

Lydia Rader
Curriculum vitae
August 2025

Postdoctoral Associate
Email: Lydia.Rader@colorado.edu

EDUCATION

- 2025 Dual Ph.D., Behavioral, Psychiatric, and Statistical Genetics & Neuroscience,
Institute for Behavioral Genetics, University of Colorado Boulder,
Doctoral Dissertation: Genetically informed approach to disentangle relationships
between chronic pain, executive functions, and substance use.
Advisor: Naomi Friedman Ph.D.
- 2023 M.A., Behavioral, Psychiatric, and Statistical Genetics,
Institute for Behavioral Genetics, University of Colorado Boulder
Master's Thesis: Associations between adolescent pain and psychopathology in the
Adolescent Brain Cognitive Development (ABCD) study.
Advisor: Naomi Friedman Ph.D.
- 2020 MSc, Genes, Environment & Development in Psychiatry & Psychology
Social, Genetic, & Developmental Psychiatry, King's College London
Master's Thesis: Genetic and environmental associations of fatigue, depression, and
childhood adversity in a Sri Lankan Twin & Singleton study
Advisors: Helena Zavos Ph.D., Fruhling Rijdsdijk Ph.D.
- 2018 B.A., Psychology
Department of Psychology, George Mason University
One-year abroad at Oxford University
Latin Honors Summa Cum Laude

EMPLOYMENT

- 2025–Present Postdoctoral Associate
The Gustavson Lab – University of Colorado Boulder, Boulder, Colorado
- Engineered and validated longitudinal substance use phenotypes from large-scale cohort studies (e.g., ABCD) by harmonizing multi-wave survey and genetic data into binary and continuous variables
 - Conducted secondary data analyses integrating genetic and cohort study data to identify associations between adolescent music and sports engagement and substance use
 - Executed complex modeling workflows using R including twin modeling and polygenic scores
 - Drafted 2 first-author manuscripts
- 2021–2025 Graduate Research Assistant
The Friedman Lab – University of Colorado Boulder, Boulder, Colorado
- Led 5 research projects to gain epidemiological insights into mental health, substance use, and chronic pain with big datasets (e.g., U.K. Biobank)
 - Wrangled data for large, longitudinal observational datasets (e.g., ABCD study)
 - Published 3 first author papers, have 2 submitted, and co-authored 3 papers

- Trained in both molecular-based (e.g., GWAS, PGS) and family-based (e.g., Co-twin control, Twin models) statistical genetic methodologies
- Experienced in structural equation modeling
- Performed various statistical analyses and data processing using R, Python, & Mplus

- 2024–2025 Graduate Research Assistant
The Cooperative Institute for Research in Environmental Sciences – Remote
- Designed and implemented large-scale longitudinal surveys using Qualtrics
 - Used R to clean and process longitudinal network data
 - Created social network analysis maps in Kumu
 - Delivered clear, actionable reports and visualizations to stakeholders on findings from the data
- 2021–2022 Data Analyst Internship
The Parkinson’s Foundation – Remote
- Helped design, process, and analyze a hospitalization survey
 - Conducted quantitative and qualitative analyses on survey data
 - Integrated survey and geospatial data to uncover contextual factors driving research engagement
 - Collaborated on project reports for both academic and public audiences
 - Proposed data-driven strategies to increase engagement of underserved communities in Parkinson’s Disease research

MANUSCRIPTS

Peer-reviewed Journal Articles:

1. **Rader, L.**, Wager, T.D., Friedman, N.P. Chronic pain is specifically associated with updating working memory: a longitudinal twin study. *PAIN*, 166, 212-221 (2025). <https://doi.org/10.1097/j.pain.0000000000003347>. PMCID: PMC11750124.
2. Chiesa, S.T., **Rader, L.**, Garfield, V., Foote, I., Friedman, N.P., Suri, S., Smith G.D., Hughes, A.D., Richardson, T.G. Childhood adiposity underlies numerous adult brain traits attributed to midlife obesity. *Brain*, 148, 133-142 (2025). <https://doi.org/10.1093/brain/awae198>. PMCID: PMC11706278.
3. **Rader, L.**, Reineberg A.E., Petre, B., Wager, T.D., Friedman, N.P. Familial effects account for association between chronic pain and past month smoking. *European Journal of Pain*, 28, 1144-1155 (2024). <https://doi.org/10.1002/ejp.2247>. PMCID: PMC11269048.
4. **Rader, L.**, Freis, S.M. & Friedman, N.P. Associations between adolescent pain and psychopathology in the Adolescent Brain Cognitive Development (ABCD) study. *Behavior Genetics*, 53, 232-248 (2023). <https://doi.org/10.1007/s10519-023-10138-x>. PMCID: PMC10246734.
5. Watts R., **Rader, L.**, Grant, J., Filippi, C.G. Genetic and environmental contributions to subcortical gray matter microstructure and volume in the developing brain. *Behavior Genetics*, 53, 208-218 (2023). <https://doi.org/10.1007/s10519-023-10142-1>. PMCID: PMC10154259.
6. Feeney M., Duda J., Hiller A., Phillips J., Evers C., Yarab N., Todaro V., **Rader, L.**, Rosenfeld S. Understanding health care needs among Veterans with Parkinson’s disease: A survey study. *Frontiers in Neurology*, 13, 924-999 (2022). <https://doi.org/10.3389/fneur.2022.924999>. PMCID: PMC9405651.

Publications Under Review:

7. **Rader, L.**, Zorina-Lichtenwalter, K., Hatoum, A. S., Stallings, M.C., Wager, T.D., Friedman, N.P. (under review). Genetic overlap of chronic pain, musculoskeletal-specific pain, substance use disorders, and substance use consumption: Common addiction and substance-specific effects.
8. Zorina-Lichtenwalter, K., Bango, C.I., **Rader, L.**, Ceko, M., Petre, B., Wager, T.D., Friedman, N.P., (under review). Structural grey matter associations with chronic pain in the 40,000-person UK Biobank sample.
9. **Rader, L.**, Zorina-Lichtenwalter, K., Gustavson, D., Wager, T.D., Friedman, N.P. (under review). Genetic associations link adolescent pain complaints to adult chronic pain risk: a polygenic score analysis using the ABCD study.

Selected Publications in Preparation:

10. **Rader, L.**, Maes, H., Gustavson, D. (in final preparation). Genetic, environmental, gene-by-environment, and causal associations between adolescent music engagement and later substance use: a twin and genomic perspective.
11. Vilar-Ribo, L., Jennings, M.V., Sallah, A., Jinwala, Z., Meredith, J., Thorpe, H., **Rader, L.**, Courchesne-Krak, N., Niarchou, M., Balbona, J., Johnson, E., Davis, L.K., Hatoum, A., Mallard, T., Gustavson, D., Zhou, H., Palmer, A., Savage, J., Kember, R., Sanchez-Roige, S.. Sex-specific Genetic Architecture Comorbidities of Alcohol Use Behaviors.

AWARDS & HONORS

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| 2025 | Collegiality and Scholarship Excellence Award: awarded for scholarly focus and contribution, Graduate and Professional Student Government, University of Colorado Boulder |
| 2025 | Daniel's Fund Case Competition Finalist: Selected as a national finalist for essay on the ethics of personalized medicine and AI, Bill Daniel's Fund |
| 2024 | Sean E Hudson Leadership Award: awarded for leadership in scientific community, Department of Psychology & Neuroscience, University of Colorado Boulder |
| 2023 | Carol Becker Lynch Award: awarded for outstanding behavior genetics research, Institute for Behavioral Genetics |
| 2023 | Rowe Award: awarded for outstanding poster presentation, presented at the Behavior Genetics Association Annual Meeting |

RESEARCH EXPERIENCE

Research Support as Graduate Student, Postdoctoral Associate

- 2025-Present **Postdoctoral Associate (80%):** National Institute on Drug Abuse Grant: *Vulnerability to Substance Use: Transitions and Trajectories in ABCD Youth with Validation Using*

Longitudinal Twin Family Samples. (R01 DA063061). University of Colorado Boulder.

- 2025-Present **Postdoctoral Associate (20%):** National Institute on Drug Abuse Grant: *Establishing if Music Engagement is a Protective Factor in Adolescent Substance Use Using Existing Longitudinal, Genetic, and Environmental Datasets.* (R01 DA059804). University of Colorado Boulder.
- 2023-2025 **Graduate Research Assistant:** National Institute for Mental Health Pre-Doctoral Training Grant: *Research Training: Mental Health Behavior Genetics* (T32 MH016880). University of Colorado Boulder.
- 2021-2023 **Graduate Research Assistant:** *Brain and Genetic Predictors of Individual Differences in Pain and Placebo Analgesia*, University of Colorado Boulder (R01 DA046064).

PRESENTATIONS

Papers presented at conferences

- 2024 **Rader, L.,** Zorina-Lichtenwalter, K., Gustavson, D.E., Wager, T.D., Friedman, N.P. (June, 2024). *Do chronic pain polygenic scores derived in older adults in the U.K. Biobank (UKB) predict adolescent pain reports in the Adolescent Brain Cognitive Development (ABCD) study?* [Oral presentation]. Behavior Genetics Association, London, United Kingdom.
- 2023 **Rader, L.,** Zorina-Lichtenwalter, K., Grotzinger, A. D., Friedman, N.P. (October, 2023). *Genetic overlaps between chronic pain, substance use disorders and nucleus accumbens volume.* [Poster presentation]. World Congress of Psychiatric Genetics, Montreal, Canada.
- 2023 **Rader, L.,** Wager, T.D., Friedman, N.P. (June, 2023). *Working memory is genetically associated with young adult chronic pain: Results from a longitudinal twin study* [Oral presentation]. Behavior Genetic Association Annual Meeting, Murcia, Spain, United States.
- 2023 **Rader, L.,** Freis, S.M. & Friedman, N.P. (June, 2023) *Associations Between Adolescent Pain and Psychopathology in the Adolescent Brain Cognitive Development (ABCD) Study* [Poster presentation]. Behavior Genetic Association Annual Meeting, Murcia, Spain, United States.
- 2022 **Rader, L.,** Reineberg A.E., Petre, B., Wager, T.D., Friedman, N.P (June, 2022). *Familial effects account for relationship between past month tobacco frequency and presence of a current pain episode* [Poster presentation]. Behavior Genetic Association Annual Meeting, Los Angeles, CA, United States.

Other Presentations

- 2019 **Rader, L.,** Rijdsdijk, F., Zavos, H. (September, 2019). *Genetic and environmental associations of fatigue, depression, and childhood adversity in a Sri Lankan Twin & Singleton study* [Poster presentation]. King's College London Hospital, London, England.

TEACHING EXPERIENCE

2024-2025	Advised Honors Thesis project at the University of Colorado Boulder
2024	Grader for the undergraduate Sports Psychology course (PSYC 4541; Spring 2024)
2023	Teaching assistant for the undergraduate Foundations of Neuroscience II lab and developed lab curriculum for the course (NRSC 2125; Fall 2023)
2022	Grader for the undergraduate/graduate Behavioral Neuroendocrinology course (NRSC 4092/5092; Fall 2022)
2022	Teaching assistant for the undergraduate Foundations of Neuroscience I lab and developed lab curriculum for the course (NRSC 2100; Fall 2022)
2022	Teaching assistant for the undergraduate Biological Psychology course (PSYC 2012; Spring 2022)
2021	Teaching assistant for the undergraduate Psychological Science I: Statistics lab (PSYC 2111; Fall 2021)

WORKSHOPS

2023	International Workshop on Statistical Genetic Methods for Human Complex Traits (Genomic methods), Boulder, CO. March 2023
2022	fMRI Acquisition and Analysis Course, Remote. August 2022
2021	International Workshop on Statistical Genetic Methods for Human Complex Traits (Biometrical methods), Remote. March 2021.
2021	University of Oxford FSL Course, Remote. October 2021.
2019	Summer School Twin Data Analysis Workshop, London, UK. June 2019

SERVICE TO PROFESSION

Served as a Peer Reviewer for the Following Journals

European Addiction Research
PAIN Reports
Journal of Pain Research

Policy & Advocacy

2024-2025	Chief Executive Officer for Knowing Neurons, a student-run, volunteer-based neuroscience communication and outreach nonprofit. Managed 8 teams of over 100+ early career scientists from over 40 institutions and spanning over 15 countries.
2024-2025	Advocate for American Society of Human Genetics. Participated in Capitol Hill meetings for NIH funding. Assisted in human genomics education presentation for Congress

members. Contributed to Outside Witness Testimony on the importance of human genomic research

- 2023-2025 Biopsychology Science Student Council Representative for the American Psychological Association. Participated in Capitol Hill meetings for NIH funding. Assisted with APA convention programming. Revised reviewer training module *Translational Issues for Psychological Science* reviewer training and topic selection. Reviewed grant applications for APA Early Graduate Student Research Award & the APA Summer Undergraduate Psychology Experience in Research Fellowship.
- 2023-2024 Head of Fundraising for Knowing Neurons, a student-run, volunteer-based neuroscience communication and outreach nonprofit. Drafted, reviewed, and awarded 3 grants totaling over \$20,000+ to support youth science outreach work. Projects included a translation project, translating science findings into 6 languages; neuroscience workshops in rural and lower income high schools; and a science policy paper competition for early career scientists
- 2023-2024 Science Diplomacy Social Coordinator at National Science Policy Network. Organized and facilitated programming for the science diplomacy committee.

PROFESSIONAL MEMBERSHIPS

- 2023-Present American Psychological Association
2022-Present Behavior Genetics Association
2021-Present Association for Women in Science
2023-2024 American Society of Human Genetics
2023-2024 World Congress of Psychiatric Genetics