ADAI Small Grants (Marijuana) FY2018 - FY2019
Funded by Marijuana Dedicated Funds for Research at the Univ. of Washington

Defining Safe Cannabis Use in a Legal Context: A Market Perspective

PI: Michele Cadigan, PhD Student, NSF Graduate Research Fellow, Sociology

This study investigates legal cannabis retail store (i.e. pot shop) workers' definitions of safe use and the potential role these workers play in shaping broader customer definitions of safe consumption across a range of products in the absence of readily available scientific definitions. Moreover, this study seeks to identify themes around cannabis use and definitions of cannabis abuse in order to create a cannabis industry employee survey. The proposed research asks for funding to interview sixty interview respondents including pot shop staff and customers, which will be used to construct and pilot a survey that will become the first statewide cannabis industry worker survey.

Resulting publications, presentations, and grants

- I am applying for additional funds to administer my survey instrument to cannabis industry workers in Washington State.
- Cadigan M. Defining Safe Cannabis Consumption within the Retail Space. Oral presentation at North American Cannabis Summit, Los Angeles. January 2019
- Cadigan M, Harris A. Deserving Cannabis Entrepreneurs: How the State and Workers Define Who Gets to Be Legal. Oral presentation in seminar "Contested Markets: Lessons from Cannabis Legalization," HEC Paris, June 2018

Exploring the Potential of "Budtenders" as Harm Reduction Agents: A Study among Cannabis Retail Workers in Washington State.

PI: Beatriz H. Carlini, PhD, MPH, Senior Research Scientist, Alcohol and Drug Abuse Institute

This project will explore the potential for cannabis retail staff (budtenders) in Washington to educate their customers on practical strategies aimed at reducing negative consequences associated with cannabis use. A harm reduction framework and qualitative methods will be utilized. Results will be used to inform recommendations for developing training resources for this growing and important segment of the cannabis industry workforce. Findings from this exploratory study will also be used to apply for external support to develop, test and conduct research on harm reduction interventions for cannabis users that can be delivered by budtenders.

Resulting publications, presentations, and grants
- Carlini BH. Cannabis Retail Workers: Exploring the Potential of Marijuana Retail Staff ("budtenders") as Harm Reduction Agents. Oral presentation at Research Society on Marijuana, 3rd Annual Scientific Meeting, Vancouver WA, July 2019.
- The results of this study will be used for external grant application aimed at developing and testing public health education for budtenders.

Piloting of a Synthetic Control Approach for Assessing Impact of Changes in State Marijuana Policy on Adolescent Substance Use and Related Behaviors

PI: Katarina Guttmannnova, PhD, Psychiatry & Behavioral Sciences
Co-I: Charles B. Fleming, MA. Psychiatry & Behavioral Sciences

This project will capitalize on existing nationwide state-level data to examine whether state-level marijuana policies affect marijuana and other drug use by youth and related negative consequences of use such as mental health problems and violence. Existing evidence regarding the effects of marijuana policies on adolescent outcomes remains mixed. The study will pilot an innovative analytic technique, synthetic control modeling (SCM), to compare trends in adolescent outcomes from an early adopting medical marijuana law state with a weighted counterfactual based on data from states that that did not pass such policy but are similar in pre-policy levels of relevant covariates and outcomes. This work will provide critical information to guide planning of prevention and intervention efforts aimed at reducing adolescent problem behaviors in the changing marijuana policy context. It will also increase the research team's competitiveness for obtaining funding to more widely apply the synthetic control approach to evaluating the effects of marijuana policy.

Resulting publications, presentations, and grants:
- Guttmannova K et al. Using existing data to advance knowledge about adolescent and emerging adult marijuana use in the context of changes in marijuana policies. Prevention Science 2019;20(2):291-299.
- Pilot data from this grant will be used in a resubmission of an ROI to NIDA in Fall, 2019.

Brain and Behavioral Correlates of Prenatal Marijuana Exposure

PI: Natalia Kleinhans, PhD, Associate Professor, Radiology
Co-I: Stephen Dager, MD, Professor Radiology & Assoc. Director, Center on Human Development and Disability

Cannabis use during pregnancy has increased substantially, changing public perceptions about harm, and evidence of cannabis's antiemetic properties. Prior outcomes research on prenatal marijuana exposure is narrow in scope and may have limited relevance to medicinal users, as these older studies included research participants with polysubstance use (e.g. tobacco, alcohol, illicit drugs). In addition, prior research likely underestimated potential risks of cannabis use during pregnancy because modern strains are 3 times more potent than they were 30 years ago. We will study brain development in infants exposed *in utero* to cannabis using state-of-the-art MRI and comprehensive questionnaires validated in our studies of infants at high-risk for developing autism spectrum disorder. By focusing on infancy, we aim to characterize cannabis-induced brain and behavioral changes while minimizing environmental effects that contribute to outcomes at older ages.

Resulting publications, presentations, and grants:
- This small grant was helpful towards a successful application for a NIDA grant, "Olfactory Activation and Brain Development in Infants with Prenatal Cannabis Exposure." 1R21DA046696-01A1, Feb. 1, 2019-Jan. 31, 2021.
- "Moms + Marijuana" project (funded by NIDA grant above)

Do Edible Cannabinoids Prevent Morphine Tolerance in a Mouse Neuropathic Pain Model?

PI: Benjamin Land, PhD, Research Assistant Professor, Pharmacology

Chronic pain affects over 100 million people in the United States. Alternative medications for chronic pain are needed, and the cannabinoids THC and cannabidiol (CBD) are promising candidates for analgesia. There is also evidence that cannabinoids and opioids can work synergistically, lowering the dose of opioid required for analgesia, and thus reducing tolerance and reward. However, it is unknown whether the opioid-sparing effects of cannabinoids lasts over long periods of administration, a requirement for chronic pain. In this study, we will employ our well-established gelatin self-administration model in mice to determine if mixtures of morphine and THC or CBD can produce long-lasting analgesia in a chronic neuropathic model of pain. Consumption patterns will be recorded, as well as pain scores for allodynia and hyperalgesia. We have shown that consumption of morphine alone produces analgesic tolerance after 7 days of treatment, and we predict that addition of CBD or THC will prevent or prolong this tolerance. Finally, we will use 2-gelatin choice procedure to determine if CBD or THC can prevent the rewarding effects of morphine.

Resulting publications, presentations, and grants:
- Data from this grant was used in an R01 focused on pain and cannabinoid mixtures, submitted in 2019. While it was not funded in the first round, it will be resubmitted.
- Leung EJY, Abraham AD, Wong BA, Kruse LC, Clark JJ, Land BB. Orally consumed cannabinoids provide long-lasting relief of allodynia in a mouse model of chronic neuropathic pain. Neuropsychopharmacology (in revision, 2019).
- This grant allowed our group to expand our pain measurement resources, so that other groups on campus can now take advantage of our pain equipment. Since the grant, the Stuber, Dhaka, and Zweifel labs have used our pain equipment, and it continues to generate interest in pain research at the UW.

Relationship between Cannabis Use and Persisting Post-Concussive Symptoms in Veterans with a History of Mild Post-Traumatic Brain Injury

PI: Kathleen Pagulayan, PhD, Assistant Professor, Psychiatry & Behavioral Sciences
Co-I: Elaine Peskind, MD, Professor, Psychiatry & Behavioral Sciences; Todd Richards, PhD, Professor, Radiology

Approximately 2.2 million people sustain a traumatic brain injury (TBI) every year, with the vast majority of these injuries classified as "mild". A subset of individuals with a history of mild TBI (mTBI) report persistent symptoms for months or even years post injury. These post-concussive symptoms can have a significant and debilitating impact on day-to-day functioning and quality of life. The risk of experiencing these persisting symptoms increases with repeated mTBIs. Our understanding of the other factors that contribute to or reduce these symptoms remains limited and current treatment options are often inadequate. This study will investigate the relationship between post-injury cannabis use and post-concussive symptom presentation among military veterans with a history of repeated mTBI.

Cannabis Identity as a Cognitive Risk Factor for Young Adult Cannabis Misuse

PI: Jason Ramirez, PhD, Acting Assistant Professor, Psychiatry & Behavioral Sciences
Co-I: Christine Lee, PhD, and Kristen Lindgren, Psychiatry & Behavioral Sciences

Recent theoretical models assert that substance identity, or the extent to which one views substance use as part of their self-concept, is a unique and important cognitive risk factor for substance misuse. Substance-related identities can be measured with explicit (e.g., self-report) and implicit (e.g., reaction time) measures; and both uniquely predict substance misuse. To date, research on cannabis identity is limited as reliable implicit measures have yet to be developed and explicit measures require validation as unique predictors of cannabis misuse. The proposed research aims to develop and test two novel Cannabis Identity Implicit Associations Tests (CI-IATs) to assess implicit cannabis identity. The ultimate goals of this application are to establish whether cannabis identity is a unique cognitive risk factor for cannabis misuse, to advance theory, and to provide pilot data for a future R01 proposal to examine longitudinal relationships between cannabis identity and cannabis misuse among young adults.

Resulting publications, presentations, & grants:
- Pilot data from this project was used in a successful application to NIDA: "Cannabis Identity as Cognitive and Developmental Risk Factors for Adolescent Cannabis Misuse." R21DA045092 and funded Supplement R21DA045092 01A1S1.
- Ramirez JJ, Lee CM, Lindgren KP. Marijuana Identities: Developing and Examining Implicit Association Tests that Measure Associations between Marijuana and the Self among WA State Young Adults. Presentation at the 3rd Annual Scientific Meeting of the Research Society on Marijuana, July 2019, Vancouver, WA.
- Ramirez, J. J., Lee, C. M., Wallace, E., & Lindgren, K. P. (2019). The development and validation of the marijuana identity implicit association test. Manuscript in preparation.
- Ramirez, J. J., Lee, C. M., Olin, C. C., Abdallah, D., & Lindgren, K. P. (2019). What's the harm in getting in high? Evaluating implicit associations between marijuana and harm as predictors of concurrent and prospective marijuana use and misuse. Manuscript under review.

- Preliminary findings from the project were presented on November 26, 2018 at the Cannabinoid Journal Club at UW organized by Dr. Benjamin Land (Department of Pharmacology).

I-502 County-Level Voting and Local Adolescent Marijuana Use: Do Risk Factor (Perceived Harm and Availability) Associations and Trends Differ by Grade?

PI: Andrea Stone, PhD, Assistant Professor, Nursing and Health Sciences, UW Bothell

This study will examine the impact of local norms concerning marijuana on use by youth in Washington. Using data from the Washington State Healthy Youth Survey (HYS) on adolescent marijuana use, perception of harm, perception of availability, and student grade (8th, 10th, 12), we will analyze the relationship between these variables and county level voting results for Initiative-502.   We will examine trends from 2002–2016, stratified by county level I-502 voting preference, in relation to marijuana use, the percent of youth reporting perceived easy access to marijuana, and perceived harm/risk from marijuana use. Findings from this study may be used to inform the ongoing national level debate regarding the legal status of marijuana in the United States.

All marijuana grants supported by the WA Dedicated Marijuana Fund: http://bit.ly/SmallGrants-I502