CANLAB

Clinical Affective Neuroscience Laboratory

2019 Newsletter

Our Purpose:

The overarching goal of the Clinical Affective Neuroscience Laboratory at the University of Georgia is to conduct research on the mechanisms underlying negative symptoms of schizophrenia and factors that predict conversion to psychosis in at-risk youth. We aim to use the knowledge gained from these studies to develop novel interventions and risk prediction methods for the early identification of psychotic disorders. We are grateful for the participants who completed our studies and healthcare providers who made recruitment possible. Your contributions have allowed us to make contributions to the understanding, treatment, and early intervention of psychosis.

UNIVERSITY OF GEORGIA

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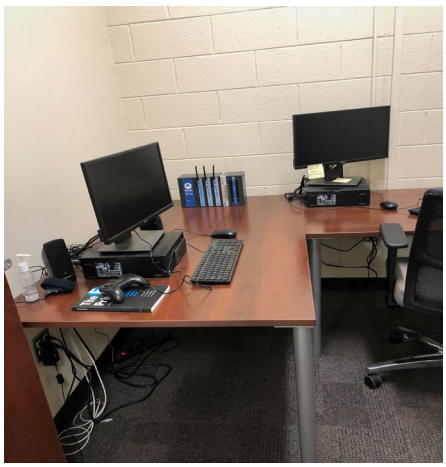
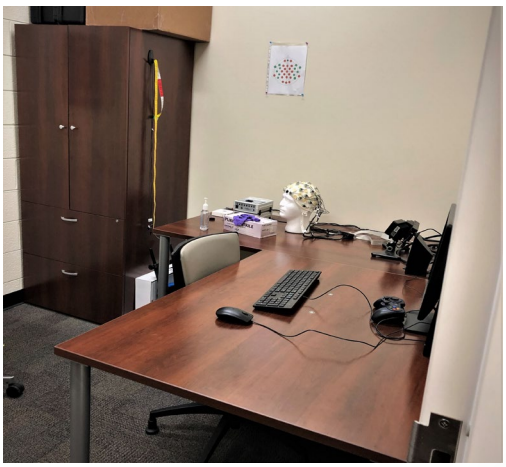
2017

2019





From then to Now:

Dr. Strauss moved to UGA in January, 2017 and the CAN lab opened its doors for research in July 2017 after 6 months of lab construction. We thought it would be fun to show the progression of our lab space from our arrival in 2017 when the lab was but a skeleton of metal beams and dreams, to our current thriving and successful operation in 2019. The lab has undergone tremendous growth over the past 3 years!

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Departures and Arrivals:

In 2019, Mr. Ian Raugh completed his two year tenure as our lab manager. Luckily for us, he decided to keep his talents in Athens for 5 more years as our grad student. Ms. Cristina Gonzalez, who was an undergraduate and then research coordinator for the past 2 years, has taken over the role of lab manager. We also hired 3 additional staff members. Ms. Sydney Howie joined us from UNC Chapel Hill, where she completed her BS in Psychology and worked in the psychosis lab of Dr. David Penn. Sydney now coordinates the 3 site GAINS R01l. We also welcomed two new employees contributing to the quantitative aspects of our lab, Mr. Yupeng Xie and Ms. Sayli Narkhede , and 5 new undergraduate RAs: Will Macfie, Kailey Clark, Mirna Huskovic,Tyler Dobson, and Liana Giglio.

We had departures from several lab members who have moved on to pursue very bright futures. Two of our inaugural CAN Lab undergraduate RAs graduated with their Bachelor's degrees, Ms. Aminah Matthews and Mr. Nathan Cherukuri, who have moved on to Graduate/Medical school. Research coordinator, Ms. Hannah Chapman, moved on to a position in clinical service provision, as she discovered her passion and long-term goal of being a clinician. Dr. Strauss' first start to finish PhD student, Mrs. Katie Visser, completed the in house requirements for her PhD and has moved to the VA Connecticut Healthcare System in New Haven, where she is completing her clinical internship.

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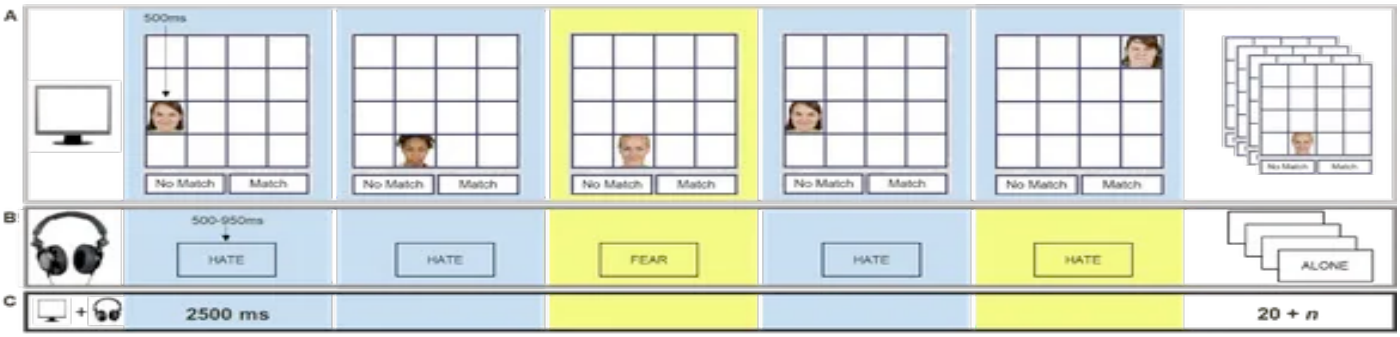
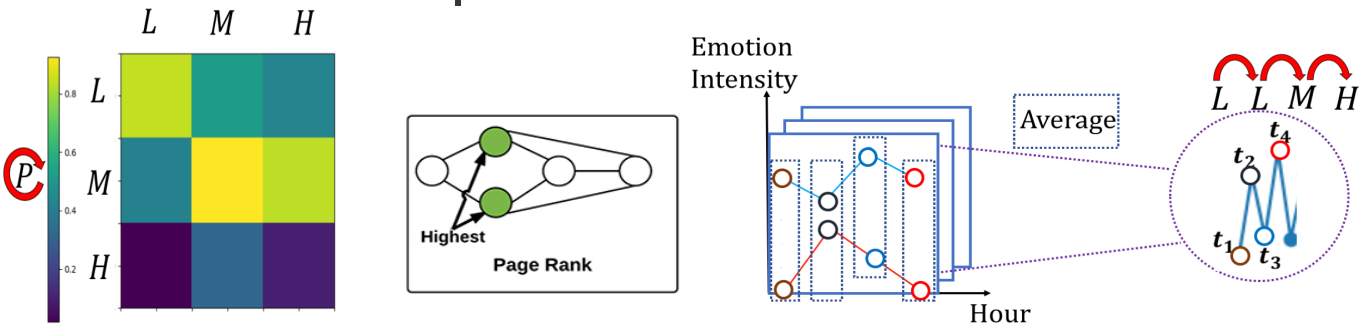


Research Spotlight:
2019 was another productive year for the CAN Lab, as we published 24 papers and acquired/continued 7 external grants totaling about $9.5 million.

Grants:
1. R01-MH120092 (PI: GP Strauss) 04/01/2020-03/31/2025
NIMH $2,080,177
4/5 CAPER: Computerized Assessment of Psychosis Risk
This grant develops and validates a novel computerized screening battery for the early identification of psychosis among youth with prodromal syndromes. This study pools data across 6 collaborative sites, including: Northwestern (Mittal), Maryland (Gold, Schiffman, Waltz), Temple (Ellman), Emory (Walker), and Yale (Corlett, Woods, Powers).

2. R21 –MH122863 (PI: GP Strauss) 04/01/2020-03/31/2022
NIMH $440,650
Computationally modeling the failure of effort to become a secondary reinforcer in schizophrenia
This grant uses computational modeling and pupillometry to test the novel hypothesis that avolition in schizophrenia results from a failure of effort to acquire the capacity to become a secondary reinforcer. Amitai Shenhav at Brown University is Co-Pi.

3. R61-MH121560 (PI GP Strauss) 04/01/2020 – 03/31/2025
NIMH $2,997,345
Cognitive training for emotion regulation in psychotic disorders.
This grant examines the efficacy of a novel app-based cognitive training program for enhancing the proximal target of emotion regulation via a direct mechanistic effect on increasing prefrontal activation, as well as a distal target of improving symptoms and functional outcome. fMRI is used as the primary measure to determine engagement of the hypothesized mechanism of action. Co-investigators include UGA professors Drs. Larry Sweet and Dean Sabatinelli, and UNSW professor Dr. Susanne Schweizer.



4. R21-MH119438 (PI GP Strauss) 09/01/2019-08/31/2021
NIMH $415,250
Mechanisms Underlying Emotion Regulation Abnormalities in Youth at Clinical High-Risk for Psychosis
This grant examines mechanisms underlying emotion regulation abnormalities at the identification, selection, and implementation stages in youth at clinical high-risk for psychosis using EMA, ambulatory psychophysiology, EEG, pupillometry, and eye-tracking. UGA professor, Dr. Dean Sabatinelli is a co-investigator.

5. R01-MH116039 (PI GP Strauss) 03/01/2019-11/30/2023
NIMH $2,969,883
Prodromal Inventory for Negative Symptoms (PINS): A Development and Validation Study
This grant develops and validates novel methods for assessing negative symptoms in youth at clinical high-risk for psychosis to enhance risk prediction algorithms. These include a clinical rating scale, digital phenotyping, and social media methods. Data is pooled across 3 collaborative sites, UGA (Strauss), Emory (Walker), and Northwestern (Mittal).

6. NARSAD Young Investigator Grant (PI GP Strauss) 01/15/2019-01/15/2021
Brain & Behavior Research Foundation $70,000
Neurocomputational models of psychosis risk
This grant uses computational modeling approaches to examine reward processing mechanisms underlying positive and negative symptoms involved with conversion to a psychotic disorder in youth at clinical high-risk for psychosis. Anne Collins at UC Berkeley is collaborating on computational models.

7. R21- MH112925 (PI GP Strauss) 04/01/2017- 03/31/2020
NIMH $417,456
Modeling anhedonia in schizophrenia: A stochastic dynamical systems approach
This grant applies mathematical models to ecological momentary assessment data to test novel theories about anhedonia reflecting abnormalities in the temporal dynamics of emotion in schizophrenia. Models include Markov chain and network analyses of EMA data. Dr. Hiroki Sayama at Binghamton University is a co-investigator, facilitating computational modeling.

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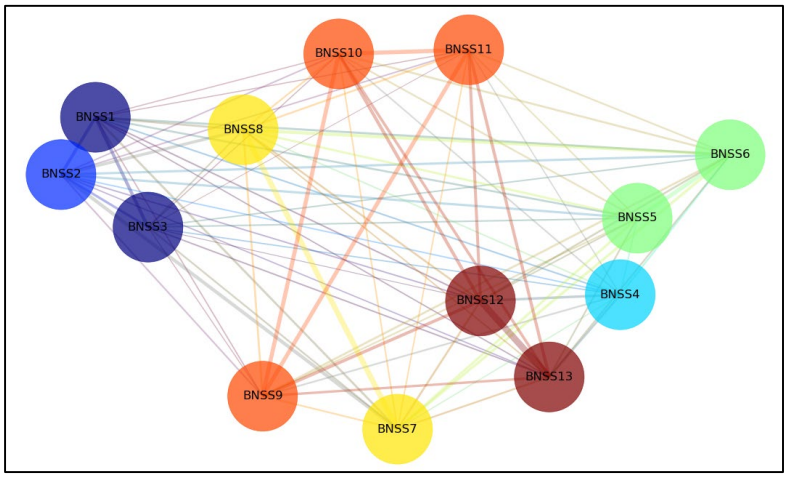

Summary of Key Findings and Future Directions for 2020:
Our research has 4 primary areas of focus, the phenomenology, etiology, assessment, and treatment of negative symptoms. Historically, this work has focused on adults with schizophrenia. Over the past 3 years, we have also extended this research to the psychosis prodrome. This past year, our prodromal research kicked into high gear with multiple active prodromal grants and longitudinal follow-up studies.

Phenomenology:
In 2018, we demonstrated that a recent trend toward conceptualizing negative symptoms as a single dimension or two broad dimensions did not capture the complexity of the construct. Rather, negative symptoms adhere to either a hierarchical structure or reflect 5 distinct domains. We demonstrated this across the 3 most contemporary rating scales: BNSS, CAINS, SANS. This year, we extended our findings to demonstrate that the 5 factor model also applies across cultures and can be found using alternative mathematical approaches (eg network analysis). In 2020, we will publish a series of studies demonstrating that the 5 domains have unique external correlates (eg, neural, cognitive, psychological) that are masked by the broader 2 dimensional conceptualization. Such evidence will suggest that the 5 domains represent distinct treatment targets with separable mechanisms of action, and that a revision to DSM5 diagnostic criteria for schizophrenia may be warranted.

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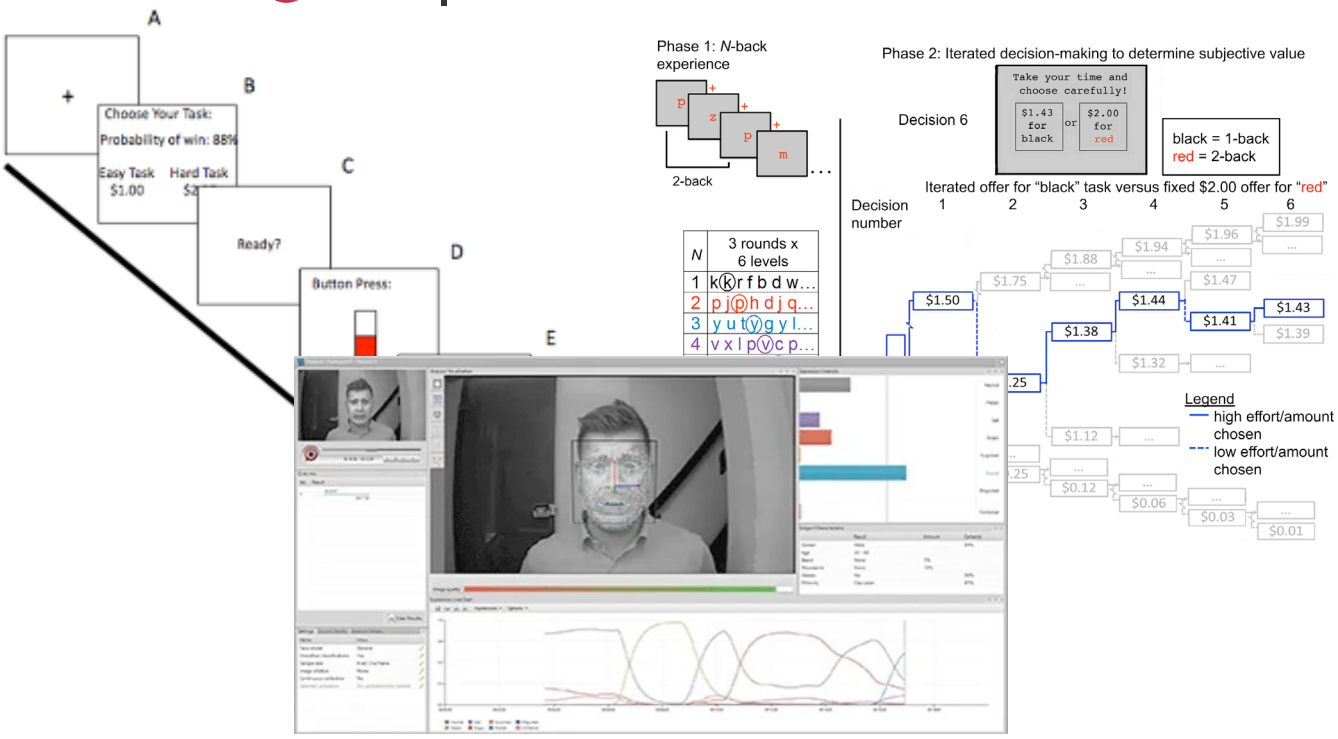

Etiology:

In collaboration with colleagues in Hong Kong and Beijing, we published a series of studies on effort cost computation as a mechanism of avolition. These studies extend our prior work in the chronic phase of schizophrenia by demonstrating that similar abnormalities occur in the first episode and transdiagnostically in bipolar disorder and depression. Grad student Katie Visser published a meta-analytic study on anticipatory pleasure deficits, demonstrating that these occur across the schizophrenia spectrum. Our collaborative studies with Northwestern University and studies from our lab demonstrated that cortical frontal alpha asymmetry, blunted facial affect, and trait emotional experience abnormalities can be detected in those at clinical high-risk for psychosis and that these abnormalities and are predictive of negative symptom severity, much like in schizophrenia. In a series of studies, we also isolated the nature of emotion regulation abnormalities in those with schizophrenia, those at clinical high-risk, or those with psychotic like experiences recruited from the community. In 2020, we are continuing to use a multimodal approach (computational modeling, fMRI, EEG, eye tracking, and pupillometry) to explore similar questions about negative symptom mechanisms in adults with schizophrenia and youth at clinical high risk for psychosis.

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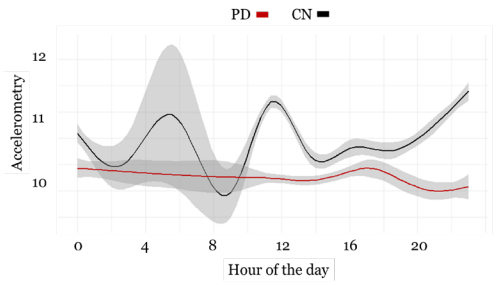

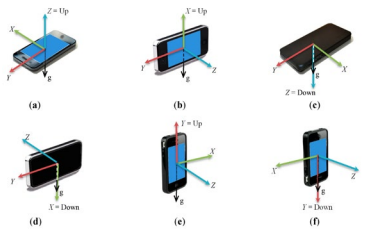

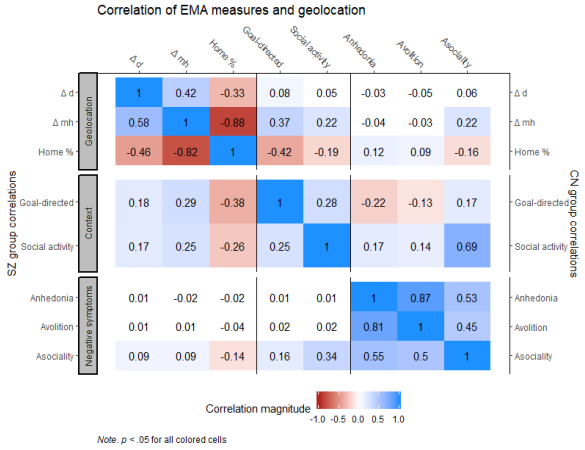

Assessment:

In 2019, our primary focus has been on developing and validating next-generation negative symptom measures. This includes: 1) a second generation rating scale for youth at clinical high-risk for psychosis, NSI-PR, in response to the NIMH consensus conference, as part of an NIMH R01; 2) 3rd generation negative symptom assessments using active (ema surveys, videos submitted to automated facial and vocal affect, lexical analysis, and semantic analysis) and passive (geolocation, accelerometry, ambient sound) digital phenotyping; 3) social media data. We are developing and validating these measures in adults with schizophrenia and youth with prodromal syndromes. A key goal of this work is to develop novel negative symptom based methods for risk identification and monitoring. In 2019, we published several review and overview papers setting the theoretical stage for follow-up empirical papers on digital phenotyping. In 2020, we will follow-up these papers and publish a series of psychometric validation studies on digital phenotyping.

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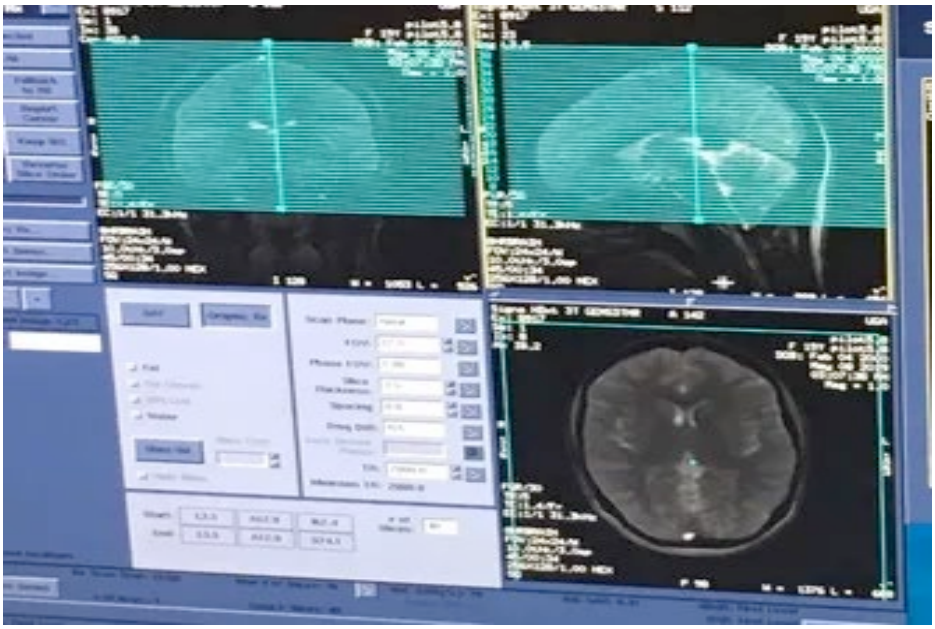

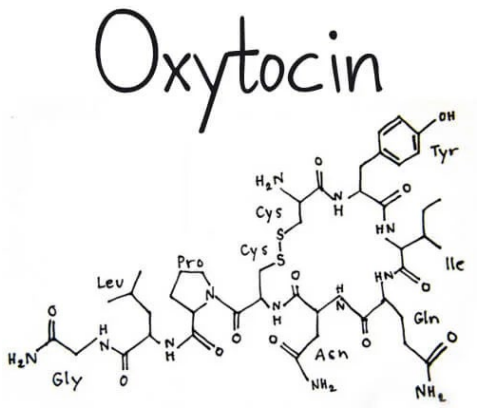

Treatment:

In a series of prior studies, our research tied endogenous oxytocin disruption to negative symptoms and impaired social cognition in schizophrenia. Such evidence led Dr.Strauss and colleagues at Maryland to test the efficacy of oxytocin for enhancing negative symptoms and social cognition in schizophrenia. To date, our studies have consistently demonstrated that oxytocin has no benefit over placebo for negative symptoms or social cognition. This year we demonstrated that combining oxytocin with a psychosocial therapy (cbsst) has no benefit beyond cbsst alone for social cognition. In 2020, we will demonstrate similar null findings on combining oxytocin with cbsst for negative symptoms, as well as additional null evidence for multiple dosing oxytocin on social cognition. In 2020, our primary treatment related endeavors will focus on starting a newly funded NIMH R61/33 grant testing the efficacy of a cognitive training mobile app for enhancing emotion regulation.

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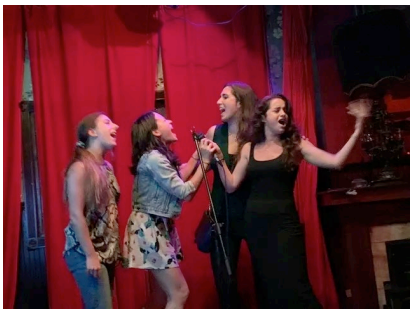

Lab Member Spotlight on Accomplishments:

CAN Lab's talented students, staff, and alumni had a number of exciting achievements this past year! Grad student Katie Visser successfully proposed her dissertation, collected her dissertation data, and matched for clinical internship at the VA Connecticut Healthcare System. She published a first author meta-analysis on anticipatory pleasure resulting from her comps paper. Her rock star status will continue on post doc, which she is currently interviewing for. Grad student Ivan Ruiz passed comps and submitted his comps paper on effort and neuropsychological impairment in schizophrenia for publication, which received a revise and resubmit at Neuropsychology Review. He is also collecting data for a very novel dissertation examining mechanisms of cognitive effort in schizophrenia using pupillometry and submitted a grant to obtain an NIH diversity fellowship related to this topic. Grad student Lisa Bartolomeo published a series of new papers on her work involving motor function in schizophrenia from her prior lab at Indiana, as well as her first 1st author paper on frontal alpha asymmetry and negative symptoms in youth at clinical high-risk for psychosis. Lisa has also been 1st author or coauthor on 6 other papers examining emotion regulation and mechanisms of negative symptoms using data from our lab that were submitted this year, and completed NIH's prestigious ERP bootcamp. At SRP in Buffalo, Lisa lead a round of CAN Lab Karaoke that went viral on twitter (at least viral for academic psychology!). First year grad student Ian Raugh was awarded UGA's prestigious GREAT fellowship. Ian also published his 1st first author paper, a review of ambulatory psychophysiological methods in psychiatry. He has also been first or co-author on several additional papers under review that focus on digital phenotyping, emotion regulation, and mindfulness in schizophrenia. Ian also continues to carry the weight in the lab when it comes to being "punny". Undergraduate Kendall Clay won a CURO travel award. Dr. Strauss was program chair of the Society for Research in Psychopathology, named co-chair of an NIMH initiative and conference on novel treatment mechanisms., and received UGA teaching and mentorship awards.

CAN Lab alumni, Drs. Kayla Whearty, Sara Sullivan, and Lindsay Morra all completed their postdoctoral fellowships in neuropsychology and were promoted to faculty positions in Medical Schools/VA Hospitals. Former lab managers Lauren Catalano and Adam Culbreth completed their PhDs and are currently postdoctoral fellows at UCLA and UMD, respectively.

Most importantly, the world was blessed by the arrival of CAN Lab's newest junior scientist, Leonardo Ruiz, son of CAN lab graduate student Mr. Ivan Ruiz and his wife Ollie.