuli*. Poster Presented at the Society for Neuroscience Annual Conference, Nov. 2022, San Diego, California.
- Langella, S., **Kaplan, E.**, Baena, A., Londono, N., Munera, D., Vila-Castelar, C., Alvarez, V., Vidal, F., Properzi, M., Sanchez, J., Sperling, R., Johnson, K., Lopera, F., Hanseeuw, B., Quiroz, Y. *Regional tau predicts glucose hypometabolism in autosomal dominant Alzheimer's disease: Findings from the Colombia-Boston (COLBOS) biomarker study*. 15<sup>th</sup> annual Human Amyloid Imaging Conference, Jan. 2023, Miami, Florida.
- Sliva, D.D., Kohl, C., Daniels, D.S., Chen, N., Thompson, R.M., **Kaplan, E.** & Jones, S.R. *Examining the role of attention-mediated changes in transient beta events on TMS-evoked responses using TMS-EEG and computational neural modeling*, 5th International Brain Stimulation Conference, Feb. 2023, Lisbon, Portugal.

- Langella S, **Kaplan E**, Baena A, Londono N, Munera D, Vila-Castelar C, Alvarez S, Vidal M, Properzi M, Sanchez JS, Sperling RA, Johnson K, Lopera, Hanseeuw BJ, Quiroz YT. Glucose hypometabolism is associated with brain pathology and cognitive-behavioral symptoms in autosomal dominant Alzheimer's disease: Findings from the Colombia-Boston (COLBOS) Biomarker Study. 2023 Alzheimer's Association International Conference AAIC, Amsterdam, Netherlands.
- Vila-Castelar C, Baena AY, Langella S, Munera D, Aguillon D, Alvarez S, Sanchez J, **Kaplan E**, Aduen P, Guzman-Velez E, Pluim McDowell C, Martinez JE, Noriega D, Badillo A, Bonillas N, Fabrega-Ching S, Ramirez Gomez L, Giudicessi A, Lee H, Johnson K, Sperling RA, Lopera F, Quiroz YT. Longitudinal effects of sex on pathology accumulation, neurodegeneration, and cognitive decline in Presenilin-1 E280A mutation carriers: preliminary findings from the Colombia-Boston (COLBOS) biomarker study. 2023 Alzheimer's Association International Conference AAIC, Amsterdam, Netherlands.
- Giudicessi, A\*, Gatchel J, Vila-Castelar C, Ramirez-Gomez LA, Auden P, Noriega D, Bonillas N, **Kaplan E**, Martinez J, Fabrega S, Castillo C, Badillo A, Properzi MJ, Kirn D, Amariglio R, Rentz D, Johnson KA, Sperling RA, Quiroz YT. Associations among depressive symptoms, hippocampal volume, and cognition in community-dwelling older Latinos. 2023 Alzheimer's Association International Conference AAIC, Amsterdam, Netherlands.
- Zimmerman C; **Kaplan E**; Chen N; Carayannopoulos A; Jones S; Petzschner F. Electrophysiologic markers of altered interoceptive processing in Chronic Back Pain Patients undergoing Radiofrequency Ablation. 22nd Annual Pain Medicine Meeting. American Society of Regional Anesthesia. November 10-11, 2023. New Orleans, LA.
- **Kaplan E.**, Herrera C., Sevnich G., Wong B., Kaufman R., Datta T., Dickerson B., Lazar S.W. *The Impact of Mindfulness Training on Major White Matter Tracts Associated with the Hippocampus*. Presented at the Mindfulness Mechanisms and Meanings Meeting (M4). October 5-6, 2023. St. Louis, MO.
  - Selected for a Travel Award to support attendance\*
- **Kaplan E.**, Langella S., Baena A., Munera D., Martinez J., Giudicessi A., Badillo Cabrera A., Bonillas Felix N., Slavich G., Alvarez G., Lopera F., Quiroz Y.T. *Associations among early-life adversity, hippocampal volume, and cognitive performance in non-demented individuals with autosomal dominant Alzheimer's Disease*. Poster Abstract to be presented at The International Neuropsychological Society 54<sup>th</sup> Annual North American Meeting 2024. February 14-17, 2023. New York City, New York.
- Okada de Oliveira M., Schwab N., Munera D., Giudicessi A., Bonillas Felix N., **Kaplan E.**, Martinez J., Badillo Cabrera A., Vila-Castelar C., Ramirez-Gomez L., Gonzalez Catalan M., Quiroz Y.T. *Association between acculturation and discrimination with cognitive performance from the Boston Latino Aging Study*. Submitted Poster Abstract. International Neuropsychological Society. February 14-17, 2023. New York City, New York.
- Giudicessi A., Munera D., Badillo Cabrera A., Munera D., **Kaplan E.**, Ramirez-Gomez L., Gonzalez Catalan M., Vila-Castelar C., Goldstein J., Cronin-Golomb A., Quiroz Y.T., *Association between Reproductive History and Cognition in Post-Menopausal Latinas from the Boston Latino Aging Study*. Submitted Poster Abstract. International Neuropsychological Society. February 14-17, 2023. New York City, New York.
- Martinez J., Vila Quispe M., Pite A., Munera D., Badillo Cabrera A., Bonilla Felix N., Giudicessi A., **Kaplan E.**, Vila-Castelar C., Ramirez-Gomez L., Gonzalez Catalan M., Cronin-Golomb A., Amariglio R., Quiroz Y.T. *Sex differences in subjective cognitive decline and global cognition in older adults from the Boston Latino Aging Study*. Poster Abstract to be presented at The International Neuropsychological Society 54<sup>th</sup> Annual North American Meeting 2024. February 14-17, 2023. New York City, New York.
- Alcina J., Gatchel J., Munera D., Giudicessi A., Bonillas Felix N., **Kaplan E.**, Martinez J., Badillo Cabrera A., Vila-Castelar C., Ramirez-Gomez L., Gonzalez Catalan M., Quiroz Y.T. *Associations among loneliness, subjective and objective cognitive decline in community-dwelling older Latinos*. Submitted Poster Abstract. International Neuropsychological Society. February 14-17, 2023. New York City, New York.

- Manojkumar, S., **Kaplan, E.**, Hornberger, M., Baena, A., Munera, D., Sanchez, J., Lopera, F., Quiroz, Y.T. *Thalamic Nuclei Atrophy in Autosomal Dominant Alzheimer's Disease*. Submitted Poster Abstract. International Society for Magnetic Resonance in Medicine. May 04-09, 2024. Singapore.
- **Kaplan, E.**, Zuluaga, Y., Vasquez, D., Hincapie, L., Aguillon, D.F., Madrigal, L., Baena, A.Y., Vila-Castelar, C., Alvarez, S., Ochoa-Escudero, M., Giraldo-Chica, M.M., Ramirez Gomez, L.A., Langella, S., Arboleda-Velasquez, J.F., Lopera, F., Quiroz, Y.T. *Association between Hippocampal Volume and Cognition in the Oldest-Old Individuals from Colombia*. Presented virtually at the Alzheimer's Association International Conference, 2024. Philadelphia, Pennsylvania.
- **Kaplan, E.**, Duecker, K., Tolley, N., Diesburg, D., Jones, S.R. *Modeling Cortical Dynamics in Visually Evoked Responses Using the Neocortical Neurosolver (HNN)*. Presented at the Society for Neuroscience Annual Conference, 2025. San Diego, California.
- Smith, E., **Kaplan, E.**, Voytek, B. *Neural Signatures of Sleep Deprivation in Aperiodic Activity*. Presented at the Society for Neuroscience Annual Conference, 2025. San Diego, California.
- **Kaplan, E.**, Chang, S., Park, S., Pooni, M., Mungai, T., Baim, A., Ahern, J., Ali, S.A., Ahn, J.H.B., Hodapp, S., Reiner, G., Friedman, J., Cazares, C., Schallmo, M-P., Voytek, B., Conelea, C., Wang, S., Greene, D.J. *Aperiodic Neural Activity as a Marker of Excitation/Inhibition Balance in Children with Tourette Syndrome*. To be presented at the Cognitive Neuroscience Society Annual Conference, 2026. Vancouver, B.C. Canada.

#### Talks:

- *Impact of Mindfulness Training on Declarative Memory Performance and Microstructural Integrity in Major White Matter Tracts Associated with the Hippocampus*. Presented at the International Society for Contemplative Research Inaugural Conference, 2023, San Diego, California.
  - Selected for Travel Award to support attendance\*

## PUBLICATIONS

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- **Kaplan E**, Correia S, Oh H. Associations between neuropsychiatric symptoms, white matter microstructural integrity, and diagnostic status in the spectrum of Alzheimer's disease. *Alzheimer's & Dementia* 2021;17:e054731. <https://doi.org/10.1002/alz.054731>.
  - Sliva DD, Kohl C, Daniels DS, Chen N, Thompson RM, **Kaplan E**, Jones SR. Examining the role of attention-mediated changes in transient beta events on TMS-evoked responses using TMS-EEG and computational neural modeling. *Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation* 2023;16:323–4. <https://doi.org/10.1016/j.brs.2023.01.602>
  - Quiroz Y.T., Aguillon D., Zuluaga Y., Baena A., Vásquez D., Madrigal L., Hincapie L., Sanchez J., Langella S., Ramirez L., **Kaplan E.**, Garcia G., Krasemann S., Glatzel M., Kosik K., Johnson K., Sperling R., Reiman E., Sepulveda D., Lopera F., Arboleda-Velásquez J.F., APOE3 Christchurch heterozygosity delays clinical onset in autosomal dominant Alzheimer's disease. *The New England journal of medicine*, 390(23), 2156–2164. <https://doi.org/10.1056/NEJMoa2308583>

## AD HOC REVIEWING

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- *Aperiodic 1/f noise drives ripple activity in humans*. [author information removed for double-anonymized peer review]. Nature Communications.

## MENTORSHIP EXPERIENCE

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**Questbridge Alumni Mentorship Program**, Alumni Mentor (2<sup>nd</sup> year in role) to current undergraduate Questbridge scholars; **Graduate Women in Computing at UCSD (GradWIC)**, Mentor to two undergraduate students in fields related to computation; **Voytek Lab**, Mentor to one undergraduate student new to research; **TA Mentor**, mentor to first-year graduate students in their first quarter of teaching course, Data Science in Practice (COGS108).

## SKILLS

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- EEG Analysis: ERP & time-frequency analysis, data acquisition & experimental setup, preprocessing & quality control, custom preprocessing pipeline development (MNE-Python, EEGLAB)
- Neuroimaging: Structural and diffusion MRI processing (FreeSurfer, FSL)
- Programming & Data Science: Scientific computing and statistical analysis (Python, MATLAB)