AGS

VIRTUAL SYMPOSIUM 2021
PROGRAM

9 AM – 12 PM

APRIL 24TH, 2021

ZOOM EVENT

PRESENTATIONS AND TALKS

The AGS Symposium showcases the research and accomplishments of all students in the graduate division.
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PRESENTER NAME: FLORENCIO PORTOCARRERO

Title: The Affective and Behavioral Consequences of Employee Participation in Corporate Social Responsibility: Field Experimental Evidence

Abstract: Corporations around the world increasingly implement socially responsible programs and policies. Alas, much of the corporate social responsibility (CSR) literature has been unable to provide causal evidence of the effects of CSR on critical employee outcomes. Using a field experiment as part of the new-employee orientation process of 221 employees in a large bank, this study evaluates whether random assignment and participation in a CSR intervention influence employees’ subsequent participation in corporate volunteering activities seven months after its implementation. Employee participation in CSR is conceptualized as an affective event. Three enduring forms of affect in work-life (organizational pride, organizational gratitude, and workplace empathy) are suggested as direct outcomes of the CSR treatment and as mediators of the effects on subsequent volunteering behavior. Employees randomly assigned to the CSR treatment were more likely to become corporate volunteers and engaged more frequently in subsequent corporate volunteering initiatives than control employees. Compared to control employees, treated employees reported higher levels of organizational pride and workplace empathy, but not of organizational gratitude. This study shows that workplace empathy explains the effects of being assigned to a CSR activity on employees’ subsequent volunteering likelihood and frequency. In contrast, organizational pride only explains part of the impact of CSR on employees’ volunteering frequency. Finally, this study offers contributions to the micro CSR, corporate volunteering, and emotions in organizational life literatures, and provides practitioners actionable recommendations to promote employees’ engagement in corporate volunteering programs.

PRESENTER NAME: XUAN XIE

Title: How Can I Help When I Feel Rejected?

Abstract: "It is our nature to identify ourselves with groups and make judgements about out-groups. Negative consequences of social exclusion include unpleasant outcomes at individual levels (e.g., depression) as well as at society levels (e.g., aggression). Our research, on the contrary, uncovers the importance of social exclusion type and prototypicality in prompting prosocial behavior (e.g., blood donation, clothing drive, and volunteering)."
The present research builds on existing literature by exploring the role of social exclusion type (ignored vs rejected) and its interaction with prototypicality (prototypical vs. peripheral) on prosocial behavior. The question addressed here is when being rejected (ignored), whether peripheral (prototypical) individuals are more (less) likely to engage in prosocial behavior. We predict that prototypical (vs. peripheral) are less likely to engage in prosocial behavior when feeling rejected (vs. ignored).

To test our theorizing, 331 participants recruited online were randomly assigned to a 3 (ignored vs. rejected vs. control) x 2 (peripheral vs. prototypical) ANOVA between-subjects study. Experiment results illuminate that when feeling rejected, prototypical members displayed a lower willingness-to-help whereas peripheral members showcased an increase in their willingness-to-help indicating feeling peripheral prompt the need to strengthening group identifications by increasing their willingness-to-help as a way to signal their integral role of the greater society. However, such effect was attenuated when feeling ignored among both peripheral and prototypical members. This is because rejection dealt more with relational needs while being ignored dealt more with efficacy needs."

**PRESENTER NAME:** KARTHIK PRASAD

**Title:** The Rise of Reddit & Anki: Implications of a Crowdsourced Medical Curriculum

**Abstract:** Founded in 2005, Reddit was billed as an American news aggregation, web content rating, and discussion board. Its goal was to be the “front page of the Intranet.” In 2008, Reddit launched “subreddits”, which were user-moderated community-specific web platforms. In 2014, Dr. Amreet Sidu (AKA “u/brosencephalon”) published the Bros Deck, a monstrous Anki medical school deck with ~16,000 flashcards to the “/r/medicalschool” subreddit. In the following years, Redditors (members of the subreddit) came together, improving on his deck or creating new decks such as “Lightyear”, “lolnotacop”, and “Zanki.” The current crowdsourced preclinical Anki deck (Anking V6) consists of 22,878 flashcards created by 55+ medical students all around the world, deriving content from uWorld, First Aid, and Pathoma as well as primary source material. We performed a Google Trend data analysis from 2008 to 2020 and compared reddit crowdsourced anki decks to traditional 3rd party board prep resources. We found that these reddit Anki community became more popular than traditional resources in mid-2019. These Reddit-born Anki decks offer a decentralized educational model, untethered to local instructional capabilities, and are the defining generational paradigm shift in medical education.
**PRESENTER NAME:** DIANA JOY YANG

**Title:** A Dynamic Factor Approach To Estimate Animal Spirits and Policy Impact On The COVID-19 Stock Market

**Abstract:** This paper investigates animal spirits or latent comovements of the COVID-19 stock market and studies the impact on cross-sector stock returns of a variety of policy announcements including Conventional Monetary Policy, Unconventional Monetary Policy, Fiscal Stimulus, unemployment rate release, and government restrictions. In estimating the latent animal spirits and policy impact, I conduct a dynamic factor model (DFM) and adapt the Markov Chain Monte Carlo (MCMC) estimation method following Chan and Jeliazkov (2009). This study finds that, as of August 31, 2020, the animal spirits have a weak daily oscillation pattern with an autoregressive coefficient of -0.09 in an AR(1) process. Conventional Monetary Policy announcements have positive impacts on non-durable goods and utility stock returns. Unconventional Monetary Policy announcements have a positive impact on high-tech and durable goods sectors. In comparison, Fiscal stimulus has a much larger positive impact on the assets returns in all sectors.

**PRESENTER NAME:** PAULINA SILVA

**Title:** Using Interleaved Practice to Teach Statistics

**Abstract:** Interleaved practice (e.g., shuffling questions of different topics together) is widely accepted as an effective instructional method for learning in a variety of domains (Carvalho & Goldstone, 2014; Richland et al., 2015; Rohrer et al., 2020; Szpiro et al., 2014). It is typically contrasted with blocked practice (e.g., presenting questions of the same topic together). We expanded these findings by testing whether interleaved practice is more effective than blocked practice for learning and applying common statistics concepts using educationally-relevant materials in an online experiment with undergraduate students at an R1 university (n=67, first gen=58%, URM=56%, female=86). Participants completed two phases: a practice phase and a test phase. In the practice phase, they studied three short statistics lessons, then completed a set of questions. Seven days later, participants completed another set of questions about the same topics from the practice phase. Unexpectedly, interleaved practice did not lead to better overall performance, nor did it lead to better performance on either basic recall or applied problems. Separate repeated measures ANOVAs revealed no significant effects of practice type for either simple recall or applied problems. Comparable Bayesian analyses support the conclusion that there was a weak effect to no effect of interleaving. We speculate that interleaved practice may be effective for certain kinds of course content but not others; the overall difficulty of statistics content may necessitate longer practice periods before an effect can be observed.
**PRESENTER NAME: SOCORRO CAMBERO**

**Title:** Social Capital in Higher Education: Informal Institutional Agents and Cultural Brokers

**Abstract:** A frequently invoked explanation for the educational success of students is access to social capital, which is the information, support, and supervision that closely-knit networks provide for students (Stanton Salazar, 1997). Critical Race Theorists challenge traditional deficit-informed notions of social capital (Bourdieu, 1986), wherein access to specific forms of knowledge and skills valued by privileged groups in society can only be inherited through one’s social networks. Instead, Critical Race Scholars consider students’ communities to be the most important source of social capital and have created an empirically informed model called, “Community Cultural Wealth” (Yosso, 2005). This model sheds light to forms of wealth communities of color hold, such as navigational capital, that allows students to pragmatically navigate through systems plagued with inequalities, such as schools. A dearth of scholarship has focused on the specific experiences first-generation college students of color undergo outside of formal educational spaces to garner social capital and how they apply the social capital they acquire when navigating higher education. To fill this gap, my research focuses on exploring the learning experiences outside formal educational spaces that are most salient to first-generation college students and where they apply the social capital acquired through these experiences. This research illuminates overlooked sites of social capital beyond formal educational settings and explores how students employ the social capital acquired as they navigate higher education. Thus, this paper contributes theoretical renderings of social capital through the educational experiences of first-generation college students of color—children of immigrants and other nondominant populations.

**PRESENTER NAME: LANGOU LIAN**

**Title:** Gender Egalitarian Essentialism in the Private Sphere: Links with Gender and Marital Status

**Abstract:** The growing divide in gender ideologies between the public and private spheres suggests the rise of gender-egalitarian essentialism. Using the Chinese General Social Survey from 2010 to 2017, the current study test this ideological framework by examining gender differences in two dimensions of gender beliefs in the private spheres. Specifically, focusing on essentialism in the private family, the analysis compares gender differences in beliefs about the traditional division of labor and views on the intrinsic value of women’s life. Besides, this research looks beyond the socioeconomic explanations and analyzes how marriage experiences moderate gender differences in gender essentialism beliefs. The results show a divergence in gender essential beliefs, and men are more likely to have an inconsistent opinion than women. Men are more likely to oppose the rhetoric that women’s life is defined by marriage, while they still believe that women should prioritize family and men should prioritize work. Also,
considering socioeconomic differences, women’s marriage experiences have a significant and lasting impact on their gender essential beliefs. Such associations are not found for men. This study suggests that divergence also can be observed when examining various dimensions of gender essential beliefs in the family, and it is likely to be explained by divergences in men’s beliefs.

**PRESENTER NAME: CANTON WINER**

**Title:** Forgetting the ‘A:’ Asexual Erasure in the LGBTQIA+ Community

**Abstract:** In recent years, sexual and gender identities have blossomed in the United States, with the LGBTQIA+ alphabet soup growing ever-larger. The proliferation of identity options has, in some ways, made the LGBTQIA+ umbrella community more welcoming than ever. It has also, however, exposed marginalization within the LGBTQIA+ community. This has been particularly true for an identity so often sidelined that it has been called the “invisible identity:” asexuality, which generally refers to those who do not experience sexual attraction. Even in LGBTQIA+ spaces, asexuality is often erased and knowledge of asexuality is low. Many within the community believe, for example, that the ‘A’ in LGBTQIA+ stands for “allies” rather than “asexuality.” Through interviews with asexual individuals, I explore whether asexual people consider themselves to be part of the LGBTQIA+ community and examine their experiences of inclusion/exclusion within that community. Overall, I find that asexual individuals express a great deal of discomfort and uncertainty regarding their place in LGBTQIA+ spaces and communities. I discuss the implications of the marginalization of asexuality within the LGBTQIA+ umbrella and argue that asexuality presents an opportunity to rethink queerness and queer belonging.

**PRESENTER NAME: HALEIGH MARCELLO**

**Title:** Action = Life: The Orange County Visibility League and the HIV/AIDS Crisis

**Abstract:** The Orange County Visibility League (OCVL), founded in 1987, was one of Orange County’s most active gay rights organizations. Drawing inspiration from radical gay activist groups like ACT UP, OCVL campaigned for antidiscrimination legislation and against political leaders who sought to undermine the gay rights movement. This paper seeks to understand the strategies used by OCVL in their protest against the lack of antidiscrimination legislation in Orange County during 1989. In doing so, I explore the connections between OCVL and the larger, nationwide gay rights movement; examine how OCVL differed and was similar to ACT UP; and seek to understand where else OCVL drew inspiration from, including the civil rights movement. In doing so, I argue for the importance of examining suburban gay activism. Largely ignored by other scholars, gay activism in suburban areas not only existed, but had a key role to play within the larger, nationwide gay rights movement.
**PRESENTER NAME:** MENG ZHAO

**Title:** Ecological restoration impact on total terrestrial water storage.

**Abstract:** Large-scale ecological restoration (ER) has been successful in curbing land degradation and improving ecosystem services. Previous studies have shown that ER changes individual water flux or storage, but its net impact on total water resources remains unknown. Here we quantify ER impact on total terrestrial water storage (TWS) in the Mu Us Sandyland of northern China, a hotspot of ER practices. By integrating multiple satellite observations and government reports, we construct a TWS record that covers both the pre-ER (1982–1998) and the post-ER (2003–2016) periods. We observe a significant TWS depletion ($P < 0.0001$) after ER, a substantial deviation from the pre-ER condition. This contrasts with a TWS increase simulated by an ecosystem model that excludes human interventions, indicating that ER is the primary cause for the observed water depletion. We estimate that ER has consumed TWS at an average rate of $16.6 \pm 5.0$ mm yr$^{-1}$ in the analysed domain, equivalent to a volume of 21 km$^3$ freshwater loss during the post-ER period. This study provides a framework that directly informs the water cost of ER. Our findings show that ER can exert excessive pressure on regional water resources. Sustainable ER strategies require optimizing ecosystem water consumption to balance land restoration and water resource conservation.

**PRESENTER NAME:** TONY LI

**Title:** Garden cities of today.

**Abstract:** My presentation will be about using various existing urban planning techniques to build more equitable and sustainable cities. Communities in disadvantaged areas could form community land trusts to capture the growing value of land. They could then use transit oriented development to add value to the land. My presentation will discuss the ways of mobilizing communities to create new and more beneficial economic relationships. It will be related to the new green deal and black lives matter.

**PRESENTER NAME:** ROBERT FOFRICH

**Title:** Agricultural migration to avoid future climate change

**Abstract:** Over the next century, climate change is projected to have mixed impacts on global agricultural production, benefiting crops in historically cooler regions while making ambient conditions unsuitable for their cultivation in already warmer regions. The stability and efficiency of future food production may thus be strongly affected by climate change, and the shocks to agricultural markets will largely depend on the degree of climate warming in key cultivated regions. We investigate spatial shifts of the climate envelopes for four major cereal crops (maize, rice, soybean, and wheat) and identify the nearest areas with a future analogous climate under
various climate change scenarios. Additionally, we quantify the climate migration rates in cropland regions, and calculate the proportion of harvest that is disrupted by climate change at a regional and global scale.

**ROOM 4: PRE AND POST NATAL**

**PRESENTER NAME:** SADAF SARAFAN

**Title:** Development of a Home-based fetal ECG monitoring system

**Abstract:** The current global COVID-19 pandemic has led to critical public health, social, and economic issues, revealing the weaknesses of our healthcare system. In recent years, home-based devices for fetal monitoring have been introduced. These include Doppler-ultrasound fetal heart rate (fHR) monitors which require active scanning over the abdomen using gel to locate the fetal heart. The measurement is especially challenging for non-medical persons. Further, it provides only fHR, which cannot be used to monitor abnormal development of the heart, in contrast to fetal ECG (fECG), which depicts PQRST features in the signal that showing the functional conditions of the heart.

My proposal aims to develop and validate advanced algorithms to enable home-based monitoring of the fetus and mom which would revolutionize the way we are providing prenatal care. Here are my two specific aims:

Aim 1: Develop fHR extraction via a single-channel abdominal ECG (aECG) in the daily life. We will develop novel schemes to extract fHR with the presence of high noise.

Aim 2: Develop fECG extraction with PQRST waves for diagnosis. We will study and validate algorithms to extract full-feature fECG in the clinics with multiple-channel abdominal ECG and at home with additional maternal heart rate (mHR) as the reference signal provided by a smartwatch.

My proposed system would take the burgeoning field of telemedicine and mobile health (m-Health) to the next level. Successful completion of this project will provide a foundation to improve the infrastructure for providing remote monitoring to patients and care teams.
**PRESENTER NAME:** POONAM AHUJA

**Title:** Prediction of Post-Partum Hemorrhage (PPH): Using Machine Learning (ML) to identify patients at risk

**Abstract:** PPH is one of the largest causes of maternal morbidity and mortality worldwide and USA. By predicting mothers at risk for PPH, prophylactic measures can help avoid maternal morbidity and mortality.

Objective: To utilize ML techniques to identify patients at risk for PPH. Study Design: We will do analysis of retrospective data of women delivering in a particular period. Collect all variables from the medical records. The outcome would be PPH, defined as a blood loss of ≥ 1000 mL at the time of delivery. Adopt supervised learning with regression, tree and kernel-based ML methods to create classification models based upon training and testing sets. Models will be tuned to get overall better accuracy and sensitivity.

Results: Currently due to lack of access to patient data, considering PHI* policy, I do not have direct results of my own analysis. While doing secondary research analysis, found very few studies on this. Taking cues, I plan to validate the same and explore the scalability of this globally.

Conclusion: PPH can be predicted using ML. Further application may assist doctors to be prepared and triage at-risk women. *protected health information.

**PRESENTER NAME:** YACHEN ZHU

**Title:** Approximate Bayesian Calibration of Historical PFOA Exposure

**Abstract:** Environmental epidemiologists usually use exposure biomarkers such as serum PFAS concentrations as individual exposure assignments in epidemiologic analyses of toxicant exposure. In those settings, it is common to obtain only one biological sample per person and use that biomarker measurement to represent each individual’s cumulative exposure at the time of health outcome, even though most exposure biomarkers fluctuate over time. These biomarker measurements are often temporally misaligned with the health outcomes, creating exposure measurement error that induces bias in the health effect estimates. In this project, we developed and implemented a Bayesian framework to calibrate the annual PFOA historical exposure assignments for the C8 Health Project participants, combining residential “contact-based” exposure assignments with the measured serum concentrations using “pharmacokinetic calibration”. We used a hierarchical model with multivariate lognormal distributed priors for shared exposure sources. We also applied lognormally distributed pharmacokinetic parameters to account for subject-specific random effects. We analyzed the association between PFOA and preeclampsia in the C8 Health Project based on the improved exposure estimates.
**PRESENTER NAME:** LINDSEY SOLES

**Title:** Pumilio Proteins are Novel Activators of HOX Genes

**Abstract:** Pumilio proteins (Pum1/2) are highly conserved, sequence-specific RNA binding proteins that regulate stem cell differentiation and embryonic development in mammals. Neural-specific depletion of Pum1/2 in mice leads to defects in neurogenesis and partial loss of Pum1 in humans leads to neurological disease. It has been proposed that the dramatic neuronal defects following Pum1/2 depletion largely result from loss of Pum1/2’s canonical function as translational repressors. However, Pumilio proteins across several species, including humans, can activate specific targets through unknown mechanisms. Strikingly, we recently identified several novel targets of Pum1/2-dependent activation within the HOX gene family—a family of proteins that, like Pum1/2, are essential for proper embryonic development and stem cell differentiation. Of the 39 human HOX genes, we found 6 to be significantly downregulated following Pum1/2 depletion in human cells. Further, using iCLIP-seq we found that the 3’ untranslated region (3’UTR) of 25 HOX genes is bound by Pum1. Importantly, Pum1 binds the 3’UTR of all 6 HOX genes that were significantly downregulated following Pum1/2 depletion. In fact, we found that the 3’UTR sequence of HOX genes is sufficient to increase expression of a reporter mRNA. Finally, Pum1/2 and the Pumilio binding element within the 3’UTR are both necessary for increased expression of a reporter mRNA. Pum1/2 and HOX genes are indispensable regulators of neural differentiation and our data suggests Pum1/2 may bolster expression of several HOX genes. If true, this may provide insights into how partial loss of Pum1 in humans leads to neurological disease.

**ROOM 5: REFLECTINS, FLUORESCENCE, BRAIN SIGNALS**

**PRESENTER NAME:** PREETA PRATAKSHYA

**Title:** Structure, Assembly and Properties of a Cephalopod Protein-Based Material

**Abstract:** Cephalopods are known for their remarkable ability to camouflage by rapidly changing the color and reflectance of their skin, a property that is enabled by the presence of subcellular structures composed of unique structural proteins called reflectins. Given the critical role played by reflectins in regulating the optical behavior of these organisms, and their technological potential for the development of biophotonic and bioelectronic devices, these proteins have recently emerged as a desirable target for the design of novel functional biomaterials. However, the development of such materials has been impeded by a lack of complete understanding of their structures and properties. Here we highlight the proteins’ structure, assembly and multi-faceted material properties within the context of biophotonic and bioelectronic platforms. Specifically, we present the molecular-level structure of a model cephalopod protein and discuss how its structure and stimuli-responsive assembly enables its optical and electrical functionality. Our findings not only provide useful insights into the structure-
function relationships of reflectins but also underscore their potential as functional biomaterials and hold relevance for the development of cephalopod-inspired optical and electronic technologies.

**PRESENTER NAME: ANNA GONZALEZ ROSELL**

**Title:** Sequence-encoded nanophotonics: DNA-stabilized silver nanoclusters as tunable fluorescent nanomaterials

**Abstract:** Near-infrared (NIR) light penetrates much farther into biological tissues than visible light, up to several centimeters in some cases. For this reason, NIR fluorescence microscopy could allow noninvasive imaging deep into tissues and even whole organisms. However, deep tissue imaging has been hindered by a lack of small, bright, non-toxic biolabels which emit NIR light. DNA-templated silver nanoclusters (Ag-DNAs) are novel fluorescent nanomaterials which are highly tunable and promising candidates for bioimaging applications. Ag-DNAs are tiny clusters of only 10-30 silver atoms encapsulated within short DNA oligonucleotides. Ag-DNAs are unique among fluorophores for their “genomic” properties: DNA sequence encodes the size and fluorescence color of an Ag-DNA, enabling tunability of Ag-DNA fluorescence colors across a wide spectral range from 500 nm up to 1000 nm, for which biological tissues are especially transparent. By combining custom machine learning models with high-throughput experiments, we aim to better understand the cluster structure and the role of nucleobase positions and patterns along the DNA sequence and to rationally design new brightly fluorescent clusters and extend the fluorescence color palette further into the NIR region, optimizing both chemical and optical properties to obtain stable, biocompatible fluorophores.

**PRESENTER NAME: PINCHUN CHEN**

**Title:** The sleeping brain switches between frontal-subcortical working memory to hippocampal episodic memory processing during NREM sleep.

**Abstract:** Non-rapid-eye-movement (NREM) sleep is beneficial for both working memory (WM) and long-term memory (LTM). Recent discoveries suggest the intriguing possibility that LTM consolidation relies on central sigma activity, whereas WM improvement relies on autonomic vagal processes. However, it remains unclear whether these two mechanisms are independent, synergistic, or counteracting. In addition, experimental evidence supporting the causal role of vagal activities on sleep-dependent cognitive function remains lacking. Here, we used two experiments, in a double-blind, placebo-controlled, within-subject design, to pharmacologically investigate the role of autonomic and central activity on sleep-dependent LTM and WM improvement. We exploited zolpidem to boost sigma activity and observed a decrease in vagal activity. Using effective connectivity, we found that central sigma activity exerted greater causal influence on autonomic tone, and such influence can be enhanced by zolpidem. We then showed the functional roles of causal information flow on the behavioral trade-off between LTM and WM. These findings indicate that NREM sleep toggles between
spindle-dependent and vagal-dependent processes, supporting time for the enhancement of both LTM and WM during sleep via separate mechanisms.

**Presenter Name:** YOU (LILY) CHENG

**Title:** The Emergence of Head Direction Signals in Human Navigation

**Abstract:** Head direction is crucial in human wayfinding, but whether head direction signals can be classified in the brain in a complex environment, and how this signal relates to navigation performance remain open questions. In an fMRI study, we tested over 90 participants in a cardinal-direction-aligned virtual maze. The navigation task consisted of an exploration and a test phase. During the 16-minute exploration, participants freely explored to find 9 objects located in the environment and were instructed to remember their locations. For each of the 48 test trials, participants started at one object and were directed to go to another object, without feedback and with a limited time. We conducted an intra-subject multivariate pattern classification for the four head directions in four a priori regions of interest (ROIs). Our preliminary results suggest that during exploration phase, we can successfully discriminate between head directions in retrosplenial cortex, extrastriate cortex, precuneus, and thalamus. For some regions, head direction signals could only be classified successfully during the test phase, whereas others could discriminate during both exploration and test phases. Furthermore, we did not observe a significant relationship between an individual’s classification strength and their subsequent navigation performance. Although in some regions we observed that better performance in discriminating directions was related to better navigation performance, in other regions classifier strength was related to worse navigation performance. This study indicates that the basic navigational signal of head direction is important for successful navigation in a complex environment and could form the basis of individual abilities.

**Room 6: Bio and Physics**

**Presenter Name:** JESSICA SANCHEZ

**Title:** Investigating the role of killer T cells in Alzheimer's Disease Pathogenesis

**Abstract:** The innate immune system, particularly microglia, have been strongly implicated in Alzheimer’s disease pathogenesis. In contrast the role of adaptive immunity in AD remains poorly understood still. To investigate the impact of adaptive immunity on AD pathogenesis, our lab has generated two complementary transgenic models of AD. First, we backcrossed the well-established 5xfAD model onto a Rag2/Il2rg double knockout background (RAG2γc-/-5xfAD). To investigate the specific role of T cells I performed adoptive transfer experiments including bone marrow transplantation and isolated T cell transfers into RAG2γc-/-5xfAD and RAG2γc-/- mice. Immunohistochemistry and flow cytometry have revealed a significant increase in CD3+
CD4+ Helper T cells and an even greater increase in memory CD3+ CD8+ Killer T cells within the RAG2γc-/− 5xfAD brain parenchyma. Interestingly, T cells were sometimes observed adjacent to plaque-associated microglia in the RAG2γc-/− 5xfAD brain. I also used Imaris quantification software to further investigate the T cells seen in RAG2γc-/− mice brains, which concluded that those adaptive immune cells are circulating through the choroid plexus/ventricles of the brain as opposed to the RAG2γc-/− 5xfAD brains where the T cells are actually infiltrating the parenchyma as a response to the AD pathology. Given the robust infiltration of Killer T cells observed in bone marrow transplanted RAG2γc-/− 5xfAD mice, I have also sought to determine whether a similar effect can be observed within immune intact AD mice. Using a bigenic model of AD and flow cytometry, I have indeed confirmed that Killer T cell infiltration is dramatically increased in immune intact AD mice. I’ve also shown with preliminary data that there is some possible correlation of Killer T cells and neuronal cell death in these immune intact mice. Building upon my initial results my remaining studies seek to test the overarching hypothesis that Killer T cells induce both protective and detrimental responses within the AD brain. Specifically, I hypothesize that Killer T cells directly interact with microglia to modulate their activity and decrease beta-amyloid, but conversely also contribute to neuronal death in AD.

**PRESENTER NAME:** KARISSA MUNOZ

**Title:** H89 As A Novel Small Molecule Inhibitor of Chlamydia Infection

**Abstract:** Chlamydia is an obligate intracellular bacterium and the most reported cause of human infection in the U.S. The pathogen proliferates within a eukaryotic host cell, where it resides within a membrane-bound vacuole called the chlamydial inclusion. Chlamydia undergo a unique developmental cycle, where they convert between a replicating form, the reticulate body (RB), and an infectious form, the elementary body (EB). We found that a small molecule, H89, slowed inclusion growth and decreased RB replication by 2-fold, while having a stronger 25-fold reduction in infectious EBs. These effects were not caused by the induction of chlamydial persistence, which is an altered growth state. We mainly attributed the effect on EB production to a defect in RB-to-EB conversion. Typically, H89 is used as an inhibitor of specific protein kinases and vesicular transport to and from the Golgi; however, H89 did not cause these anti-chlamydial effects by blocking the activity of protein kinases PKA or PKC, or by inhibiting protein or lipid transport. So far, no other studies have identified a pharmacological inhibitor that specifically interrupts RB-to-EB conversion without causing chlamydial persistence. This makes H89 a useful tool for the discovery of novel anti-chlamydial therapeutics.
**PRESENTER NAME: ANDREW BARABAS**

**Title:** 2D Sliding Nano-Generator

**Abstract:** Solid state physics is the study of material properties of solids, and a recent addition to this field studies newly discovered sub-branch of van der Waals (vdW) materials. These are made up of layers weakly bound together by van der Waals forces, and as a result of this weak interlayer binding, they can be easily peeled apart to isolate atomically thin monolayers.

Monolayers of different vdW materials can then be stacked together to make layered heterostructures, which themselves can exhibit new material properties, more than just the sum of their parts. One such example is the recent discovery of superconductivity in a structure made of materials which are not superconducting individually.

In this and other examples, the material properties can even change due to relative rotation between the layers.

Our project focuses on dynamic properties predicted to arise from relative motion between one layer of graphene, a semi-metal, and rotationally aligned hexagonal Boron Nitride (BN), an insulator. This combination is insulating, but when the layers slide relative to each other theory predicts that charge will be pumped from one end of the heterostructure to another, generating an electric current. Such a result will be the first dynamic measurement of its kind, opening the door to dynamic studies of more exotic materials combinations, and will be a confirmation of the physical theories we have to describe vdW materials.

**PRESENTER NAME: ANDREA ROHRBACHER**

**Title:** Insights into wildfire influenced air samples using ground-based and satellite measurements

**Abstract:** Ozone (O3) exceedances can be strongly affected by control of precursor emissions of oxides of nitrogen (NOx) and volatile organic compounds (VOCs). O3 production efficiencies (OPE), however, vary spatially and temporally as they are extremely sensitive to changes in these emissions in different chemical regimes designated by the VOC to NOx ratio.

These regimes can shift seasonally as well as during wildfires, which are increasing in occurrence and severity. But wildfire-influenced air samples can be difficult to identify in a statistical manner, particularly in cases of distant or small wildfires due to residual downstream air flows.

Currently, the California San Joaquin Valley (SJV) and South Coast Air Basins (SoCAB) continue to exceed the National Ambient Air Quality Standards (NAAQS) for O3. Identifying wildfire-influenced days while simultaneously observing changes in VOC/NOx chemical regimes and O3 exceedances will clarify dominant O3 formation mechanisms.
temporally and spatially and offer clarity for precursor emission policy goals in these wildfire-influenced areas.

We developed a statistical method for identifying wildfire-influenced days based on ground-based coarse particulate matter (PM10), fine particulate matter (PM2.5), and carbon monoxide (CO) levels. We used the data from TROPOspheric Monitoring Instrument (TROPOMI) on-board the Sentinel-5 Precursor (S5P) satellite to identify HCHO/NO2 ratios and ground-based O3 monitor data across 2018-2020. We also included meteorological data such as temperature, humidity, precipitation, and wind speed. These results give new insight into O3 exceedances that are due to the effect of wildfires.

PRESENTER NAME: ERNESTO BARRAZA-VALDEZ

Title: Laser Electron Acceleration in Micrometers for Medical Applications

Abstract: Laser wakefield acceleration in plasma has compactified accelerators by a few orders of magnitude. By introducing carbon nanotubes (CNT) in place of plasma, we further drastically compress them. The CNT introduction also eliminates the need for vacuum so that this acceleration scheme may be employed in minimally-invasive medical procedures such as endoscopy treatments. In this work we demonstrate laser acceleration relevant to such applications (some 100 keV electrons that can traverse mm into a patient’s tissue, for example). We show an example of this regime of operation with one particular geometry: cylindrical alignment of radially pointed CNTs driven by modest intensity short pulsed lasers going through this cylindrical aperture. We take advantage of the CNT’s high electrical conductivity and great electron excursion to adequately utilize the laser’s ponderomotive force for acceleration. PIC computational results will be shown.

ROOM 7: MEDICINE

PRESENTER NAME: TIFFANY LUU

Title: Emergency Room Physicians Sentiment on Naloxone Prescription

Abstract: Introduction: Deaths from opioid overdoses have reached all-time highs in recent years. There has been considerable effort placed on decreasing deaths from opioid overdose through the prescription and administration of naloxone, which reverses opioid overdose through competitive inhibition at the mu opioid receptor. As a primary point of contact in the healthcare system for many opiate dependent patients, EDs have the potential to prescribe naloxone as part of this effort. Differences in philosophical beliefs, support, education and training as well as resource availability all have been shown to influence physicians’ decisions to prescribe naloxone. To further
examine the attitudes which affect physicians in the prescription of naloxone, we created a survey to better understand the factors influencing ED naloxone prescription.

Methods: We investigated Emergency Physician attitudes regarding the prescription of naloxone to 44 ED physicians working at both community and academic medical centers. To recruit participants, we distributed surveys during emergency medicine conferences in 2019.

Result: Physicians who frequently prescribe naloxone all agreed that they are more likely to prescribe to those already receiving outpatient management care (100%). The majority of those who disagree with the statement (71.4%) never prescribe naloxone. The difference in proportion was statistically significant (p < 0.005). There is an association between frequency of prescription and those who strongly agree that naloxone is safe (87.5%) versus those who never prescribe naloxone (58.8%).

Discussion: Our analysis shows that physicians who regularly prescribe Narcan were much more likely to prescribe patients already in an outpatient pain management group. Physicians have an overall positive view towards Narcan prescription. The majority believed that it could prevent death from overdose and is not a waste of healthcare resources, but their prescription frequency is low.

PRESENTER NAME: RACHAEL HOKENSON

Title: Blocking Estrogen Protects Female and Male Mice from the Memory-Impairing Effects of Multiple Acute Concurrent Stresses

Abstract: Multiple acute concurrent stresses (MAS) in adult male mice impair spatial memory and reduce thin dendritic spines within dorsal CA1 of the hippocampus, while a single stressor of the same short duration does not. We found that in adult female C57BL6J mice, MAS impair object location memory and reduce thin spines only when the mouse is in early proestrus, an estrous cycle stage characterized by high systemic and hippocampal estrogen. By contrast, memory and dendritic spines of females with lower estrogen are spared following MAS. Evidence suggests that while male mice have low systemic estrogen, hippocampal levels are high. We have begun investigating the potential causal role of estrogen in MAS-induced memory impairment in female and male mice. Estrogen is produced by the aromatase-mediated conversion of testosterone to estrogen. Female and male mice were given systemic administrations of the aromatase inhibitor, formestane, which should inhibit both peripheral and neural production of estrogen, for one week leading up to stress. Pretreatment with formestane prevented the induction of memory deficits compared to vehicle treated stressed males or high estrogen females. Additionally, blocking activation of estrogen receptors (ER) with ERα or ERβ antagonists 90 minutes prior to stress similarly protects female and male mice. Studies are underway to 1) measure hippocampal estrogen and determine the effects of aromatase inhibitors and 2) expand these findings to hippocampus specific manipulations.
**PRESENTER NAME: LAUREN URBAN**

**Title:** Activation of a bacterial flow sensor by stimulated neutrophils

**Abstract:** Infectious diseases are the fourth leading cause of death worldwide and result in over 2.5 million deaths annually. During infections, signals in the host environment may activate bacterial responses which promote survival and colonization of human tissues. The cellular components present in host conditions that activate bacterial signaling pathways are not well-characterized. We investigated whether the newly discovered flow-regulated operon (fro) in Pseudomonas aeruginosa is activated by host immune cells. To quantify fro expression, we used a P. aeruginosa strain that co-expresses the yellow fluorescent protein (YFP) under the transcriptional control of the fro promoter and mCherry under the control of a constitutive promoter. We found the unexpected discovery that fro is activated by neutrophils which are in a heightened, inflammatory state and are more effective at killing bacteria. During infections, neutrophils are activated by the presence of bacteria and in this activated state, neutrophils produce high levels of hypochlorous acid (HOCl), a highly potent antimicrobial oxidant. Interestingly, we found that fro activation contributes to the upregulation of antioxidant enzymes in bacteria which mitigate the toxic effects of HOCl. Together the observation that fro activation is finely-tuned to sublethal concentrations of HOCl and induces antioxidant gene expression suggests fro activation may benefit bacterial survival during infections. Our results demonstrate a novel role for fro as a host-sensitive signaling response in P. aeruginosa that is activated by neutrophil activation and could be a novel, targetable pathway for treating P. aeruginosa infections.

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**BREAKOUT ROOM SESSION 2**

**ROOM 1: LAW AND ORDER**

**PRESENTER NAME: JORDAN GRASSO**

**Title:** “Life-Saving” or Deadly: An Analysis of Militarization and Weaponization in California Police Departments

**Abstract:** This study analyzes the relationship between police use of force and militarization. I am particularly interested in examining the connection between material militarization – defined as the proliferation of military weapons and weapon accessories – in California police departments and police violence. Since 1997, local, county, state, and university law enforcement agencies across the country have acquired free military equipment ranging from ready-to-eat meals, dumbbells, generators, and snowsuits to military rifles, high-caliber ammunition, armored vehicles, bayonets, and battering rams directly from the Department of Defense. In 2015, President Barack Obama signed Executive Order 13688, which significantly limited the transfer of weapons and weapon accessories to local police departments. However, in
2017, the Trump administration effectively undid Obama’s executive order, calling the 1033 Program “life-saving.” Jeff Sessions followed by stating that “we will not put superficial concerns above public safety,” thus suggesting that the transfer of equipment such as high-caliber rifles produces more safety for the community and the police. Drawing on data from California police departments and the Federal 1033 Program, I reveal that the weaponization of local police departments drives the relationship between the 1033 Program and the use of force. Specifically, I find that departments that receive more highly valued weapons and weapon accessories are significantly more likely to have higher numbers of lethal force and gun discharge incidents.

**PRESENTER NAME:** XIAOSHUANG IRIS LUO

**Title:** Reciprocal Relationship between Parole and Crime Rates: A Longitudinal Study of Neighborhoods and Reentry

**Abstract:** A large body of literature documents that there is a marked increase in incarceration and people on parole in the United States over the past several decades. Empirical research has yet to sufficiently explore how people on parole returning to communities may affect neighborhood crime rates or how neighborhood crime in turn influences parolees’ integration into communities. Drawing on recent scholarship on mass incarceration, prisoner reentry, and macrolevel predictors of crime, this study examines the reciprocal relationship between returning parolees (by considering the numbers of parolees but also how long parolees stay in the neighborhood) and neighborhood crime rates using a large sample of parolees returning to neighborhoods in the five largest cities (Austin, Dallas, Fort Worth, Houston, and San Antonio) in the state of Texas over a nine-year time period (2003 - 2011). Results show numbers of parolees have significant positive effect on both violent and property crime, but average days of parolees in the neighborhood are significantly associated with reductions in property crime. There is also evidence of moderating effects as parolees with longer stays in high residential stability neighborhoods amplify the reduction of property crime, and long-term parolees are beneficial for disadvantaged neighborhoods. The findings illustrate the need to better understand the dynamics of parolee reentry and neighborhoods in the era of mass incarceration.

**PRESENTER NAME:** PRAMOD KUNJU

**Title:** Eliminating Bias in Criminal Justice
Abstract: Bias in Criminal Justice is a fundamental problem. Using Artificial Intelligence (AI) in Criminal Justice decision making compounds this problem. My talk will dive into potential Biases the use of AI can result in within the domain of Criminal Justice, and the remedies to counter them.

**PRESENTER NAME:** HA EUN KIM

**Title:** Which Schools Disproportionately Refer and Arrest Non-White Students?

**Abstract:** This study focuses on methodological and substantive issues in the characteristics of schools making the greatest contributions to the school-to-prison pipeline (SPP) via high student referral and arrest rates. Relating police presence in schools and other school characteristics to student referrals and arrests, we seek to identify those schools contributing the most to the racial imbalance of the SPP, and how these contributions might be reduced. We address the following research questions:

Which schools in the U.S. have demographics and referral and arrest rates in which it is appropriate to study disproportionate referral and arrest rates?

What is the distribution of race-specific referral and arrest rates for these schools?

Which school characteristics predict higher referral and arrest rates in schools? How do these relationships differ for White, Black and Latinx students?

What is the distribution of race-specific referral and arrest odds ratios in schools, and which school characteristics significantly predict them?

This exploratory study revealed that only about 2% of schools nationally are appropriate to investigate racial disproportionality in student referral and arrest rates. These schools differ markedly from the full population of U.S. schools represented in these data--they are more likely to be high schools, have a police officer present, and have a higher percentage of nonwhite students. We also found that a very small percentage of schools had unusually high referral or arrest rates; these outliers warrant further investigation. Schools with higher percentages of low-income students had higher referral and arrest rates for both Black and White students; thus, a higher percentage of low-income students reduced racial disproportionality in referrals and arrests. Police presence was associated with higher referral and arrest rates for Black students but not related to disproportionality.

**ROOM 2: COVID AND ITS IMPACT**

**PRESENTER NAME:** DANIEL RELIHAN

**Title:** The Politics of Pathogens and Pandemics
Abstract: Understanding population-level variability in responses to pathogens is important for developing effective health-based messages targeted at ideologically diverse populations. Research in political science and psychology suggests that political identities shape how people respond to major threats like climate change, and recent work on responses to the COVID-19 pandemic suggests the same may be true for widespread pathogen outbreaks. What are the conditions under which political identities matter in pathogen responses? To truly test partisan bias, it is necessary to compare responses to pathogens with opposing political implications, as well as non-politicized pathogens. Using two distinct probability-based, nationally representative U.S. samples, we found that pathogen threat responses varied by political orientation: while those identifying with the political right prior to the 2014 Ebola epidemic reported more fear and health-protective behaviors during the epidemic (N = 3,447), those identifying with the political left before the 2020 novel Coronavirus pandemic reported greater fear, risk, and health-protective behaviors during the pandemic (N = 6,514). Importantly, political orientation did not predict perceived riskiness of a familiar, non-politicized pathogen (i.e., the seasonal flu) in either sample. Results suggest that political orientation is an important predictor of how people respond to unfamiliar and deadly pathogens, but not more common non-politicized pathogens. Theoretically, our findings speak to research on the role of political elites in influencing public opinions of major threats, as well as the association between conservatism and pathogen response. Our findings also suggest political orientation be considered when devising public health messages to increase safety compliance.

PRESENTER NAME: JENNY WOO

Title: Supporting students’ resilience during COVID-19: an intervention study

Abstract: The COVID-19 pandemic has caused massive psychological and physical disruptions on a global scale. Already a population prone to depression and anxiety disorders, college students have reported mental health deterioration in response to the epidemic. First-generation students, females, and undergraduates of color were disproportionately impacted. As a result, there is an urgent need to provide accessible interventions to help students build greater emotional resilience. Using a controlled experimental design, the present study investigates the effect of such an intervention on students’ college well-being, emotional intelligence, and coping behaviors during COVID-19. The intervention’s effectiveness during a crisis is evaluated by comparing student outcomes across three time points (winter term 2020 prior to COVID-19 and campus closure; spring term 2020 when closure began and fall term 2020 during closure).

PRESENTER NAME: KAMEKO WASHBURN

Title: COVID-19 Driven Emergency Remote Teaching: Implications for Undergraduate Student Perceptions of Learning, Post-Graduation Preparedness, and Well-Being
Abstract: The COVID-19 pandemic caused rapid shifts from traditional instruction to emergency remote teaching (ERT) as university campuses shut down to protect students, staff, and faculty. This study aimed to examine how these changes impacted undergraduate students’ perceptions of their learning, post-graduation preparedness, and well-being.

Methods: Focus groups were conducted with undergraduate students (n=15) to gain insight into their experiences as they relate to the following research questions: 1. How did the university interactions with students impact perceived responsiveness to the shift to ERT?, 2. Where did students struggle the most with ERT?, How can we adapt our processes to respond to such operational challenges in the future?, 3. What are student concerns for the long-term impact of the shift to ERT and what can we do to mitigate these?, 4. How can feedback from students inform ERT needs in the future? Collected data were analyzed using thematic analysis. Research questions and data analysis were guided by the Context, Input, Process, Product Evaluation Model.

Results: Several themes emerged from the analysis encompassing issues of personal well-being, family and social relationships, learning, university and faculty member support, and professional opportunities. Results indicate that students faced several challenges, some that may have long-term impacts such as reduced preparedness for future careers.

Conclusion: As anthropogenic factors such as climate change and expanding urbanization are expected to increase the rate and severity of disaster events, including infectious outbreaks, these findings can help to inform future institutional strategies and priorities for undergraduate student support initiatives during times of disaster.

PRESENTER NAME: JESUS JASSO VERDUZCO

Title: Mapping Mental Health*: Using GIS as a post-pandemic tool.

Abstract: How can spatial analysis help mental health providers combat a post-pandemic mental health crisis? In this presentation I will discuss statistics and literature that show how an increase in mental health issues are positively correlated with pandemics. For example, during the Middle East Respiratory Syndrome (MERS) outbreak in 2015, 42.9% of survivors reported having PTSD symptoms and 27.0% reported depression symptoms at least 12 months after the outbreak. (Park et. al., 2020) The literature implies that areas with a high Covid-19 death rate may result in a greater mental health crisis for people residing within these geographical areas. As a second component to my presentation, I will display Geographical Information Systems (GIS) maps that visually show the areas within Los Angeles (LA) County that have a high COVID-19 death rate. Coupled with data from the US Census Bureau, the GIS maps have identified zones with the majority concentration of COVID-19 deaths. These GIS maps can be utilized by mental health providers in order to strategize how to distribute mental health services in a post-pandemic world. All in all, I will discuss GIS maps displaying areas with a high Covid-19 impact within LA County, which I have named.
“Hot-Spot” maps, in order to predict where the greatest post-pandemic mental health burden will reside.

**ROOM 3: HUMANITIES CLUSTER**

**PRESENTER NAME: HESAM ABEDINI**

**Title:** A Post-Intercultural Path

**Abstract:** A musical work that includes qualities and elements of two or more musical cultures may be described by terms such as cross-cultural, world, intercultural, and multicultural. Compared to the term 'world music', which has been used for commercializing merchandised musical works, cross-cultural and intercultural carry more academic gravitas and also include the word ‘culture’ that is essential to the field. While in the past several decades many musicians have moved towards intercultural practices, in many cases their works turn into an unbalanced space where one musical culture appears as an exotic element within a dominant musical culture. I suggest taking a “post-intercultural” path, which can be divided into “post-inter” and “post-cultural”. In a “post-inter” path, neither the intention nor motivation of a composer or a musician is to combine two musical cultures, but rather it is an organic personal quality grown upon one’s experiences. The “post-cultural” path suggests that, while various musical cultures—which include different musical traditions—exist, in the process of a creative work culture is indeed a very personal concept. This presentation will be focused on introducing the idea of a post-intercultural path while showcasing the authors creative works, that crosses the boundaries between idioms as wide as Iranian Music, Jazz, and Western Contemporary Music.

**PRESENTER NAME: SOPHIA METCALF**

**Title:** Technically: Freedom

**Abstract:** This talk will be the first presentation of my thesis materials on finding freedom in technical movement. As a physical theatre artist, much of my work is about exploring in a free and loose way, and then incorporating highly technical movements (mime, dance, etc). This presentation will discuss theoretical approaches to finding freedom inside of highly technical movement, and work to prove my thesis that indeed technical movement leads to freedom.

**PRESENTER NAME: KRISTINA HORN**

**Title:** Cityscapes and Running Man: Play and Psychogeography in South Korean Television
Abstract: Running Man (RM) has become not only the longest running variety television show in Korea, but also one of the most popular television shows in Korea. This paper will examine how the show incorporates aspects of play, playfulness, and psychogeography as a means of de-rigidifying the functionalism of the urban landscape. Although RM still takes place within the moral conventions of Korean society, as Miguel Sicart’s theorization of playfulness suggests, their play provides a form of “occasional freedom and distance” from these conventions within the format of the show. Therefore, it presents a way of reimagining the urban landscape—from within the capitalist spectacle—that allows for forms of unconventional pleasure and leisure. Through the use of play within retail and tourist spaces, RM momentarily subverts the boredom and alienation of the urban landscape and allows for a reimagining of new forms of pleasure from within the city itself.

PRESENTATION NAME: GRIGORIOS MATHIOUDAKIS

Title: Maurice Ravel’s L’heure espagnole: Aesthetics and Philosophical Ideas in the context of Henri Bergson’s Early Works

Abstract: L’heure espagnole is an one-act opera by Maurice Ravel to a French libretto by Franc-Nohain. The opera’s setting is in Spain of the 18th century and the main characters are a clockmaker and his unfaithful wife who is trapped in her husband’s clocks. The notion of “time” and the comic elements are interrelated in a comic opera that is Ravel’s first attempt in the genre.

Henri Bergson’s early philosophical works deal with the meaning of “space” and “duration” and also to what extent something can be comic. In this paper I will examine L’heure espagnole within the scope of Bergson’s philosophical ideas in regard to the aesthetics of the opera. I will consider the music, the libretto, and the plot among others along with elements from the Spanish music tradition that Ravel incorporates in this work.

ROOM 4: CIVIC ENGAGEMENT BROADLY IMAGINED

PRESENTATION NAME: BRETT MERCIER

Title: Perceptions of Electability in the 2020 Democratic Primary

Abstract: Two pre-registered studies (conducted December, 2019 and February 2020) show that Democrats overestimate the reported prejudice of the American electorate, leading them to perceive presidential candidates from disadvantaged groups as less electable. Study 1 (MTurk; n = 728) found that Democrats overestimated the percentage of Americans who say they would not vote for presidential candidates from marginalized groups. Study 2 (Prolific; n = 930) used an experimental design to test the effect of correcting misperceptions about reported prejudice. Relative to a control group of Democrats who were not provided with any information, Democrats who were...
shown the true levels of reported prejudice in the American electorate perceived candidates from marginalized groups as being more electable.

**PRESENTER NAME: MEGHAN BALLARD**

**Title:** “No U.S. dough to help Jim Crow grow”: Constructing a “pathway” of Title VI from conception to contemporary implementation

**Abstract:** The Civil Rights Act of 1964 was one of the most hotly contested pieces of legislation in congressional history. A combination of amendments, filibusters, and split votes led to a drawn-out legislative process that took over a year to complete. While there exists substantial scholarship on the Civil Rights Act of 1964, much less has been written about one of its most contested components, Title VI, which addresses the use of federal funds to finance discrimination. Differing from its sister provisions, enforcement of Title VI requires voluntary compliance and relies on administrative rather than judicial processes. Such requirements were not part of the original draft, but were included after extensive congressional debate. Understanding the causal importance of initial conditions, this project first attempts to gain a deeper understanding of the intended purpose of Title VI by teasing out the conflicting interests that shaped the statute’s final language. Then, using a historical institutionalist perspective of legal change and path dependence, this project identifies critical junctures that have shaped the “pathway” of Title VI from conception to contemporary implementation. Archival data and oral histories were triangulated to construct a pathway that demonstrates how and why language rights, in criminal justice processing, have advanced under the protection of Title VI. This project answers recent calls to make greater use of archival data in criminological and sociolegal research, and sheds light on this lesser studied tool of the civil rights arsenal.

**PRESENTER NAME: SIRUI WAN**

**Title:** When Do Students Begin to Think that One Has to be Either a Math Person or a Language Person?

**Abstract:** Believing that one is either a “math person” or a “language person” can have profound implications for students’ engagement and performance in different activities and for their educational and career choices. One important source of information children use to form such self-relevant motivational beliefs are dimensional comparisons; that is, students engage in intraindividual comparisons of their subjective abilities across academic domains such as math and language arts when they make self-evaluations. Despite their profound impact on students’ self-perceptions and thus on students’ educational and career choices, little is known about when dimensional comparisons begin to influence children’s self-perceptions, how this influence might change as children grow older, and whether the pattern varies across different motivational beliefs.

To help address this gap in the literature, my research focuses on changes in dimensional comparisons during K-12. I found that students’ reliance on dimensional
comparisons to form motivational beliefs increases across the K-12 school years. In addition, I found that the increase in dimensional comparisons may result from 1) the increase in students’ ability to make dimensional comparisons and 2) the increase in their tendency to use dimensional comparison information in ability self-evaluation.

My work will help understand students’ decision-making process and achievement development. Moreover, it will provide implications for interventions aimed at raising academic motivation of students, especially girls and adolescents.

**PRESENTER NAME: TANUJ RAUT**

**Title:** Caving in to capital

**Abstract:** Plato’s allegory of the Cave in Book VII of The Republic, is one of the most enduring analyses in Western philosophy about the importance of philosophical education and its relation to a just society. Generally, the prisoners represent ordinary citizens whereas the puppeteers represent the politicians, sophists, and poets, who exert a considerable influence in determining our views about justice. However, James Wilberding (2004) argues that it’s the other way around. He suggests that the prisoners, in trying to guess the shadows on the wall before them, represent politicians, sophists and poets who are trying to understand and predict the citizen’s views on what constitutes justice, and are essentially controlled by them. In this essay, I argue that Wilberding’s ‘unorthodox’ interpretation of The Cave leads to the following puzzle: if the prisoners in the cave do not know, or are unaware of the source of the shadows, how can they represent politicians, sophists, and poets, who clearly know the source of the opinions they’re trying to predict in order to gain prestige? I then turn to analyzing the guessing game among the fettered prisoners, which Wilberding suggests, is misunderstood by the mainstream readers of The Cave. Following a novel account of games and the construction of agency by Nguyen (2020), I interpret the prisoners’ guessing game as a systemic gamification of public discourse. Such gamification, prevalent on social media and academia more generally, simplifies our values and undermines the goal of scholarly engagement. As such, The Cave can be read as a warning against the instrumentalization of our activity for the sake of social capital.

**PRESENTER NAME: FUXIN ZHAI**

**Title:** Financial Development and R&D Investment

**Abstract:** We extend the model of creative destruction by introducing a banking sector which receives deposits and allocates credits between research and production activities. The model demonstrates that financial development, as described by the expansion of bank deposit, narrows down the potential financing demand gaps and possible loss of value of research sectors, thus increasing innovation investments and economic growth. Obtaining data of China’s listed manufacturing companies between 2007 and 2016, we provide robust evidence the advancement of financial system stimulates firms’ R&D input. Furthermore, the positive effect is significantly larger for
young, small and non-state-owned firms, and for industries with high external financial dependence or high technical complexity.

ROOM 5: DATA AND LOGISTICS

PRESENTER NAME: HAMED GORJIARA

Title: Jaaru: Efficiently Model Checking Persistent Memory Programs

Abstract: Persistent memory (PM) technologies combine near DRAM performance with persistency and open the possibility of using one copy of a data structure as both a working copy and a persistent store of the data. Ensuring that these persistent data structures are crash consistent (i.e., power failures) is a major challenge. Stores to persistent memory are not immediately made persistent — they initially reside in processor cache and are only written to PM when a flush occurs due to space constraints or explicit flush instructions. It is more challenging to test crash consistency for PM than for disks given the PM’s byte-addressability that leads to significantly more states.

We present Jaaru, a fully-automated and ultra-efficient model checker for PM programs. Key to Jaaru’s efficiency is a combination of (1) a new partial order reduction technique based on constraint refinement that can reduce the number of executions that must be explored by many orders of magnitude, and (2) a lazy exploration technique that effectively leverages commit stores, a common coding pattern, to reduce the model checking complexity from exponential in the length of program executions to quadratic. We have evaluated Jaaru with PMDK and RECIPE, and found 25 persistency bugs, 24 of which are new. Jaaru is also orders of magnitude more efficient than YAT, a model checker that eagerly explores all possible states.

PRESENTER NAME: ZHEN CHEN

Title: The Asymptotic Capacity of Private Search

Abstract: The private search problem is introduced, where a dataset comprised of L i.i.d. records is replicated across N non-colluding servers, each record takes values uniformly from an alphabet of size K, and a user wishes to search for all records that match a privately chosen value, without revealing any information about the chosen value to any individual server. The capacity of private search is the maximum number of bits of desired information that can be retrieved per bit of download. The asymptotic (large K) capacity of private search is shown to be 1-1/N, even as the scope of private search is further generalized to allow approximate (OR) search over a number of realizations that grows with K. The results are based on the asymptotic behavior of a new converse bound for private information retrieval with arbitrarily dependent messages.
**PRESENTER NAME:** IRENE MARTINEZ

**Title:** Efficient agent-based model of network trip flow with stochastic demand patterns

**Abstract:** The transportation system presents a complex network and many agents involved, i.e., passengers, vehicles, and goods. Modeling the vehicle-trips inside the network involves significant computational efforts. Recently, a simpler model has gained interest among the research community. This so-called “bathtub model” is very appealing to study network dynamics because it treats the road network as an undifferentiated unit, where the absolute space dimension and the network itself are not important. The space dimension becomes relative to the trip destination. However, these macroscopic models that track the active trips and cumulative trip initiation and completion cannot capture individual vehicle travel times. In this work, we present a (simulation) model that can solve the trip initiation, progression, and completion of millions of individual vehicle-trips based on the assumptions of the bathtub model for a generic trip distance distribution, similar to the generalized bathtub model by Jin 2020. The model can be solved for a deterministic set of trips with a given departure and trip length or can be used to run Monte Carlo simulations to capture the probabilistic nature and the average behavior and variation for a given trip distance distribution. The model can be normalized by the network lane miles, which allows for a significant reduction of computational cost. In summary, the proposed model can be viewed as an agent-based model and therefore can be easily extended to other systems where the person-and vehicle-trips are not the same.

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**ROOM 6: MEDICAL EXPERIENCE**

**PRESENTER NAME:** DIANA CARRENO

**Title:** Nicotine plus cue-induced reinstatement is enhanced in adolescent Sprague-Dawley rats containing the Human 3’UTR polymorphism (rs2304297) in the alpha(α)6 nicotinic acetylcholine receptor subunit

**Abstract:** Background: 34 million adults in the United States are current smokers, a majority began smoking during adolescence. Large-scale human candidate gene studies have indicated a genetic variant in the alpha(α)6 nicotinic acetylcholine receptor subunit (nAChR), encoded by Chrna6C123G, may play a key role in adolescent smoking. We hypothesize the Chrna6C123G polymorphism, rs2304297, selectively enhances nicotine + cue-induced reinstatement, but not nicotine- or cue-only reinstatement in GG (risk) versus CC (non-risk) allele carriers. Methods: Genetically modified adolescent rats were food trained under a fixed-ratio one (FR1) schedule of reinforcement and progressively increased to FR5TO20. Animals were implanted with catheters and began nicotine self-administration (15 µg/kg/infusion) at FR5. Upon reaching stable responding, reinforced behavior was extinguished by removal of drug and cues. Reinstatement testing began for cue only, nicotine only, and nicotine + cue in
a randomized order. Animals were returned to extinction conditions 2 days minimum between testing. Results: No genotype effects are observed for food reinforcement during acquisition at FR5 or progressive ratio schedule of reinforcement. All animals show a preference for reinforced versus non-reinforced responding. CC and GG-allele carriers exhibit equivalent nicotine reinforcement and extinction. GG versus CC rats exhibit potentiated nicotine + cue induced reinstatement. Conclusions: Our findings indicate the GG risk allele carriers exhibit enhanced nicotine + cue-induced reinstatement at a low nicotine dose without altering natural food reward, nicotine reinforcement, cue- or nicotine-only reinstatement. Understanding the role of functional human genetic variants in nicotine seeking among adolescents is key for development of future prevention and intervention strategies.

**PRESENTER NAME:** HEATHER ABRAHIM

**Title:** "The Best Medicine:" Supporting Patient-Centered Care With Personal Pet Visitation During Hospitalization

**Abstract:** Background: The human relationship with companion animals has developed over thousands of years. Today, pets are often considered integral members of the family. Because some patients include animal as well as human members in their definition of “family,” many hospitals in the United States and Canada allow personal pets to visit patients while they are hospitalized. Little information exists in the literature to support personal pet visitation in the hospital aside from anecdotal evidence and opinion pieces. One published study examined the benefits a personal pet visitation program from the perspective of the health care providers and volunteer animal handlers (Yamaski, 2018). To this author’s knowledge, no study has examined the patient’s perception of personal pet visitation in the hospital.

Purpose: The purpose of this study is to explore how patients hospitalized on a progressive care unit describe their experience of personal pet visitation.

Methods: This qualitative transcendental phenomenological study focuses on the patient’s given descriptions to describe the essence of the experience of personal pet visitation in the hospital.

Results: TBD

Conclusion: TBD

Translation to Practice: Patient- and family-centered nursing care should be informed by the best available evidence. Knowledge and data derived from robust scholarly methods should drive how we deliver care. The practice of allowing personal pets to visit hospitalized patients as a part of patient- and family-centered care is not based on scholarly research, but on anecdotal evidence and the “conviction within the health care professions, academia, and the community in general that animals, as social supports, provide benefits to humans (Chur-Hansen et al., 2018, p.672).” If nursing is to
continue to support this personal pet visitation, we need a scientific knowledge base with which to justify our actions.

**PRESENTER NAME: VICTOR LEE**

**Title:** Fat Loss is a HIIT: Tracking Exercise-Induced Fat Metabolism Using Diffuse Optical Spectroscopic Imaging (DOSI)

**Abstract:** Background: Noninvasive procedures for lipolysis have emerged without reliable ways to study their efficacy. Fat metabolism through lipolysis has been shown to increase through exercise, specifically high-intensity interval training (HIIT). Real-time, noninvasive imaging can detect and monitor tissue-level changes and provide a positive reference for analysis of additional lipolysis modalities. Diffuse optical spectroscopic imaging (DOSI) is a novel, noninvasive imaging system that uses measurements of tissue lipid and water fractions and hemoglobin concentrations to reliably quantify fat metabolism.

Objective: This study aims to determine the feasibility of monitoring acute changes in abdominal fat metabolism after HIIT with DOSI.

Materials and Methods: Active subjects completed a 10-minute HIIT routine that contained 20 core exercises, including crunches, leg lifts, and isometric holds. Lower abdominal DOSI measurements were collected immediately before and after the HIIT routine using a 7x4 grid pattern (12x6 cm). Average values of lipid and water fractions and total hemoglobin concentration across the abdomen before and after exercise were found using MATLAB. Tissue optical index (TOI) was calculated as a measure of fat metabolism using the formula TOI=(Deoxygenated Hb * Water)/Lipid and statistical analysis was performed using paired T-tests.

Results: For 25 subjects (10 men/15 women, ages 22-31) with BMI 17.6-26.0, total hemoglobin increased significantly by 1.13 ± 2.69 µM (p=0.046), and TOI increased significantly by 0.28 ± 0.60 (p=0.03). Tissue water and lipid fractions did not change significantly after exercise.

Discussion: This study demonstrates that DOSI can capture acute effects from HIIT-stimulated metabolic activity in abdominal fat. DOSI findings are consistent with a significant increase in total hemoglobin, suggesting increased tissue perfusion. This change results in significantly increased TOI acutely after intervention, suggesting increased fat metabolism. Our findings promote the application of DOSI as a reliable, easy-to-use method to assess fat loss acutely after noninvasive lipolysis procedures.