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Clinical Affective Neuroscience Laboratory

OUR PURPOSE:

The research in our lab primarily focuses on “negative symptoms” in people diagnosed with schizophrenia and youth at clinical high-risk for psychosis. Negative symptoms are reductions in motivation, social activity, emotion, expression, speech, goal-directed behavior, and recreational activities. We’re attempting to better characterize negative symptoms, developing new tools to assess them, identifying their psychological and neural mechanisms, and evaluating the efficacy of novel treatments.

NEWSLETTER 2024

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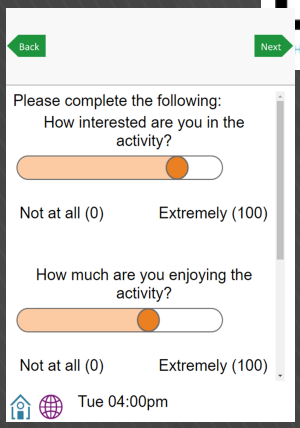
NEGATIVE SYMPTOM ASSESSMENT & PHENOMENOLOGY

Our studies consistently indicate that negative symptoms are best represented by a hierarchical structure consisting of 2 broad dimensions (Motivation and Pleasure; Emotional Expressivity) and 5 lower-level domains (anhedonia, avolition, asociality, blunted affect, alogia). We find this pattern in schizophrenia across scales, sexes, cultures, and statistical approaches.

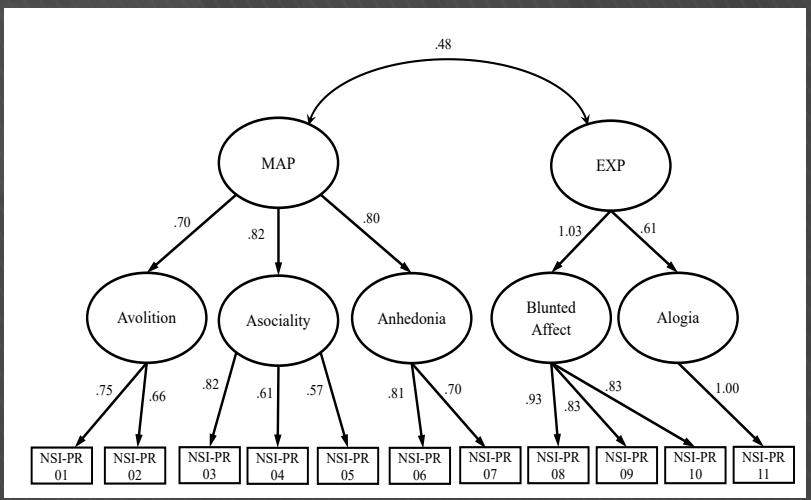
We extended this finding on latent structure to youth at clinical high-risk for psychosis using the Negative Symptom Inventory-Psychosis Risk (NSI-PR) in the Georgia and Illinois Negative Symptom Study (GAINS), a multi-site collaborative R01 project between UGA, Northwestern (Vijay Mittal), and Emory (Elaine Walker).

GAINS

THE GEORGIA AND ILLINOIS NEGATIVE SYMPTOM STUDY



The NSI-PR was validated using novel digital phenotyping and social media methods.



The NSI-PR is the negative symptom outcome measure used in the NIMH AmpScz ProNet and Prescient studies.

Strauss, G. P., Walker, E. F., Carter, N. T., Luther, L., & Mittal, V. A. (2024). The Negative Symptom Inventory-Psychosis Risk (NSI-PR): Psychometric Validation of the Final 11-Item Version. Schizophrenia Bulletin, sbae206.

Wannan, C.M.J. et al. (2024). AMP SCZ: Rationale and study design of the largest global prospective cohort study of clinical high-risk for psychosis. *Schizophrenia Bulletin*.

Addington et al. (2024). Sample Ascertainment and Clinical Outcome Measures in the AMP SCZ Study. *Schizophrenia*.

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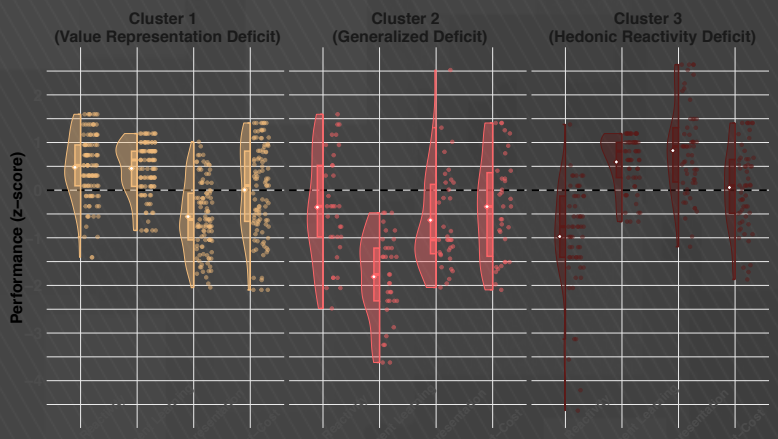
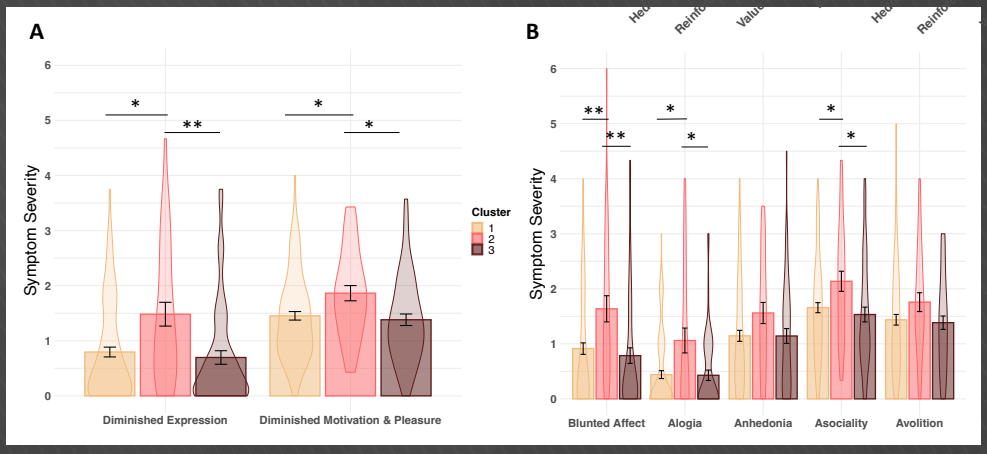
NEGATIVE SYMPTOM MECHANISMS

Equifinality is a key topic of interest in our lab, i.e., multiple mechanistic pathways to the same clinical endpoint of negative symptoms. In two studies, we found evidence for multiple profiles of reward processing impairments that lead to negative symptoms; however, global reward processing deficits predict the most severe cases transdiagnostically and transphasically.

Luther et al . Found evidence for multiple reward processing profiles in a transdiagnostic sample with serious mental illness mood and psychotic diagnoses.

Spilka et al. replicated this finding in a sample of youth at clinical high-risk for psychosis and a mood/anxiety disorder comparison sample.





Luther*, L., Jarvis*, S.A., Spilka*, M.J., & Strauss, G.P. (2024). Global reward processing deficits predict negative symptoms transdiagnostically and transphasically in a severe mental illness-spectrum sample. *European Archives of Psychiatry and Clinical Neuroscience,* 274(7):1729-1740.

Spilka*, M. J., Millman, Z. B., Waltz, J. A., Walker, E. F., Levin*, J. A., Powers, A. R., Corlett, P. R., Schiffman, J., Gold, J. M., Silverstein, S. M., Ellman, L. M., Mittal, V. A., Woods, S. W., Zinbarg, R., & Strauss, G. P. (2025). A generalized reward processing deficit pathway to negative symptoms across diagnostic boundaries. *Psychological Medicine*.

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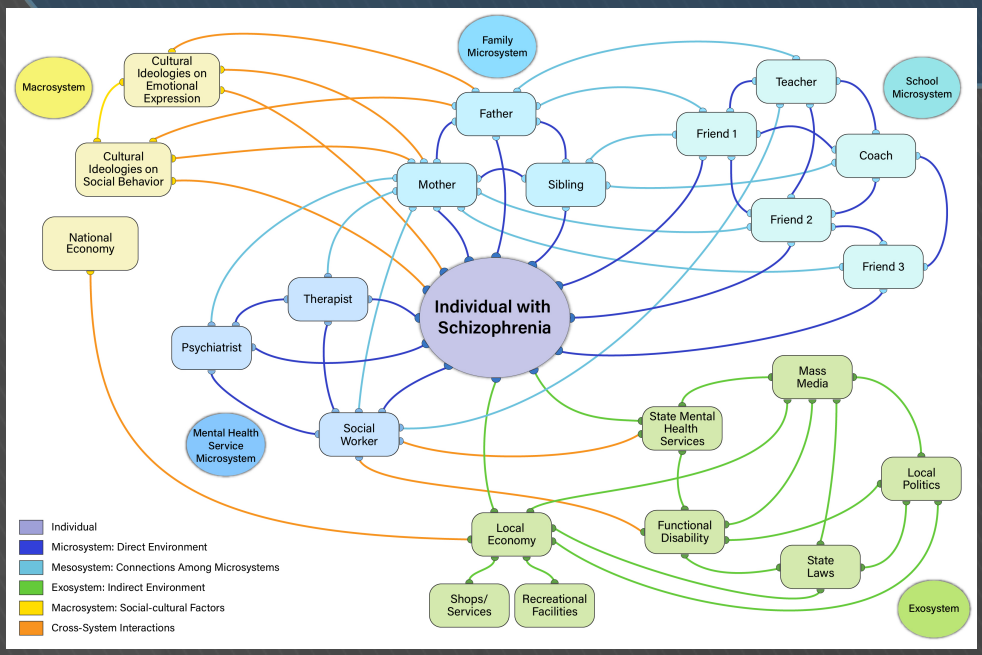
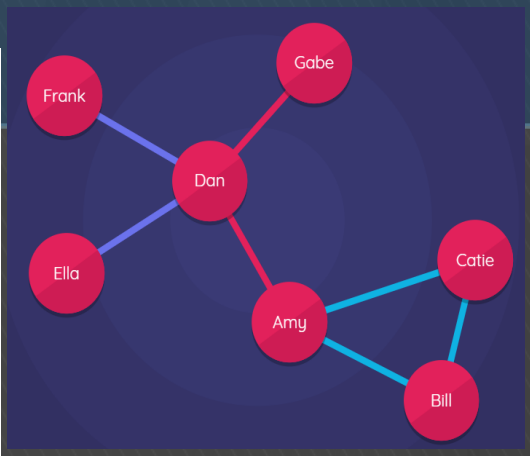
NEGATIVE SYMPTOM MECHANISMS

In 2021, we proposed the bioecosystem model of negative symptoms which posits a role for specific environmental factors that prevent access to resources needed to perform social, goal-directed, and recreational activities. We found support for this model in several ways in 2024.





We found that environmental deprivation factors in the microsystem (number of social and activity settings) and exosystem (economy, mass media, politics/laws, neighborhood crime) were associated with negative symptoms. The associations were not due to depression and were greater among those with schizophrenia than those at clinical high-risk for psychosis.

Using a digital version of the sociogram and social network analysis, Zhang et al. demonstrated that higher negative symptoms were associated with a reduced number and variety of microsystems for performing activities, as well as fewer connections within and across microsystems.

Strauss, G.P.(2024). Environmental factors contributing to negative symptoms in youth at clinical high-risk for psychosis and outpatients with schizophrenia. *Social Psychiatry and Psychiatric Epidemiology,* 59(7):1167-1175.

Zhang*, L., James*, S.H., Standridge, J., Condray, R., Allen, D.N., Strauss, G.P. (2025). Social network reductions are associated with negative symptoms in schizophrenia. *Social Psychiatry and Psychiatric Epidemiology.*

Strauss, G. P. (2021). A bioecosystem theory of negative symptoms in schizophrenia. *Frontiers in psychiatry, 12,* 655471.

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NEGATIVE SYMPTOM MECHANISMS

The cognitive model posits that negative symptoms are caused and maintained by certain dysfunctional beliefs that reduce motivation for productive activities, including defeatist performance beliefs, asocial beliefs, and low pleasure beliefs. This year, we extended this model in several ways.

We conducted an Ecological Momentary Assessment study that examined negative symptoms in daily life. Luther et al. found that defeatist performance beliefs fluctuate across time and contexts in those with schizophrenia. This suggests when, where, and how to intervene using digital therapeutics.

We also conducted the first large-scale multi-site psychometric study on the trait defeatist performance beliefs scale. Although it is common practice to examine 1 total score, Luther et al. showed that the scale has 3 factors. These factors represent distinct psychological treatment targets for negative symptoms.

Example of defeatist performance beliefs

Luther*, L., Raugh*, I.M., Grant, P.M., Beck, A.T., Strauss, G.P. (2024). The Role of Defeatist Performance Beliefs in State Fluctuations of Negative Symptoms in Schizophrenia Measured in Daily Life via Ecological Momentary Assessment. Schizophrenia Bulletin, 50(6), 1427-1435.

Luther*, L., Ahmed, A.O., Grant, P.M., Granholm, E., Gold, J.M., Williams, T.F., Pratt, D., Holden, J., Walker, E.F., Arnold*, L., Ellman, L.M., Mittal, V.A., Zinbarg, R., Silverstein, S.M., Corlett, P.R., Powers, A.R., Woods, S.W., Waltz, J.A., Schiffman, J., & Strauss, G.P. (2025). Revisiting the Defeatist Performance Belief Scale in Adults with Schizophrenia and Youth at Clinical-High Risk for Psychosis: A Comprehensive Psychometric Analysis. *Schizophrenia Bulletin*.

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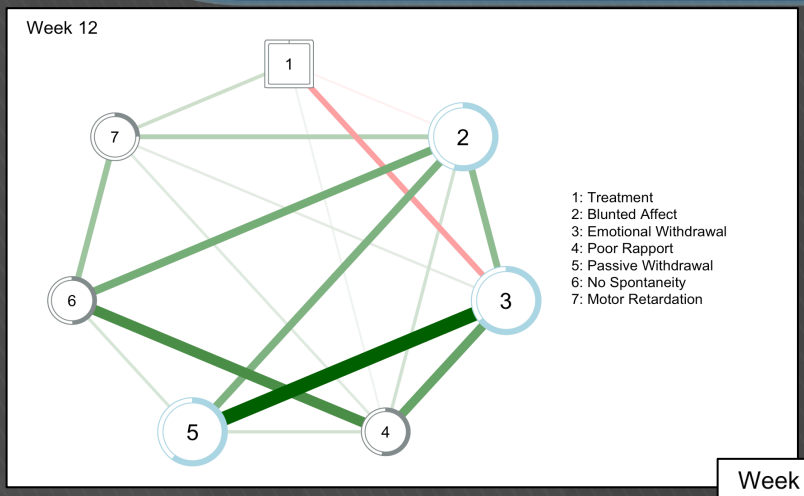
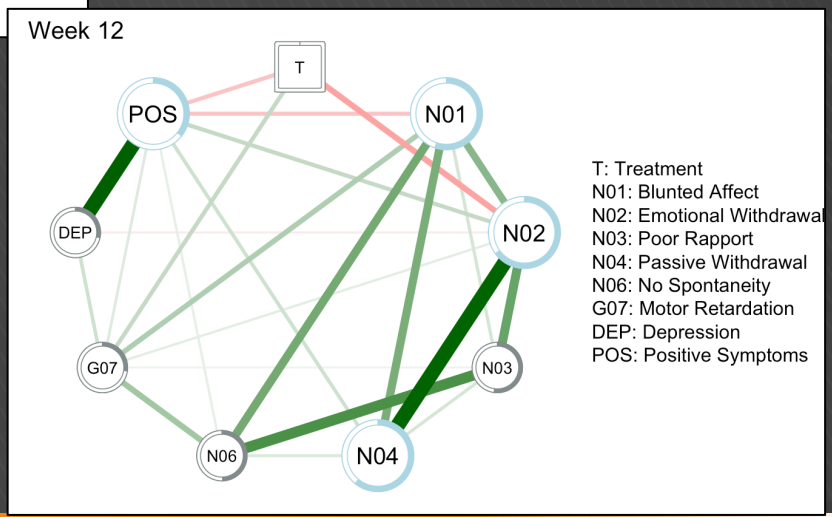
NEGATIVE SYMPTOM TREATMENT

Recent evidence supports the efficacy of Roluperidone, a novel cyclic amide derivative with high affinities for 5-hydroxytryptamine 2A, sigma2, and alpha-1 adrenergic receptors for the treatment of negative symptoms in schizophrenia. Using the phase 2B trial data and network analysis, we previously demonstrated that the compound achieved its efficacy through an effect on avolition.



Using the Phase 3 trial data, James et al. extended those findings using network intervention analysis which isolates the direct effect of individual symptom domains relative to placebo. Results replicated the prior finding, indicating that the PANSS negative symptom item most relevant to avolition (emotional withdrawal), drove the treatment effects.

Additionally, avolition's effects were not a byproduct of secondary sources of negative symptoms improving, such as positive and depressive symptoms. Roluperidone had a direct effect on positive symptoms as well, supporting its promise as a monotherapy.



James, S. H., Ahmed, A. O., Harvey, P. D., Saoud, J. B., Davidson, M., Kuchibhatla, R., Luthringer, R., & Strauss, G. P. (2024). Network intervention analysis indicates that roluperidone achieves its effect on negative symptoms of schizophrenia by targeting avolition. European neuropsychopharmacology, 87, 18-23

Strauss, G. P., Zamani Esfahlani, F., Sayama, H., Kirkpatrick, B., Opler, M. G., Saoud, J. B., ... & Luthringer, R. (2020). Network analysis indicates that avolition is the most central domain for the successful treatment of negative symptoms: evidence from the roluperidone randomized clinical trial. *Schizophrenia Bulletin*, *46*(4), 964-970.

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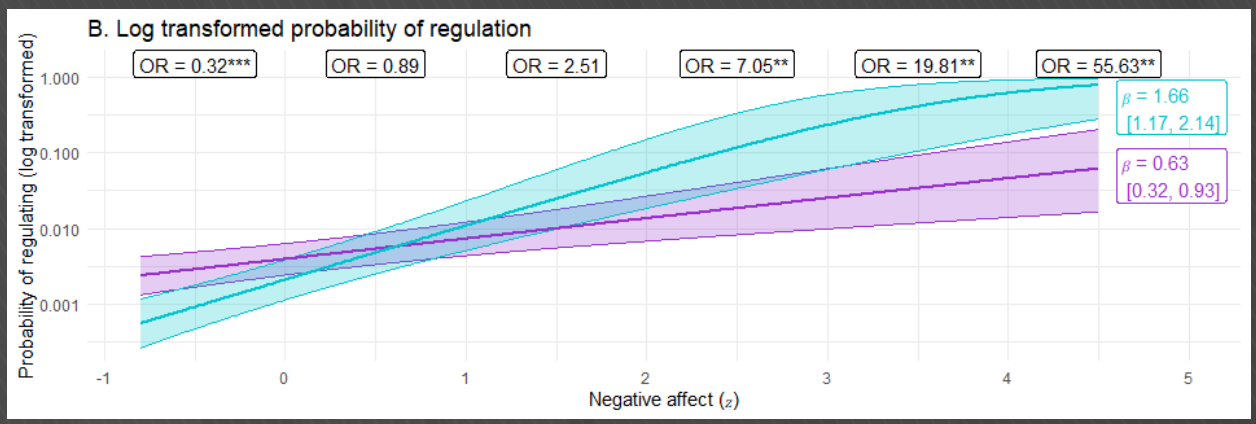
EMOTION REGULATION

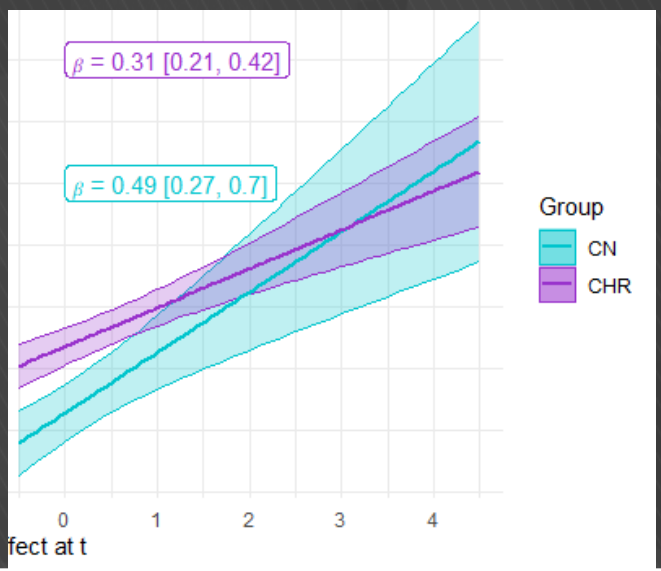
We have systematically evaluated the nature and moderators of abnormalities at the identification, selection, and implementation stages of emotion regulation in schizophrenia over the past several years. In 2024, we extended these investigations to those at clinical high-risk for psychosis (CHR) using ecological momentary assessment. The profile observed is similar to full psychosis.



Implementation stage (i.e., executing the selected strategy) abnormalities were indicated by being less effective at decreasing the intensity of negative affect from time t to t+1.

At the identification stage (i.e., determining the need to regulate), regulatory attempts were made too frequently and with too much effort at low levels of negative affect and not frequently enough and with insufficient effort at high levels of negative affect.

Selection stage abnormalities (i.e., choosing the exact strategy to attempt based on context) were characterized by increased frequency of selecting individual strategies and greater polyregulation (i.e., use of multiple strategies concurrently).



Strauss, G.P., Raugh*, I.M., Visser*, K.F., Walker, E.F., Mittal, V.A. (2025). Deconstructing the nature of emotion regulation impairments at the identification, selection, and implementation stages in individuals at clinical high-risk for psychosis. *Psychological Medicine*.

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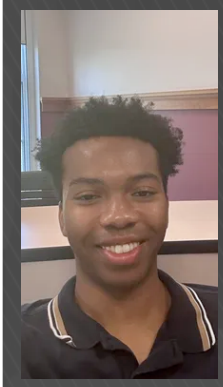
ONGOING STUDIES

We conducted 6 studies in the lab during 2024, which entailed working with > 250 participants who volunteered > 2000 hours of their time. We finished baseline data collection for 2 major R01 grants focused on psychosis risk: Computerized Assessment of Psychosis Risk (CAPR) and Psychosis Risk Outcomes Network (ProNet). Longitudinal evaluations are continuing for these studies in 2025.

PSYCHOSIS RISK OUTCOMES NETWORK

Zach Carter Lauren Jennings Zhixin Zhang



Evaluates biomarkers and clinical factors predicting conversion to psychosis.

GEORGIA AND ILLINOIS NEGATIVE SYMPTOM STUDY

Ashley Zollicoffer

Develops and validates novel methods for assessing negative symptoms in youth at risk for psychosis.

COMPUTERIZED ASSESSMENT OF PSYCHOSIS RISK

Lauren Arnold Ada Hutcheson Justin Barolette



Develops and validates a novel computerized screening battery for the early identification of psychosis

COGNITIVE TRAINING FOR EMOTION REGULATION IN SCHIZOPHRENIA

Lauren Luther Anna Knippenberg


Examines the efficacy of a cognitive training program for enhancing emotion regulation via a direct mechanistic effect on the prefrontal cortex.

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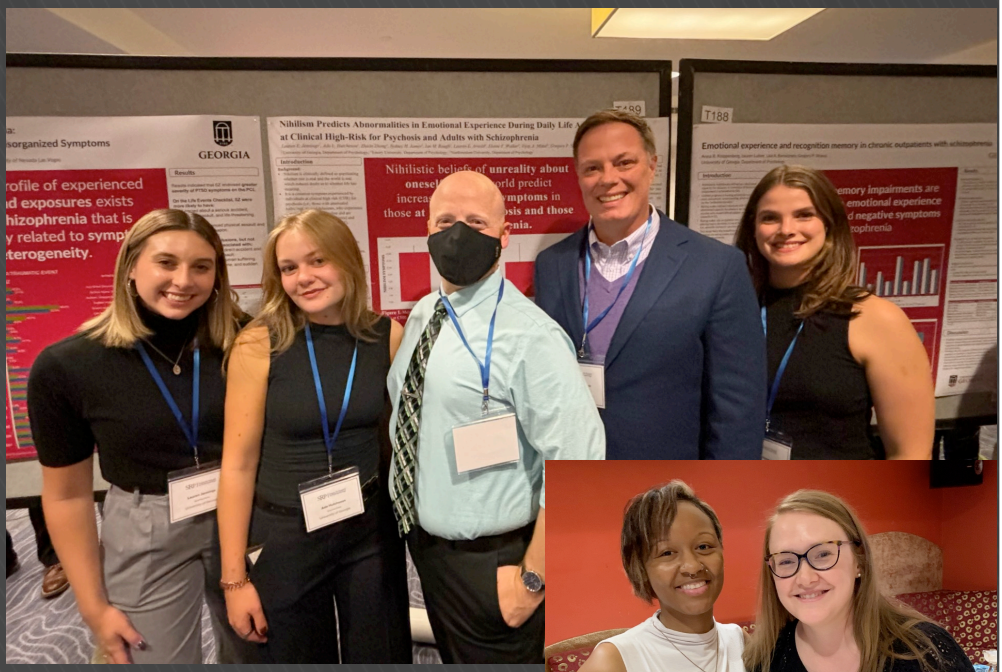
LAB MEMBER ACCOMPLISHMENTS, DEPARTURES, ARRIVALS

In 2024, we welcomed 1 new research coordinator, Justin Barolette, to the team and celebrated Dr. Lauren Luther and Ashley Zollicoffer as they achieved their goals of obtaining a faculty position at UAB and acceptance to a PhD program at LSU. We're so very proud of the accomplishments and hard work of our team members!

1st First Author Publication:
Anna Knippenberg
Ashley Zollicoffer

Thesis Defended:
Anna Knippenberg
Sydney James
Luyu Zhang

Passed Comps:
Sydney James
Luyu Zhang



Alumni Accomplishments:
Ian Raugh (New Postdoctoral Fellow, McGill University)
Ivan Ruiz (Neuropsychologist, UCLA)

Conference Presentations: at Society for Affective Science, Society for Research in Psychopathology, and Schizophrenia International Research Society-- Ada Hutcheson, Lauren Jennings, Zach Carter, Zhixin Zhang, Anna Knippenberg, Dr. Luther, Dr. Strauss.

Promotions: Dr. Luther, Assistant Professor of Psychology, UAB
Dr. Strauss, Full-Professor and Franklin Professor of Psychology

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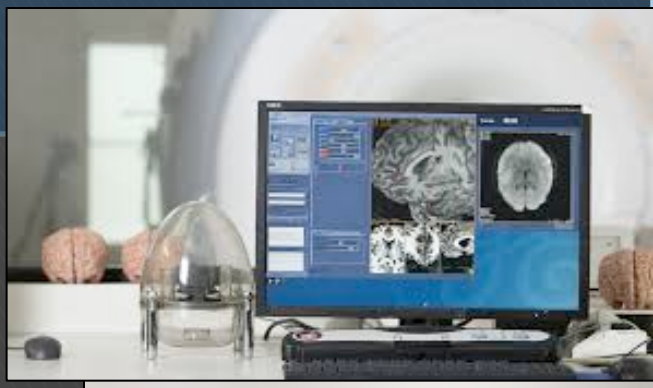
GRATITUDE AND ACKNOWLEDGMENTS

We wish to express sincere gratitude to the many individuals who have contributed to the success of our research and lab in 2024. We are grateful for your hard work and support of our endeavors which would not have occurred with out your efforts.

We are especially thankful for the participants who dedicated their time to completing our research, as well as their families who have supported these activities.



We are also grateful for the agencies and clinicians who have referred participants to our studies and our scientific collaborators throughout the world.

Within UGA, we cannot thank the "6th man" on our team enough, the Owens Institute for Behavioral Research. There are so many invaluable ways they support our research, particularly Kim Cherewick, Jenny Claire Carey, Stacie Isbell, and Chris Thornton.

We're also very grateful for the support provided at the Biomedical Imaging Research Center by TJ Hardy and Drs. Clementz and Zhao, as well as the many staff in the UGA IRB office, grants office, department of psychology, and Dean's offices who support research.