**Emma C Johnson, PhD**

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Washington University School of Medicine Website: [emmacjohnson.com](http://emmacjohnson.com/)

4560 Clayton Ave, Suite 1000 [Google Scholar profile](https://scholar.google.com/citations?user=PCeeUTMAAAAJ&hl=en)

St. Louis, MO 63110

**Education**

**PhD, Psychology - Behavioral, Psychiatric, and Statistical Genetics**

University of Colorado Boulder Aug 2017

Boulder, CO

*Advisor*: Matthew Keller, Ph.D.

*Dissertation*: “The genetic etiology of schizophrenia and other complex traits: novel insights from existing genome-wide datasets”

**MA, Psychology - Behavioral, Psychiatric, and Statistical Genetics**

University of Colorado Boulder April 2016

Boulder, CO

**BSPH, Biostatistics**

**BA, Biology**

University of North Carolina at Chapel Hill May 2013

Chapel Hill, NC

**Positions**

**Assistant Professor**

Department of Psychiatry July 2022 - current

Washington University School of Medicine

St. Louis, MO

**Instructor**

Department of Psychiatry Dec 2020 – July 2022

Washington University School of Medicine

St. Louis, MO

**Postdoctoral Research Associate**

Department of Psychiatry Sept 2017 - Dec 2020

Washington University School of Medicine

St. Louis, MO

*Mentor:* Arpana Agrawal, Ph.D.

*Research Focus:* Genetics of substance use disorders; genetic overlap and sources of comorbidity amongst substance use disorders and other psychiatric conditions

**Grant Support**

*Active*

**Hevolution/AFAR #HEV~NI24021**

12/2024-11/2027

“Elucidating environmental context-dependent genetic variation related to aging and lifespan in humans.”

Role: PI

The existence of genetic variation associated with aging and lifespan is somewhat of an evolutionary paradox: alleles associated with shorter lifespan and accelerated aging are expected to be purged by natural selection, according to evolutionary theory. Yet there is substantial genetic variation underlying lifespan and aging – why is this the case? In the first aim of this application, I propose to perform genome-wide interaction studies (GWIS) using data from the UK Biobank and All of Us to identify genetic variation associated with lifespan and aging traits under certain environmental contexts related to diet, physical activity, social connectedness, and sleep, four factors that are highly relevant to human health. In the second aim, I will characterize the environmental context-dependent genetic variation according to biological function and evolutionary history (e.g., evidence of selection pressure).

**NIDA R03DA059747**

9/15/2023 – 8/31/2025

“Using genomics and extensive phenotyping to dissect the relationships between substance use disorders and chronic pain”

Role: PI

Substance use disorders and chronic pain frequently co-occur, yet the mechanisms driving their comorbidity are poorly understood. This application proposes to leverage whole genome sequence data and electronic health records data on chronic pain (including its subtypes) and substance use disorders (alcohol, tobacco, cannabis, and opioids) to better understand their relationship across multiple domains (phenotypic, genomic, biological overlap) and all represented ancestry groups in the All of Us program. The findings from this proposal will inform our understanding of the relationships between SUDs and chronic pain and eventually lead to improved treatment and prevention efforts.

**NIDA K01DA051759**

4/1/21 - 3/31/26

“Identifying genetic sources of comorbidity between cannabis and schizophrenia using genome-wide and integrative omics data”

Role: PI

Cannabis involvement is heritable and is more common in those with psychosis-related behaviors and schizophrenia, but the contributions to this comorbidity remain unclear. This K01 application aims to better understand the specific variants, genes, and biological pathways that underlie these behaviors, incorporate multi-omics data from human and rodent studies to prioritize variants for functional follow-up studies, and examine whether polygenic risk for comorbid cannabis use disorder and schizophrenia predicts psychosis-related behaviors in population- based and/or high-risk samples.

**CDC grant subcontract: U01 DD001297-01-00**

7/1/22 - 6/30/26

“Study to Explore Early Development (SEED) Follow Up Studies, Components A,B,D & E”

Role: PI of subcontract with Johns Hopkins (named as PI after Dr. Constantino’s transfer to Emory University)

The work proposed here, SEED Follow-up Studies (SEED FU), will maximize the impact of extant SEED data through analyses that characterize autism spectrum disorder phenotypes and assess the potential interplay between genetic and modifiable risk factors.

**NINR R90NR021799**

08/2024-07/2029

“PRomoting Excellence through Pain and Addiction Research Enhancement (PREPARE).”

Role: Co-I (PI: Burel Goodin)

We propose the Promoting Excellence through Pain and Addiction Research Enhancement (PREPARE) Program with the long-term goal of creating the next generation of investigators who will advance science through cutting edge clinical research that helps relieve pain and ameliorate SUD.

**NIAAA 1 R01 AA030563-01A1**

8/16/23-5/31/27

“The role of remission in the intergenerational transmission of alcohol use disorder: Course, context, and offspring outcomes”

Role: Co-I (PI: McCutcheon)

This project is a study of remission from alcohol use disorders (AUDs), also known as recovery, and how remission in parents influences the home environment and alcohol use of adolescent and adult children. We seek to understand whether parental remission can reduce the likelihood of alcohol problems in their children, despite genetic risk for alcohol problems, and thereby reduce the transmission of AUDs from one generation to the next.

**NIDA 5 R01 DA054869-03**

4/1/21-1/31/26

“7/7 Psychiatric Genomics Consortium: Advancing Discovery and Impact”

Role: Co-I (MPI: Agrawal, Edenberg, Gelernter)

Now in its 13thyear, the Psychiatric Genomics Consortium is perhaps the most innovative and productive experiment in the history of psychiatry. We propose to expand the work of the PGC so we can learn key lessons about the fundamental basis of major psychiatric disorders.

*Past*

**NIAAA F32AA027435**

12/1/18 - 11/30/20

“Identifying Contributions to the Genetic Correlation Between Alcohol Use Disorders and Schizophrenia”

Role: PI

This fellowship proposes intensive training in bioinformatics and cutting-edge statistical genetics methods via workshops and hands-on mentoring, with the goal of better understanding the genetic influences underlying the common comorbidity of alcohol dependence and schizophrenia.

**AFSP Young Investigator Innovation Grant**

11/1/19 - 10/31/21

**“**Elucidating the Polygenic Architecture Underlying Suicidal Thoughts and Behaviors”

Role: PI

This grant aims to elucidate the genetic etiology of suicidal thoughts and behaviors, their polygenic overlap with death by suicide, depression, risk-taking, and cognitive vulnerability, and to examine the role of individual liability for problematic drinking and familial risk for alcoholism, over and above family history of suicide, in the development of suicidal thoughts and behaviors.

**BBRF Young Investigator Grant**

1/15/21 - 1/14/23

“The Impact of Prenatal Cannabis Exposure on Placental Epigenetics – Implications for Newborn Brain and Socio-Emotional Development”

Role: PI

This young investigator grant proposal seeks to supplement an ongoing study of marijuana use among pregnant mothers by evaluating associations between marijuana use during pregnancy, placental epigenetic signatures, and psychiatrically-relevant child outcomes. This multimodal project adopts highly innovative and integrative approaches that traverse levels of analysis (i.e., epigenetic signatures in placental tissue, newborn/infant MRI and cognitive and emotion assessment) to inform our understanding of the interactive molecular, neural, and behavioral mechanisms underlying prenatal marijuana exposure and psychopathology risk.

**Awards and Honors**

2024 Research Society on Alcohol Early Career Investigator Award

2024 Federation of Associations in Behavioral & Brain Sciences Early Career Impact Award

2023 Winner of the 2023 Illumina Polygenic Risk Scores Research Grant Contest

2023 Reviewer’s Choice Abstract *(American Society for Human Genetics 2023 Meeting)*

2021 NIDA-NIAAA Early Career Investigator Showcase awardee

2019 Early Career Investigator Program - Oral Presentation Award winner (*WCPG meeting 2019*)

2019 Early Career Investigator Program - Travel Award (*WCPG meeting 2019*)

2019 RSA Memorial Award (*RSA meeting 2019)*

2019 Junior Investigator Travel Award *(RSA meeting 2019)*

2018 Travel Award – Pathway to Drugs meeting (*Copenhagen, DK*)

2017 Reviewer’s Choice Abstract *(American Society for Human Genetics 2017 Meeting)*

2016 Graduate School Domestic Travel Grant *(CU Boulder)*

2015 Behavior Genetics Association Travel Award

2012 Summer Undergraduate Research Fellowship *(UNC Chapel Hill)*

2009-2013 Irving Jacob Reuter Award of The Community Foundation of Western NorthCarolina *(Full scholarship for undergraduate education)*

**Invited Presentations**

December 2024: ““Chronic pain and substance use: exploring genetics, social determinants of health, and other risk and protective factors”, presented for the Institute for Behavioral Genetics’ “First Friday” talk series.

April 2024: “Using genome-wide approaches to better understand suicidal thoughts and behaviors and substance use disorders”, presented as part of the American Foundation for Suicide Prevention Nebraska chapter’s Research Connection event.

May 2022: “Using genome-wide approaches to understand the genetic etiology of suicide-related behaviors and substance use disorders”, presented as part of the American Foundation for Suicide Prevention’s inaugural Research Connection+ event (<https://researchconnectionplus.attendease.com/> )

May 2021: “Genetics of substance use and related traits: insights, complexities, and challenges”, presented at the Institute for Behavioral Genetics mini-conference *(virtual keynote due to COVID-19 circumstances)*

April 2020: “Using a variety of genome-wide methods to investigate the shared genetic underpinnings of alcohol use disorder and schizophrenia”, presented at the Center for Studies on Addiction 2019-2020 seminar series at the University of Pennsylvania. *(virtual seminar due to COVID-19 circumstances)*

**Conference Symposium Chair (Proposal Development & Chair of Session)**

06/2024 Considering the impact of evolution and population dynamics on behavioral and neuropsychiatric phenotypes, Behavioral Genetics Association, London, UK

05/2024 Leveraging the All of Us biobank to make strides in substance use disorder genomics research, NIDA Genetics and Epigenetics Cross-Cutting Research Team, Bethesda, MD

06/2022 Genomic structural equation modeling and polygenic score approaches to understanding substance use and related behaviors, Behavioral Genetics Association, Los Angeles, CA

06/2019 Genome-wide approaches to understanding the comorbidity between problematic alcohol use and other psychiatric disorders, Research Society on Alcohol, Minneapolis, MN

**Publications (78)**

**Total number of citations = 4,634**

**H-index = 27; M-quotient = 3**

# Indicates paper where I served as mentor

# Gorelik A, … Agrawal A, Bogdan R, **Johnson EC**. Associations Between Polygenic Scores for Cognitive and Non-cognitive Skills and Measures of Behavior and Psychopathology in the Adolescent Brain Cognitive Development Study. *Psychological Medicine* (2024). <https://doi.org/10.1017/S0033291724002174>

**Johnson EC,** et al. Cross-ancestry genetic investigation of schizophrenia, cannabis use disorder, and tobacco smoking. *Neuropsychopharmacology* (2024) <https://doi.org/10.1038/s41386-024-01886-3> (\*see commentary on this paper: <https://doi.org/10.1038/s41386-024-01898-z> )

Dempster EL, et al. **[middle author]** Methylomic signature of current cannabis use in two first-episode psychosis cohorts. *Molecular Psychiatry*. 2024 Oct 16:1-0. <https://doi.org/10.1038/s41380-024-02689-0>

Austin-Zimmerman I, Spinazzola E, Quattrone D, Wu-Choi B, Trotta G, Li Z, **Johnson EC**, Richards AL, Freeman TP, Tripoli G, Gayer-Anderson C. The impact of schizophrenia genetic load and heavy cannabis use on the risk of psychotic disorder in the EU-GEI case-control and UK Biobank studies. *Psychological medicine.* 2024 Nov;54(15):4160-72. <https://doi.org/10.1017/S0033291724002058>

Paul SE, Colbert SM, Gorelik AJ, **Johnson EC**, Hatoum AS, Baranger DA, Hansen IS, Nagella I, Blaydon L, Hornstein A, Elsayed NM. A phenome-wide association study of cross-disorder genetic liability in youth genetically similar to individuals from European reference populations. *Nature Mental Health*. 2024 Oct 14:1-5. <https://doi.org/10.1038/s44220-024-00313-2>

Nielsen TT, Duan J, Levey DF, Walters GB, **Johnson EC**, et al. Shared genetics of ADHD, cannabis use disorder and cannabis use and prediction of cannabis use disorder in ADHD. *Nature Mental Health* (2024) <https://doi.org/10.1038/s44220-024-00277-3>

Baranger DAA, **[middle author]** Prenatal cannabis exposure, the brain, and psychopathology during early adolescence. *Nature Mental Health* (2024) <https://doi.org/10.1038/s44220-024-00281-7>

Paul SE, Baranger DAA, **Johnson EC,** et al. Alcohol milestones and internalizing, externalizing, and executive function: longitudinal and polygenic score associations. *Psychological Medicine* (2024) <https://doi.org/10.1017/S003329172400076X>

Bogdan R, Leverett SD, Constantino-Petit AM, Lashley-Simms N, Liss DB, **Johnson EC**, Lenze SN, Lean RE, Smyser TA, Carter EB, Smyser CD. Characteristics of women concordant and discordant for urine drug screens for cannabis exposure and self-reported cannabis use during pregnancy. *Neurotoxicology and Teratology* (2024) <https://doi.org/10.1016/j.ntt.2024.107351>

Toikumo S, et al. **[middle author]** Multi-ancestry meta-analysis of tobacco use disorder identifies 461 potential risk genes and reveals associations with multiple health outcomes. *Nature Human Behavior* (2024) <https://doi.org/10.1038/s41562-024-01851-6>

Koller D, et al. **[middle author]** Pleiotropy and genetically inferred causality linking multisite chronic pain to substance use disorders. *Molecular Psychiatry* (2024) <https://doi.org/10.1038/s41380-024-02446-3>

Lai D, et al. **[middle author]** Associations between alcohol use disorder polygenic score and remission in participants from high‐risk families and the Indiana Biobank. *Alcohol: Clinical and Experimental Research* (2024) <https://doi.org/10.1111/acer.15239>

Meyers JL, McCutcheon VV, Horne-Osipenko KA, Waters LR, Barr P, Chan G, Chorlian DB, **Johnson EC**, Kuo SI, Kramer JR, Dick DM. COVID-19 pandemic stressors are associated with reported increases in frequency of drunkenness among individuals with a history of alcohol use disorder. *Translational Psychiatry*. 2023 Oct 6;13(1):311. <https://doi.org/10.1038/s41398-023-02577-1>

Levey D, et al. **[middle author]** Multi-ancestry genome-wide association study of cannabis use disorder yields insight into disease biology and public health implications. *Nature Genetics* (2023) <https://doi.org/10.1038/s41588-023-01563-z>

Zhou H**,** et al. **[middle author]** Multi-ancestry study of the genetics of problematic alcohol use in over 1 million individuals. *Nature Medicine* (2023) <https://doi.org/10.1038/s41591-023-02653-5>

**Johnson EC\*,** Salvatore JE\*, Lai D, et al. The Collaborative Study on the Genetics of Alcoholism: Genetics. *Genes, Brain, and Behavior* (2023) (\*shared first authorship) <https://doi.org/10.1111/gbb.12856>

Saenz de Viteri S, Zhang J, **Johnson EC**, et al. Genomic risk for post-traumatic stress disorder in families densely affected with alcohol use disorders. *Molecular Psychiatry* (2023) <https://doi.org/10.1038/s41380-023-02117-9>

Spinazzola E, Quattrone D, et al. **[middle author]** The association between reasons for first using cannabis, later pattern of use, and risk of first-episode psychosis: the EU-GEI case–control study. *Psychological Medicine* (2023) <https://doi.org/10.1017/S0033291723001071>

# Colbert SMC, Wendt F, Pathak G, Keller MC, Polimanti R, **Johnson EC**. Declining autozygosity over time: an exploration in over 1 million individuals from three large and diverse cohorts. *The* *American Journal of Human Genetics* (2023)<https://doi.org/10.1016/j.ajhg.2023.04.007>

Xu H, Toikumo S, Crist RC, Glogowska K, Deak JD, Gelernter J, **Johnson EC,** Kranzler HR, Kember RL. Identifying genetic loci and phenomic associations of substance use traits: A multi-trait analysis of GWAS (MTAG) study. *Addiction* (2023) <https://doi.org/10.1111/add.16229>

Gorelik AJ, Paul SE, Karcher NR, **Johnson EC,** et al. A Phenome-Wide Association Study (PheWAS) of Late Onset Alzheimer Disease Genetic Risk in Children of European Ancestry at Middle Childhood: Results from the ABCD Study. *Behavior Genetics* (2023) <https://doi.org/10.1007/s10519-023-10140-3>

Pine JG, Paul SE, **Johnson EC**, et al. Polygenic Risk for Schizophrenia, Major Depression, and Post-traumatic Stress Disorder and Hippocampal Subregion Volumes in Middle Childhood. *Behavior Genetics* (2023). <https://doi.org/10.1007/s10519-023-10134-1>

Hatoum AS, Colbert SMC, **Johnson EC,** et al. Multivariate genome-wide association meta-analysis of over 1 million subjects identifies loci underlying multiple substance use disorders. *Nature Mental Health* (2023) <https://doi.org/10.1038/s44220-023-00034-y>

**Johnson EC**, Paul SE, Baranger D, et al. Characterizing alcohol expectancies in the ABCD Study: associations with sociodemographic factors, the immediate social environment, and relevant polygenic scores. *Behavior Genetics* (2023) <https://doi.org/10.1007/s10519-023-10133-2>

# Colbert SMC, … **Johnson EC**. Polygenic contributions to suicidal thoughts and behaviors in a sample ascertained for alcohol use disorders. *Complex Psychiatry* (2022) <https://doi.org/10.1159/000529164>

**Johnson EC,** Colbert SMC, et al. Associations between cannabis use, polygenic liability for schizophrenia, and cannabis-related experiences in a sample of cannabis users. *Schizophrenia Bulletin* (2022) <https://doi.org/10.1093/schbul/sbac196>

Bogdan R, Hatoum AS, **Johnson EC,** Agrawal A. Genetically Informed Neurobiology of Addiction: An Integration of Neuroimaging and Genomic Studies. *Nature Neuroscience Reviews* (2022) <https://doi.org/10.1038/s41583-022-00656-8>

# Colbert SMC, **Johnson EC.** Commentary on Lannoy et al.: The continued value of within-family designs in addiction and psychiatric research. *Addiction* (2022) <https://doi.org/10.1111/add.16040>

# Colbert SMC, Keller MC, Agrawal A, **Johnson EC**. Exploring the relationships between autozygosity, educational attainment, and cognitive ability in a contemporary, trans-ancestral American sample. *Behavior Genetics.* (2022) <https://doi.org/10.1007/s10519-022-10113-y>

Baranger DAA, Paul SE, Colbert SMC, Karcher NR, **Johnson EC,** et al. Association of Mental Health Burden with Prenatal Cannabis Exposure from Childhood to Early Adolescence: Longitudinal Findings from the Adolescent Brain Cognitive Development (ABCD) Study. *JAMA Pediatrics*. Published online September 12, 2022. <https://doi.org/10.1001/jamapediatrics.2022.3191>

Deak J, et al. **[middle author]** Genome-wide association study in individuals of European and African ancestry and multi-trait analysis of opioid use disorder identifies 19 independent genome-wide significant risk loci. *Molecular Psychiatry* (2022) <https://doi.org/10.1038/s41380-022-01709-1>

Hatoum AS, Winiger EA, Morrison CL, **Johnson EC**, Agrawal A. Characterization of the genetic relationship between the domains of sleep and circadian-related behaviors with substance use phenotypes. *Addiction Biology* (2022) <https://doi.org/10.1111/adb.13184>

Lai D, **Johnson EC**, Colbert SMC, et al. Evaluating risk for alcohol use disorder: polygenic risk scores and family history. *Alcoholism: Clinical and Experimental Research* (2021) <http://doi.org/10.1111/acer.14772>

# Paul SE, … **Johnson EC**. Associations between cognition and polygenic liability to substance involvement in middle childhood: Results from the ABCD Study. *Drug and Alcohol Dependence* (2021) <https://doi.org/10.1016/j.drugalcdep.2022.109277>

Huggett SB, **Johnson EC**, et al. Genes identified in rodent studies of alcohol intake are enriched for heritability of human substance use. *Alcoholism: Clinical and Experimental Research* (2021) <https://doi.org/10.1111/acer.14738>

Hatoum, A.S., **Johnson, E.C.,** Colbert, S.M.C. et al. The addiction risk factor: A unitary genetic vulnerability characterizes substance use disorders and their associations with common correlates. *Neuropsychopharmacology* (2021). <https://doi.org/10.1038/s41386-021-01209-w>

# Colbert SMC, … **Johnson EC**. Exploring the genetic overlap of suicide-related behaviors and substance use disorders. *AJMG Part B: Neuropsychiatric Genetics* (2021) <https://doi.org/10.1002/ajmg.b.32880>

Colbert SMC, Funkhouser SA, **Johnson EC,** Hoeffer CA, Ehringer MA, Evans LM. Differential shared genetic influences on anxiety with problematic alcohol use compared to alcohol consumption. *AJMG Part B: Neuropsychiatric Genetics* (2021) <https://doi.org/10.1002/ajmg.b.32874>

Kapoor M, Chao M, **Johnson EC**, et al. Multi-omics integration analysis identifies novel genes for alcoholism with potential link to neurodegenerative diseases. *Nature Communications* 12, 5071 (2021). <https://doi.org/10.1038/s41467-021-25392-y>

Karcher NR, Paul SE, **Johnson EC**, et al. Psychotic-like experiences and polygenic liability in the ABCD Study. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* (2021) <https://doi.org/10.1016/j.bpsc.2021.06.012>

**Johnson EC**, et al. Investigation of convergent and divergent genetic influences underlying schizophrenia and alcohol use disorder*. Psychological Medicine* (2021) <https://doi.org/10.1017/S003329172100266X>

Hatoum AS, **Johnson EC**, Agrawal A, Bogdan R. Brain Structure and Problematic Alcohol Use: A Genetic Quasi-Experimental Test of Plausible Causation. *Brain Imaging & Behavior* (2021) <https://doi.org/10.1007/s11682-021-00482-z>

Hatoum AS, et al. [**middle author**] Genetic Liability to Cannabis Use Disorder and COVID-19 Hospitalization. *Biological Psychiatry: Global Open Science* (2021) <https://doi.org/10.1016/j.bpsgos.2021.06.005>

Hatoum AS, **Johnson EC**, et al. Polygenic Risk Scores for Alcohol Involvement Relate to Brain Structure in Substance-Naive Children: Results from the ABCD Study. *Genes, Brain and Behavior* 2021; 20:e12756. <https://doi.org/10.1111/gbb.12756>

Sherva R, et al. [**middle author**] Genome-wide association study of phenotypes measuring progression from first cocaine or opioid use to dependence reveals novel risk genes. *Exploration of medicine.* (2021) <https://doi.org/10.37349/emed.2021.00032>

**Johnson EC**, Aliev F, et al. Associations Between Suicidal Thoughts and Behaviors and Genetic Liability for Cognitive Performance, Depression, and Risk-taking in a High-risk Sample. *Complex Psychiatry* (2021) <https://doi.org/10.1159/000517169>

Palmer RHC, **Johnson EC**, Won H, Polimanti R, et al. Integration of Evidence across Human and Model Organism Studies: A Meeting Report. *Genes, Brain and Behavior.* 2021; 20:e12738. <https://doi.org/10.1111/gbb.12738>

Bountress, K., et al. [**middle author**] Potential Causal Effect of PTSD on AUD and Alcohol Consumption: A Mendelian Randomization Study. *Alcoholism: Clinical and Experimental Research,* 45, 1616– 1623<https://doi.org/10.1111/acer.14649>

**Johnson EC**, Hatoum AS, et al. The relationship between cannabis and schizophrenia: a genetically informed perspective. *Addiction* (2021). <https://doi.org/10.1111/add.15534>

Baumeister SE, Baurecht H, …. **Johnson EC**, Hung RJ. Cannabis use, pulmonary function, and lung cancer susceptibility: A Mendelian randomization study. *Journal of Thoracic Oncology* (2021) <https://doi.org/10.1016/j.jtho.2021.03.025>

Deak JD, **Johnson EC.** Genetics of substance use disorders: A review. *Psychological Medicine* (2021). <https://doi.org/10.1017/S0033291721000969>

Linnér RK, Mallard TT, et al. **[middle author]** Multivariate genomic analysis of 1.5 million people identifies genes related to addiction, antisocial behavior, and health. *Nature Neuroscience* (2021).

Mallard TT, Savage JE, **Johnson EC,** et al. Item-level genome-wide association study of the Alcohol Use Disorders Identification Test in three population-based cohorts. *American Journal of Psychiatry (*2021*).*

**Johnson EC\*,** Demontis, D\*, Thorgeirsson TE\*, et al. A large-scale genome-wide association study meta-analysis of cannabis use disorder. *The Lancet Psychiatry* (2020). (\*shared first authorship) <https://doi.org/10.1016/S2215-0366(20)30339-4>

Meyers J, Chorlian D, Bigdeli T, **Johnson EC,** et al., The Association of Polygenic Risk for Schizophrenia, Bipolar Disorder, and Depression with Neural Connectivity in Adolescents and Young Adults: Examining Developmental and Sex Differences. *Translational Psychiatry.* (2020)

Paul SE, Hatoum AS, Fine JD, **Johnson EC,** et al. Associations Between Prenatal Cannabis Exposure and Childhood Outcomes: Results from the ABCD Study. *JAMA Psychiatry* (2020). <htttps://doi:10.1001/jamapsychiatry.2020.2902>

Reynolds, T., **Johnson EC,** Huggett, S.B. et al. Interpretation of psychiatric genome-wide association studies with multispecies heterogeneous functional genomic data integration. *Neuropsychopharmacology* (2020). <https://doi.org/10.1038/s41386-020-00795-5>

Barr PB, Ksinan A, Su J, **Johnson EC**, et al. Using polygenic scores for identifying individuals at increased risk of substance use disorders in clinical and population samples. *Translational Psychiatry* (2020). <https://doi.org/10.1038/s41398-020-00865-8>

Zhou H, et al. [**middle author** of 26] Meta-analysis of problematic alcohol use in 435,563 individuals identifies 29 risk variants and yields insights into biology, pleiotropy and causality. *Nature Neuroscience* (2020) <https://doi.org/10.1038/s41593-020-0643-5>

**Johnson EC**, Chang Y, Agrawal A. An Update on the Role of Common Genetic Variation Underlying Substance Use Disorders. *Current Genetic Medicine Reports* (2020). <https://doi.org/10.1007/s40142-020-00184-w>

Polimanti R, Walters RK, **Johnson EC**, et al. Leveraging genome-wide data to investigate differences between opioid use vs. opioid dependence in 41,176 individuals from the Psychiatric Genomics Consortium. *Molecular Psychiatry* (2020). <https://doi.org/10.1038/s41380-020-0677-9>

Munn-Chernoff M, **Johnson EC,** et al. Shared Genetic Risk between Eating Disorder- and Substance-Use-Related Phenotypes: Evidence from Genome-Wide Association Studies. *Addiction Biology* (2020). <https://doi.org/10.1111/adb.12880>

Cox JW, Sherva RM, Lunetta KL, **Johnson EC**, et al. Genome-Wide Association Study of Opioid Cessation. *J. Clinical Medicine*. <https://doi.org/10.3390/jcm9010180>

**Johnson EC**\*, Sanchez-Roige S\*, et al. Polygenic contributions to alcohol use and alcohol use disorders across population-based and clinically ascertained samples. (\*shared first authorship) *Psychological Medicine*. (2020) <https://doi.org/10.1017/S0033291719004045>

Evans LM, **Johnson EC,** Melroy-Grief WE, et al. The role of *a priori-*identified addiction and smoking gene sets in smoking behaviors. *Nicotine & Tobacco Research*. <https://doi.org/10.1093/ntr/ntaa006>

Meyers JL, Chorlian DB, **Johnson EC,** et al. Association of Polygenic Liability for Alcohol Dependence and EEG Connectivity in Adolescence and Young Adulthood. *Brain Sciences*. <https://doi.org/10.3390/brainsci9100280>

Salvatore JE, et al. **[middle author]** Sibling Comparisons Elucidate the Associations between Educational Attainment Polygenic Scores and Alcohol, Nicotine, and Cannabis. *Addiction*. <https://doi.org/10.1111/add.14815>

Border R, **Johnson EC,** Evans LM, Keller MC (2019) Measurement error cannot account for failed replications of historic candidate gene-by-environment hypotheses: Response to Vrshek-Schallhorn et al. *American Journal of Psychiatry.* <https://doi.org/10.1176/appi.ajp.2019.19040374r>

Lai D, Wetherill L, Kapoor M, **Johnson EC,** et al. (2019) Genome-wide association studies of the self-rating effects of ethanol (SRE). *Addiction Biology*. <https://doi.org/10.1111/adb.12800>

Wetherill L, Lai D, **Johnson EC,** et al. (2019) Genome-wide association study identifies loci associated with liability to alcohol and drug dependence that is associated with variability in reward-related ventral striatum activity in African- and European-Americans. *Genes, Brain and Behavior*. <https://doi.org/10.1111/gbb.12580>

Meyers JL, Salvatore JE,Aliev F., **Johnson EC,** et al. (2019) Psychosocial moderation of polygenic risk for cannabis involvement: The role of trauma exposure and frequency of religious service attendance. *Translational Psychiatry*. [10.1038/s41398-019-0598-z](https://dx.doi.org/10.1038%2Fs41398-019-0598-z)

**Johnson EC,** St. PierreC.L., Meyers J., et al. (2019) The genetic relationship between alcohol consumption and aspects of problem drinking. *Alcoholism: Clinical and Experimental Research.* <https://doi.org/10.1111/acer.14064>

Border R, **Johnson EC,** Evans LM, Smolen A, Berley N, Sullivan PF, Keller MC. (2019)No support for historic candidate gene or candidate gene-by-interaction hypotheses for major depression across multiple large samples. *American Journal of Psychiatry.* <https://doi.org/10.1176/appi.ajp.2018.18070881>

**Johnson EC,** Tillman R, Aliev F, et al. (2018) Exploring the relationship between polygenic risk for cannabis use, peer cannabis use, and the longitudinal course of cannabis involvement. *Addiction.* <https://doi.org/10.1111/add.14512>

Walters RK, Polimanti R, **Johnson EC,** et al. (2018) Transancestral GWAS of alcohol dependence reveals common genetic underpinnings with psychiatric disorders. *Nature Neuroscience*. <https://doi.org/10.1038/s41593-018-0275-1>

**Johnson EC,** Evans LM, Keller MC. (2018) Relationships between estimated autozygosity and complex traits in the UK Biobank. *PLOS Genetics.* <https://doi.org/10.1371/journal.pgen.1007556>

**Johnson EC,** Border R, Melroy-Greif W, De Leeuw CA, Ehringer MA, Keller MC. (2017) No evidence that schizophrenia candidate genes are more associated with schizophrenia than non-candidate genes. *Biological Psychiatry*. <http://dx.doi.org/10.1016/j.biopsych.2017.06.033> (\*see commentary on this paper: <https://doi.org/10.1016/j.biopsych.2017.09.004>)

**Johnson EC,** Bjelland DW, Howrigan DP, et al. (2016) No Reliable Association Between Runs of Homozygosity and Schizophrenia in a Well-Powered Replication Study. *PLoS Genetics.* <https://doi.org/10.1371/journal.pgen.1006343>

**In preparation (3)**

# Indicates paper where I served as mentor

**Johnson EC\*,** Lai D\*, et al. A large, multi-ancestral GWAS of DSM-defined nicotine dependence. *Under review.* (\*shared first authorship)

# Balbona JV, Jeffries P, Gorelik AJ, Nelson EC, Bogdan R, Agrawal A, **Johnson EC**. Examining the causal genetic effects of substance use on aging. *Under review.*

# Gorelik AJ, Cunado A, Kinstler E, Constantino-Pettit A, Lenze S, Smyser CD, Rogers C, Agrawal A, Bogdan R, **Johnson EC**. Associations Between Cannabis Use and Sleep Outcomes in Pregnant Individuals. *In preparation.*

**Book Chapters**

Colbert SMC, **Johnson EC**. Genetic explanations for the association between cannabis and schizophrenia. (2023). In D’Souza D., Castle D., and Murray R. (Eds.), *Marijuana and Madness, 3rd Ed.* Cambridge, England: Cambridge University Press.

**Trainee/Mentee Record**

***Undergraduate Trainees***

2024 – current Alicia Cunado

2022 – 2023 Shuyu Lin Master’s student at the University of Michigan

***Post-bac Trainees***

|  |  |  |
| --- | --- | --- |
| 2021 – 2022 | Sarah MC Colbert | PhD student at Mount Sinai |

***Doctoral Student Committees***

|  |  |  |  |
| --- | --- | --- | --- |
| **Student** | **Advisor** | **University** | **Defense** |
| H. Modi | Bogdan/Bijsterbosch | WUSTL | TBD |
| L. Michalsky | Bogdan | WUSTL | 2019 |

**Teaching**

***Workshops***

Washington University in St. Louis

* Summer 2018 Interface of Psychology, Neuroscience, and Genetics Workshop

Teaching Assistant for Drs. Arpana Agrawal and Ryan Bogdan

***Graduate Courses***

Washington University in St. Louis

* Fall 2018 - current GEMS 5483 - Human Genetic Analysis

Co-Instructor

University of Colorado Boulder

* Fall 2016 PSYC 5541 - Special Topics: R Programming Course

Co-Teaching Assistant for Dr. Matthew Keller

***Undergraduate Courses***

Washington University in St. Louis

* Fall 2019 - current PSYC 345 - Genes, Environment, and Human Behavior

Instructor

University of Colorado Boulder

* Spring 2014 PSYC 2606 - Social Psychology

Teaching Assistant for Dr. Brett King

* Fall 2013 PSYC 3101 - Statistics and Research Methods in Psychology

Teaching Assistant for Dr. Matthew Jones; taught two lab sections

**Professional Development**

Mar. 2023 *The 2023 International Workshop on Statistical Genetic Methods for Human Complex Traits*

Institute for Behavioral Genetics, Boulder, CO

May 2019 *NIDA Addiction Genetics and Epigenetics “Data Jamboree”*

Oak Ridge National Laboratory

Mar. 2015 *The 2015 International Workshop on Statistical Genetic Methods for Human Complex Traits*

Institute for Behavioral Genetics, Boulder, CO

Aug. 2012 SAS Clinical Trials Programmer Certification

May 2012-Aug. 2012 Summer Programming Intern, Biogen Idec, Inc.

Research Triangle Park, North Carolina

*Mentor*: Christopher Kania, M.A.

**Editorial Responsibilities**

***Editorial Boards***

|  |  |
| --- | --- |
| 2020 – *present* | Editorial board member, *Complex Psychiatry* |

***Ad-Hoc Reviewer***

* *Addiction*
* *Addictive Behaviors*
* *Alcoholism: Clinical and Experimental Research*
* *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*
* *American Journal of Psychiatry*
* *Behavior Genetics*
* *Biological Psychiatry*
* *BMC Psychiatry*
* *Cell*
* *Drug and Alcohol Dependence*
* *Frontiers: Neurology*
* *Genes, Brain, and Behavior*
* *Human Molecular Genetics*
* *Journal of Abnormal Psychology*
* *Journal of Child Psychology and Psychiatry*
* *Molecular Psychiatry*
* *Nature Communications*
* *Psychological Medicine*
* *Schizophrenia Bulletin*
* *Suicide and Life-Threatening Behavior*
* *Translational Psychiatry*

**Service**

***Professional Societies and Organizations***

|  |  |
| --- | --- |
| 2021 – 2023 | Memberof the Behavioral Genetics Association IDEA (Inclusion, Diversity, Equity, and Access) Task Force |
| 2021 | Memberof the PGC Day planning committee for the 2021 World Congress on Psychiatric Genetics |
| 2020 – 2022 | Memberof the NIDA Consortium on Addiction Data Integration Working Group |
| 2019 - *present* | Representative for the PGC SUD, PGC Data Receiving Committee |
| 2018 – *present* | Member of the Research Society on Alcoholism |
| 2016 – *present* | Member of the American Society of Human Genetics |
| 2016 – *present* | Member of the Behavioral Genetics Association |
| 2016 | Member, IBG Annual Mini-Conference coordinating committee |

**References**

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Howard Edenberg, Ph.D. (*PGC SUD co-chair*)

Professor

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Medical Science, Room 4063E

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