Grad Expo
March 19th, 2021

Grad Expo 2021 Program Information
Welcome to Grad Expo 2021!

We would especially like to thank Provost and Senior Vice Chancellor Ann Cudd. From the School of Arts and Sciences, we thank the Bettye J. and Ralph E. Bailey Dean of Arts and Sciences, Kathleen Blee; and Associate Dean for Graduate Studies and Research Holger Hoock. These administrators have been extraordinarily generous in their continuing and increasing support for this conference. We also extend our thanks to Carol Mullen, director of communications for the School of Arts and Sciences, for supporting the marketing and advertising efforts for this year’s Expo. Thanks also to the Department of University Marketing Communications, in particular Marygrace Reder, for their hard work in coordinating the creation of the wonderful promotional materials. The Committee is indebted to the advocacy of the department representatives serving on the Arts and Sciences Graduate Student Organization (A&S GSO) Council. Without their commitment, this event would not be possible. We extend our appreciation to the student and faculty judges who have taken time out of their busy schedules to help moderate this event and share their feedback with presenters.

This interdisciplinary exposition and conference is a unique opportunity for graduate students from the humanities, social sciences, and natural sciences to develop presentation skills and engage with research from students across the Dietrich School of Arts & Sciences. The Grad Expo committee is grateful to have the opportunity to coordinate this event.

And of course, we thank the presenters for sharing their research and work with the University of Pittsburgh community. Enjoy the day!

Sincerely,
The 2021 Grad Expo Committee

Hannah Standiford, Ethnomusicology, Chair
Dominique Branson, Linguistics
Lee Caplan, Jazz Studies
Michael O’Brien, Linguistics
Schedule of Events (available at http://asgso.pitt.edu/grad-expo-schedule)

Paper Presentations

10:00am
Panel 1
Yucheng Wang, Public Transit Fares and Gasoline Consumption: Evidence from Beijing
David Agorastos, Terms of Debts: Contextualizing Student Loan Default

Panel 2
Yangqiuting Li, How learning environment predicts male and female students’ physics motivational beliefs in introductory physics courses
Danny Doucette, Equitable Group-Work in Introductory Physics Labs
Sonja Cwik, Physics self-efficacy of male and female students controlling for grade

Panel 3
Alex Silver, Parental math talk is not uniformly beneficial for young children
Emily Roemer, Object Engagement, Parent Labels, and Language: Dyadic Play in Toddlers at Elevated Likelihood of Autism
Joshua Schneider, Infant Walking Shapes Language and Gesture Input from Caregivers

11:00am
Panel 1
Kathryn Pataki, Legalizing Sex Work: The Mirage of Sex Worker Autonomy in The Netherlands
Alison Mahoney, Queer/Crip Intersections: Drag Syndrome’s Collective De/Politicization of Disability

Panel 2
Reed Van Schenck, Wacky Ideologies: The Memetic Circulation of the Political Compass
Ann Fleming, "The Louisville Platform as a Roadmap for Republicanism"
Jungmin Han, The Effect of Reciprocated Cooperation between International Rivals on the Public’s Threat Perceptions

Panel 3
Sharon Toth, Community outreach initiatives: Using biological anthropology to promote science education
Dave Klein, The histone chaperone FACT is essential for maintenance of stem cell pluripotency
Yunye Zhu, *Determination of Pol II transcription start site sequence specificity in Saccharomyces cerevisiae using massive promoter variant libraries*

1:00pm
Panel 1
Amanda Tien, *Takeout and Uptake: An Analysis of Food as a Narrative and Cultural Device in Chinese American Novels*
Ben Naismith, *Finding the sweet spot: Learners’ productive knowledge of mid-frequency lexical items*

Panel 2
Marina Salnikova, *A New Way of Publicity: Mediatization of Contemporary Paganism in Scandinavia*
Nathanael Joseph, *The Economic Freedom Fighters and the Dynamics of Insurgent Practice in South Africa*
Lee Caplan, *Ancient Cynic Resonances in Deweyan Music Education*

Panel 3
Swati Arora, *Dynamics of Ion Locking in Doubly Polymerized Ionic Liquids*
Harsh Vashistha, *Non-genetic inheritance restraint of cell to cell variation*
Rudrajit Banerjee, *Revisiting the initial state(s) of the inflaton*

2:00pm
Panel 1
João V. Guedes-Neto, *Bureaucratic Polarization*
Marissa Lepper, *It's Not My Fault: Excuse-Seeking Behavior in the Intertemporal Domain*
Jonathan Devine, *To Reenact the Reenactment: Documenting Horror and Animating Absence in La Rage du Démon*

Panel 2
Lorraine Blatt, *District-Level School Choice, Segregation, and Test Score Gaps*
Brianna Natale, *Systemic inflammation contributes to the association between childhood socioeconomic disadvantage and midlife cardiometabolic risk*

Poster Presentations
10am-12pm
Poster 1
Tianping Gu, *Search for Charmed Baryons Oscillations at Belle*

Poster 2
Benjamin Patty, Elucidating a nucleosome-based network of non-coding RNA regulation in embryonic stem cells.

Poster 3
Payal Arora, Characterization of the functional network of Pol II catalysis in the budding yeast Saccharomyces cerevisiae

Poster 4
Elaine Nguyen, Identifying the molecular determinants that drive the LARP1 interaction with 5' TOP mRNAs

Poster 5
Veronica Iriart, Herbicide drift reveals species-level variation for resistance, tolerance, and effects on flowering: community-level analysis reveals implications for pollinator resources

Poster 6
Sarah Tripplehorn, Investigating the recruitment and function of the nucleosome remodeler Chd1

Poster Presentations
1pm-3pm
Poster 1
Bingbing Duan, Functional dissection of RNA polymerase active sites by deep mutational scanning

Poster 2
Rachel Bainbridge, Zinc Protection of Fertilized Eggs is Conserved in Non-Mammalian Species

Poster 3
Neil Silveus, Hell and the High School: 1920s Antievolution Policies and Demand for Public Schooling

Poster 4
Katie Morrow, A scale problem for the Ecosystem Services Argument for protecting biodiversity

Poster 5
Miroo Lee, Language Mode Effects on Bilinguals’ Speech Perception

Poster 6
Constanza Bassi, Photostimulation of incoming feedforward axons drives variable responses in mouse posterior parietal cortex

Poster 7
Kathryn Pataki, Legalizing Sex Work: The Mirage of Sex Worker Autonomy in The Netherlands
Abstracts (in alphabetical order by presenter last name)

**David Agorastos**  
10am, Panel 1  
**Terms of Debts: Contextualizing Student Loan Default**

This study examines how financially-distressed student loan borrowers choose to default on their debts and how the consequences of these default choices affect the well-being of defaulted borrowers and the aggregate economy. Consumers typically hold diverse debt portfolios containing some combination of auto loans, credit cards, mortgages, and student loans. These debts have terms other than just the interest rate and repayment plan. These include (i) whether the debt is collateralized by an underlying asset, (ii) whether the debt is dischargeable through bankruptcy, and (iii) the penalties associated with default. Amongst these debts, student loans are unique as they are uncollateralized and non-dischargeable, so the financial penalties associated with default are particularly severe. The differences in terms between these types of debt present trade-offs for borrowers who are unable to cover the required minimum monthly payments over all of their debts. In other words, the terms of these debts cause financially-distressed borrowers to choose between an immediate pain, such as the loss of a car, credit access, or property, and a lasting pain, such as the garnishment of wages and withholding of both tax refunds and social security benefits. I document borrowers’ default choices across all of their debts throughout the early life cycle and analyze how these default choices consequently affect their financial well-being before and after default on a given debt or set of debts using an event study design. Preliminary results suggest that student loan borrowers are most likely to default shortly after entering repayment, equally as likely to default on student loans as credit cards, in spite of the much more severe penalties for student loan default, and experience greater and more persistent negative effects to their credit score after default, thereby persistently increasing prices for credit and/or limiting credit access throughout the early life cycle.

**Payal Arora**  
10-12noon, Poster Session 1  
**Characterization of the functional network of Pol II catalysis in the budding yeast Saccharomyces cerevisiae**

Transcription in the budding yeast Saccharomyces cerevisiae involves the 12-subunit RNA Polymerase II and a combination of factors that drive transcription start site selection, elongation and eventually termination by the Pol II complex. The trigger loop (TL), a highly flexible region at the catalytic center of the largest RNA Pol II subunit Rpb1, moves between an open and a closed conformation to execute a multitude of Pol II functions: substrate selection, catalysis, and putatively translocation, these steps comprising the complete nucleotide addition cycle. We propose that many potential contacts within Pol II may balance speed with fidelity. If these contacts are disrupted, there is a potential to alter Pol II activity. Additionally, transcription cues from other non-Pol II transcription-associated and chromatin-associated factors could also regulate TL mobility and hence Pol II catalysis. We are identifying functional contacts that restrain the TL, by isolating spontaneous mutants that counteract the growth defective loss of function Rpb1 TL mutation-H1085Y, by possibly gaining function. Such rare, gain of function mutations shed on specific interactions that are at play in a functional network. Our preliminary results suggest the involvement of both inter- and intra-molecular interactions balancing Pol II catalysis with 80% of the suppressor mutations identified in Rpb1, that lie in close proximity to the entire trigger loop. I will be exploiting the AmpliSeq custom sequencing to identify mutations that do not reside in Rpb1 and eventually characterize them, forming a model to explain the role of individual residues in TL function. Studying the suppressor mutants will allow us to identify critical interactions or residues within the Pol II
complex or other transcription or chromatin associated factors that regulate Pol II catalysis in Saccharomyces cerevisiae.

Swati Arora  
1pm, Panel 3  
**Dynamics of Ion Locking in Doubly Polymerized Ionic Liquids**

Here we present a systematic study of charge transport in doubly-polymerized ionic liquids (DPILs) in which both charged species of an ionic liquid are covalently attached to the same polymer chains. Broadband dielectric spectroscopy is used to compare the synthesized DPIL polymer to the conventional singly-polymerized ionic liquids (SPIILs) in which only one charged species is tethered to the polymer chains. The dielectric measurements reveal that copolymerization of both the ionic species in DPIL significantly reduces the ionic conductivity and polymer relaxation timescales in comparison to SPIILs. These results suggest that the existence of strong physical crosslinks formed by ion pairs between polymer chains in DPIL are core to the “ion locking” phenomenon in DPIL. This study will stimulate advances for developing DPILs as promising materials for driving “ion locking” applications in novel classes of organic electronics.

Rachel Bainbridge  
1-3pm, Poster Session 2  
**Zinc Protection of Fertilized Eggs is Conserved in Non-Mammalian Species**

In most sexually reproducing species, an embryonic lethal condition, termed polyspermy, develops when an egg is fertilized by more than one sperm. Therefore, the egg utilizes polyspermy blocks, mechanisms by which it prevents sperm entry following successful fertilization. One such mechanism, the slow block to polyspermy, involves the creation of a physical block to sperm entry. This occurs as a result of a cortical granule exocytosis. It has been observed that in mammals, zinc is released as part of this exocytotic event, and is hypothesized to contribute to the protection of eggs from sperm entry. We have demonstrated that zinc release occurs at activation of the eggs of the frog Xenopus laevis, the salamander Ambystoma mexicanum, and the zebrafish Danio rerio. Eggs of X. laevis, as well as the sea urchin Strongylocentrotus purpuratus and the cnidarian Hydractinia symbiolongicarpus, inseminated in increasing concentrations of zinc display reduced rates of embryonic development, demonstrating that zinc inhibits fertilization. In X. laevis, we determine that zinc acts to block sperm entry during the first 30 minutes of fertilization. We also demonstrate that various transition metals inhibit fertilization, suggesting that the metal acts, at least in part, by coordinating proteins of the egg extracellular matrix to prevent sperm entry. This data represent evidence that zinc protection of fertilized eggs is a polyspermy blocking strategy conserved in the eggs of sexually reproducing species from mammals to cnidarians.

Rudrajit Banerjee  
1pm, Panel 3  
**Revisiting the initial state(s) of the inflaton**

How did the universe begin? This age-old question has found a partial modern answer in the “inflationary paradigm”: moments after its birth in the Big Bang, the universe underwent a period of rapid expansion, driven by a homogeneous scalar field dubbed the “inflaton”. Stars, galaxies, and other astrophysical structures are believed to arise as a consequence of the free quantum fluctuations of the inflaton field. The inflationary paradigm, however, leaves many important questions unanswered. Among them are the near perfect initial homogeneity of the inflaton, and the “free nature” of the quantum state in which it is born. In fact, the inflationary models favored by current data from the PLANCK satellite are not free of self-interactions. This urges on us the question why the inflaton should be born in a non-interacting state
or else what its true initial state is. My research on quantum field theory in the early universe aims to address this critical but somewhat overlooked problem in modern cosmology. I am developing a new technique for quantum field theory in curved spacetime, which can be succinctly summarized as “reducing quantum field theory to quantum mechanics”. In this talk I give an overview of this technique, and describe how it would lead to the first rigorous approach to computing the initial state of the inflaton.

**Constanza Bassi**

**1-3pm, Poster Session 2**

**Photostimulation of incoming feedforward axons drives variable responses in mouse posterior parietal cortex**

When sensory signals enter the brain, they are selectively processed by a highly organized hierarchy of regions in the cerebral cortex. In this cortical hierarchy, primary sensory areas serve as the entry point for visual and auditory signals, transmitting sensory information to higher-level association regions of the cortex via feedforward (FF) projections. Within association-level areas, such as the posterior parietal cortex (PPC), these FF multimodal sensory inputs converge with feedback (FB) projections from other association areas, guiding behavioral outputs (D’Souza & Burkhalter, 2017). Behavioral state, such as locomotion and task engagement, flexibly modulate responses to incoming sensory inputs in primary sensory areas and in PPC (McGinley et. al. 2015; Runyan et. al., 2017). Here we characterize the light-evoked responses of PPC neurons to stimulation of incoming auditory FF projections in vivo. We use two-photon calcium imaging to measure fluorescent changes in activity of neurons in PPC and Channelrhodopsin (ChR2), an excitatory optogenetic opsin, to stimulate incoming FF auditory axons in mice voluntarily running on a spherical treadmill. We calculate the modulation of stimulating incoming auditory signals and locomotion in driving PPC population activity. Preliminary results show variable light-evoked responses to stimulating the incoming FF projections across PPC neurons and across trials. These results highlight the dynamic processing of PPC neurons to incoming FF sensory signals.

**Lorraine Blatt**

**2pm, Panel 2**

**District-Level School Choice, Segregation, and Test Score Gaps**

Currently, over five and a half million students in the United States attend magnet or charter schools, a number that has more than tripled since 2001 (NCES, 2018). Findings on the implications of school choice are mixed due to heterogeneity in school choice landscapes across different contexts. This study seeks to understand broader trends in the relationship between school choice and structural education equity by examining district-level magnet and charter school enrollment, segregation, and test score gaps in third through eighth grade from 2009 to 2015. Data are drawn from over 4,000 school districts and are obtained from the Stanford Education Data Archive 2.1 (Reardon et al., 2018) and the U.S. Department of Education’s Common Core of Data (2017). The most robust findings suggest that higher district-level charter school enrollment is associated with larger white-black test score gaps and this association is mediated by greater white-black segregation. The findings also indicate that there is an association between higher magnet school enrollment and larger white-Hispanic test score gaps at the district level, mediated to a smaller degree by white-Hispanic segregation. Overall, this study yields small effect sizes but suggests that the expansion of school choice may exacerbate structural education inequity.

**Lee Caplan**

**1pm, Panel 2**

**Ancient Cynic Resonances in Deweyan Music Education**
Ancient Cynic literature/anecdotes advance an embodied form of social critique, pedagogical models, and ethical ways of being in the world. A similar project exists in the American pragmatic John Dewey, as both schools of thought criticize metaphysical projects that polarize our world, alienate subjectivities, and lead to a divided self-hood. The Cynics and Dewey share the same discontent with Platonic thought, and later Dewey observes a similar metaphysical error in Cartesian models. Cartesian and Platonic rhetoric results in a philosophy that privileges abstractions over embodied experience. Dewey essentially maps the Cartesian mind/body problem to our everyday experiences and as an extension of that, our everyday aesthetic experience. Notably for Dewey and the Cynics, aesthetics acts as a realm for self-reclamation. The mission of the Cynics, Dewey, and recent trends in music pedagogy is complete reintegration of the self.

This paper seeks to bring together the common ideals underlying the aesthetics/pedagogy of Ancient Cynicism and Deweyan pragmatism. Through hermeneutically interpreting Cynic anecdotes and juxtaposing them alongside Deweyan pragmatics, a new understanding emerges. Instead of the Cynic rendered as a fringe anarchistic disrupter, we see a set of coherent principles that helps to inform later systems that critique Platonic projects. Many philosophers such as Dewey challenge inherited Platonic beliefs—why look to some of Plato's earliest critics for inspiration?

Sonja Cwik
10am, Panel 2
Physics self-efficacy of male and female students controlling for grade
Societal stereotypes and biases pertaining to who belongs in physics and who can excel in physics can impact motivational beliefs, e.g., of women and racial and ethnic minority students in physics courses. This study examines the self-efficacy of men and women with similar performance in two introductory algebra-based introductory physics courses. These were courses at a large university in the US taken primarily by biological science majors, many of whom are interested in health professions. Our findings show a gender gap in self-efficacy disadvantaging women when controlling for course grade in both physics 1 and physics 2. Additionally, most of the gender gap in self-efficacy is due to biased perceptions rather than performance in the courses. These findings can be useful to provide support and create an equitable and inclusive learning environment to help all students excel in these courses.

Jonathan Devine
2pm, Panel 1
To Reenact the Reenactment: Documenting Horror and Animating Absence in La Rage du Démon
This paper consists of a close reading of the fictionalized French documentary, La Rage du Démon/Fury of the Demon (Fabien Delage, 2016), as a way to highlight the spectator-driven nature of both documentary and horror. Most scholarship on the horror documentary relies on either found footage mockumentaries or snuff/mondo films, so my paper aims to add to this ever-growing corpus by looking at films – such as Démon – that do not fall easily within these two categories. Here, I bring animation into the conversation, as Démon shifts towards a certain fictionality due to a reliance on non-photographic art forms, as well as other fictional, narrative films, as its primary forms of evidence. Delage’s film concerns the 1897 film of the same name, attributed Georges Méliès. According to interviewees such as Alexandre Aja and Méliès’ great-great-granddaughter Pauline, the short was screened upon release, and again in 2012, where, on both occasions, audiences were said to have become possessed and violent. We, as viewers of Delage’s film, never see any excerpts from the Méliès counterpart: instead, Delage relies on excerpts from Méliès’ other films, such as Le Diable au couvent/The Devil in a Convent (1899), as well as paintings that depict demons, as a form of extrapolation and speculation. In this way, I characterize Delage’s use of imagery as a form of reenactment, following Cristina Formenti’s work on animated documentary that emphasizes the different materiality of animated – as opposed to live-action – footage,
the use of which becomes the “sincerest form of docudrama” (103). Yet Delage goes one step further than Formenti’s example of The Sinking of the Lusitania (Winsor McCay, 1918), reenacting imagery that may not have any original referent, even when he does rely on live action. In the horror documentary, reenactment as a technique does not have the same indexical link to reality as an actual death recorded on film, where the scares and shock emanate from the verisimilitude of the on-screen images, such as the animal killings in Cannibal Holocaust (Ruggero Deodato, 1980). With this in mind, I propose that Delage’s Démon creates a liminal space between existence and non-existence, as Méliès’ 1897 film is only “seen” via other artforms coupled with vague, and sometimes contradictory, oral testimony from Delage’s interview subjects. Thus, Delage’s film is animated in a much broader, bringing-to-life sense – as in the Latin animo.

Danny Doucette
10am, Panel 2
Equitable Group-Work in Introductory Physics Labs
What does it mean for a science lab course to be equitable? When students do group-work in foundational science classes, biases may be perpetuated or exacerbated, resulting in inequitable learning experiences. For example, women may be assigned secretarial duties. Using a mixed methods approach, we have documented gendered task division in the introductory physics lab, where masculinity in the culture of physics serves to minoritize women students. Our results indicate that inequitable task division is detrimental to all students, especially women. Furthermore, remote instruction in Fall 2020 allowed us to conduct a natural experiment based on lab groups that were randomly assigned on Zoom (n=576). We found that requiring students to self-select roles reduced the incidence of inequitable task division. We also found that groups with isolated minorities underperformed compared to their peers. These findings may provide useful guidance for instructors who want to make group-work in their classes more equitable.

Bingbing Duan
1-3pm, Poster Session 2
Functional dissection of RNA polymerase active sites by deep mutational scanning
Transcription of genetic information in nuclei relies on at least three multisubunit RNA polymerases (msRNAPs) in eukaryotes. The similar msRNAPs have an ultra-conserved active site domain, the trigger loop (TL), that participates in nucleotide selection, catalysis, and translocation by swinging between an open, catalytically inactive state and a closed, catalytically active state. Complex genetic residue-residue interactions in yeast Pol II TL have been observed previously, indicating a highly coordinated functional network of residues controlling transcription activity. Previous studies have found that an identical mutation in a residue conserved between yeast Pol I and Pol II TLs yielded different phenotypes. This observation suggested that even functions of conserved residues may be shaped by interactions between the residue and its enzymatic context. Interpretation of the function and mechanism of RNA polymerases based on conservation or a limited number of substitutions might therefore be misleading. We aim to compare and contrast three yeast RNA polymerases using deep mutational scanning and genetic interaction mapping on residues within and interacting with the TLs as a model. We will identify the prevalence and strength of the genetic interactions and epistasis within yeast Pol II by analysis of all Pol II TL single mutants, a subset of double mutants, and evolutionarily observed multiple mutants. Additionally, to comprehensively evaluate how divergent the three ultra-conserved TLs are, we will compare the phenotypic and fitness landscapes of the TLs by comparative deep mutational scanning in each system. These studies will reveal the conservation and diversification of mechanisms in multisubunit RNA polymerases.
Ann Flemming
11am, Panel 2
Functional dissection of RNA polymerase active sites by deep mutational scanning
I will present a shortened synopsis of my Master’s Thesis, titled “Galvanizing Germantown: The Politicization of Louisville’s German Community, 1848-1855.” In this project, I tracked the life and works of left-wing 1848er Karl Heinzen, who participated in the Revolutions of 1848-49 across German Central Europe and eventually immigrated to the United States, settling at one point in my hometown of Louisville, KY. As a port city within a slave state, this proved an uncomfortable yet challenging site for Heinzen’s radical politics.
The name and subject matter of this presentation is taken from the title and contents of the second chapter of my thesis. As such, I will concentrate on Heinzen’s most noteworthy action during his stay in Louisville--that of composing the Louisville Platform with other radical German immigrants. In this proclamation, Heinzen and others emphasized the American injustices of this period, such as slavery, wage inequality, women’s disenfranchisement, and hatred toward immigrants. They put forward ideas for making the US more democratic and egalitarian in policy, as well as representative of the country’s demographics at the time.
Their messages sparked intense debate among nativists who scorned their arguments and activist groups who demanded similar progressive change in the early 1850s. As immigrants, Heinzen and his contemporaries carried their revolutionary mission for increased freedom, equality, and representation under European monarchies to the US, proving through their efforts the contributions and progress that could be made in society by immigrants asserting their sense of belonging. In my presentation, I will address Heinzen’s Louisville Platform, his philosophy, and how the activist background of these revolutionary immigrants influenced US politics and society. I will also mention how the Louisville Platform highlights issues still relevant in modern times, such as voter suppression of minorities, nativist sentiment, and the rise of economic inequality.

Tianping Gu
10-12noon, Poster Session 1
Search for Charmed Baryons Oscillations at Belle
We search for baryon number violation in B decays to pairs of charmed baryons and report the results based on the full Belle data sample. We interpret our measurement in terms of charmed baryons-antibaryons oscillations, which is a promising pathway to explain the missing piece in Sakharov’s three conditions for baryogenesis. We outline the analysis procedure, background suppression optimization, data-based calibration approach, and present preliminary results for oscillation frequency and, alternatively, for baryon number violating branching fraction.

João V. Guedes-Neto
2pm, Panel 1
Bureaucratic Polarization
Do bureaucrats polarize against each other? Scholars are well aware that civil servants develop workplace identities. These will guide the appropriate behavior within one’s own organization and may even influence the outcomes of interagency cooperation. In this paper, I borrow the tools of social psychology to measure individual-level agency affect through a survey conducted with samples of American and British bureaucrats. This strategy has been used by psychologists to measure social identity and intergroup relations since the 1940s and, in the field of political science, became prominent in the last decade when adapted to the study of affective polarization. Based on a new data set, I test
whether interagency social distance predicts bureaucrats’ expectation of success in implementation processes that require cooperation between different public departments. I complement this analysis with qualitative data obtained through open-ended questions. My findings provide new theoretical and methodological insights to the study of organizational culture, workplace identity, and coordination problems.

Jungmin Han
11am, Panel 2
The Effect of Reciprocated Cooperation between International Rivals on the Public’s Threat Perceptions
Scholarship on international rivalries has argued that reciprocated cooperation is an important step in de-escalation because the simultaneous coordination attenuates public “enemy” images on both sides as well as decreasing the incentives for leaders to undo the cooperation in the future. However, this optimistic conclusion is derived from an untested and potentially unwarranted assumption that the public homogenously reacts to international signals. This paper aims to explore this assumption and demonstrate the need to reorient our focus to the micro-foundations of the public threat perceptions. In contrast to previous research, I argue that reciprocated cooperation with a rival has manifold impacts on the public threat perceptions towards the adversary. Some members of the public will be more cognitively inflexible than others. For example, politically conservative people who are strongly anchored in preexisting antagonism against the rival tend to distrust the cues of concession from the rival. Therefore, despite witnessing the concession, that group is unlikely to adjust their enmity. To test the arguments, I use a novel panel survey data of South Koreans in 2018 and ICEWS data. Empirical evidence from the Korean case supports my theoretical propositions. South Korean conservatives are more likely to maintain the enemy images of North Korea despite witnessing the concessions of North Korea. The findings imply that, unlike the arguments of previous studies, reciprocated cooperation is at best a necessary but insufficient trigger for removing the negative image of the opponent. Thus, the proportion of cognitively inflexible citizens is likely an important component of the medium and long-term success of de-escalation.

Veronica Iriart
10-12noon, Poster Session 1
Herbicide drift reveals species-level variation for resistance, tolerance, and effects on flowering: community-level analysis reveals implications for pollinator resources
Anthropogenic stressors such as herbicide drift threaten the diversity and stability of ecological communities. Drift to nontarget plant communities could affect species differentially due to variation in resistance or tolerance. Moreover, if drift alters flowering phenology, it may affect both pollinator-mediated plant-plant interactions and pollinator food availability. Thus, understanding the effects of herbicide drift on plant communities at the agricultural-ecological interface is an important challenge for biodiversity conservation across kingdoms. Accordingly, we grew 25 species of herbaceous plants spanning 15 families that naturally co-occur near US agricultural fields in a common greenhouse environment. We treated the plants as seedlings with either a drift-level dose (~1% of the field application rate) of the widely used herbicide dicamba, which is often linked to drift, or a water and surfactant mixture as a control. We scored species’ initial stressor resistance and long-term tolerance as the difference between dicamba and control plants relative to the control in plant size at three-weeks post-treatment and final shoot biomass, respectively, and tested for significance using ANCOVAs with contrasts. We recorded the day of first flower and number of open flowers displayed for all plants, and used a network approach to characterize flowering phenology and assess community level effects of dicamba exposure by comparing network parameters between the drift and control communities. We found significant variation in initial stressor
resistance, ranging from high susceptibility to even overcompensation (range = -60% to +59% relative size change), as well as in long-term tolerance (-39% to +34% relative biomass change), and day of first flower (+47 to -11 days until first flower). None of these indices demonstrated significant phylogenetic signal, suggesting species-specific patterns were not constrained by evolutionary history. We also found that dicamba drift weakened average interaction strength between co-flowering species by 24% and altered the composition of co-flowering modules, i.e. the number and membership of subgroups of species potentially interacting. These results demonstrate that even very low levels of herbicide exposure can have significant impacts on plant communities, phenology, and floral resource patterns, thereby implicating changes in plant-pollinator interactions as agricultural intensification continues to rise.

Nathanael Joseph
1pm, Panel 2
The Economic Freedom Fighters and the Dynamics of Insurgent Practice in South Africa

The forced resignation of South African President Jacob Zuma by his own party, the ANC, marked a turning point in the country’s politics, one in which the ruling party recognized the need for realignment in the face of electoral decline and popular discontent. A significant factor in this process may have been the challenge posed by the Economic Freedom Fighters (EFF), a radical left opposition party formed in 2013. The EFF grew substantially in concordance with the decline of the ANC and the expulsion of Zuma. How and to what extent did the insurgent activity of the Economic Freedom Fighters (EFF) compel South African President Jacob Zuma to resign? Drawing on insurgent practice theory, I hypothesize that the insurgent practices of the EFF, particularly their disruptions of South African parliamentary procedure which through fiery rhetoric, specifically challenged Zuma and corruption in his administration from a left populist angle. Utilizing process tracing analysis of a wide range of documentary data, I find that the repression these actions faced drew support, particularly from third parties aiming to draw power from the ANC, which helped to sustain the EFF’s actions and drive their insurgency forward, while diminishing the credibility and electoral returns of the ANC, helping lead to a leadership crisis in the ruling party and Zuma’s expulsion.

Dave Klein
11am, Panel 3
The histone chaperone FACT is essential for maintenance of stem cell pluripotency

Among the most critical processes in organism development is the decision faced by embryonic stem cells: whether to retain the capacity to become any cell in the body (pluripotency), or to begin the process of differentiation into a specific cell type, such as a blood cell, a liver cell, or neural cell. This cell fate decision is highly regulated and essential for proper development; but how do cells know whether or not to begin differentiating? The answer is in their DNA. The mammalian FACT complex is a set of proteins that regulate compaction of DNA, or chromatin structure. The basic unit of chromatin is the nucleosome, composed of stretches of DNA compacted around histone proteins. FACT has an established role in clearing and reassembling nucleosomes to facilitate the conversion of DNA to RNA (transcription), as well as replication of DNA to prepare for cell division. Using rapid, inducible degradation of the FACT complex, we have identified a role for the complex in maintaining stem cell pluripotency. This role is likely fulfilled by maintenance of DNA accessibility at regions that are co-regulated by known master regulators of pluripotency. By analyzing FACT complex binding to DNA throughout the entire mouse embryonic stem cell genome, we have identified extensive co-regulation between these pluripotency-maintaining factors and the FACT complex. Further, upon depletion of the FACT complex, nucleosomes invade the region previously bound by FACT, thereby repressing expression of target, pluripotency-associated genes. We have further analyzed the direct effects of FACT depletion on gene expression by sequencing newly produced RNAs. We have found that transcription of genes involved in vasculature development, neural
development, and post-embryonic development are significantly upregulated following FACT depletion, confirming a role for FACT in preventing cellular differentiation.

Miroo Lee
1-3pm, Poster Session 2
Language Mode Effects on Bilinguals’ Speech Perception
Previous research suggests bilingual listeners’ sound perception can be affected by language mode (Elman et al., 1977; Grosjean, 1999; Bürki-Cohen, 1989), but it remains unclear how language mode is implemented. The current study asks (1) at which level (acoustic/perceptual vs. phonemic/linguistic) language mode effects arise and (2) how language mode affects acoustic cues that have different roles in each language. We tested Korean-English bilinguals’ sensitivity to the acoustic cues of voice onset time (VOT) and pitch (F0) during perception of both meaningless syllables and real words. In English, VOT is a primary cue to stop consonant voicing (e.g. the difference between [ba] and [pa]), but Korean relies on both VOT and F0 (Cho et al., 2002).

Two continua were created by manipulating a naturally produced [pa] sound: a VOT continuum from 0 to 60 ms and an F0 continuum from 200 to 260 Hz. Participants (n=22 late bilinguals; n=10 monolinguals) completed three listening tasks: a labeling task (“Is this sound [ba] or [pa]?”), a syllable discrimination task (“Are these sounds the same or different?”), and a word discrimination task (“Are these words the same or different?”). Language mode was manipulated across two separate days: both groups completed an English session followed by a Korean session. Critically, the same continua were used throughout, so any differences across tasks must be attributed to some aspect of the listening mode.

Preliminary analyses indicate language mode effects in all three tasks for the bilinguals. Reliance on F0 was stronger in L1 Korean than in L2 English, demonstrating that sensitivity to acoustic cues can be affected by language mode. This suggests that explicitly helping L2 learners develop different language modes may help them become more proficient listeners in the L2. The results also suggest that cognitive flexibility can be achieved by late L2 learners.

Key words: language mode, cognitive flexibility, speech perception, adult language learners, acoustic cue sensitivity

Marissa Lepper
2pm, Panel 1
It’s Not My Fault: Excuse-Seeking Behavior in the Intertemporal Domain
This experiment tests if people engage in excuse-seeking behavior to justify giving in to temptation. There are many situations where people are tempted to act in a way that benefits their current-self to the detriment of their future-self – even if they know they shouldn’t do so. However, if they can convince themselves that what they are doing isn’t actually bad, the current cost to act myopically is lowered. This study extends the self-control literature by identifying ex-ante excuse-seeking behavior: people who appear to care about their future-self in the absence of an excuse, but act differently, prioritizing their current-self, when an excuse is available. In this experiment, participants decide between allocations of tasks to do immediately and in the future. Some decisions involve uncertainty, which can be costlessly resolved. However, ambiguity can be exploited to justify doing less now. There is a 500% increase in participants picking the myopic option when an excuse is present. This effect is driven by the 37% of participants who opt not to resolve the uncertainty.
Yangqiuting Li
10am, Panel 2
How learning environment predicts male and female students' physics motivational beliefs in introductory physics courses

Students’ motivational beliefs about physics can influence their learning outcomes and choices of majors and careers. Moreover, due to societal stereotypes and biases about who belongs in physics and can succeed in physics, women often have lower motivational beliefs about physics than men. Investigating how the learning environment in introductory physics courses for the physical science and engineering majors in their first year of college further influences the motivational beliefs of women and men can play an important role in understanding women’s underrepresentation in these disciplines. In this study, we investigated the effect of learning environment (including perceived recognition, peer interaction and sense of belonging) on students’ physics self-efficacy, interest and identity by controlling for their self-efficacy and interest at the beginning of a calculus-based introductory physics course. We surveyed 1203 students, 35% of whom were women. We found that female students’ physics self-efficacy and interest were lower than male students’ at the beginning of the course, and the gender gaps in these motivational constructs became even larger by the end of the course. Analysis revealed that the decrease in students’ physics self-efficacy and interest were mediated by the learning environment and ultimately affected students’ physics identity. Our model shows that perceived recognition played a major role in explaining students’ physics identity, and students’ sense of belonging in physics played an important role in explaining the change in students’ physics self-efficacy. These findings can provide guidelines for creating an inclusive and equitable learning environment in which all students can excel.

Alison Mahoney
11am, Panel 1
Queer/Crip Intersections: Drag Syndrome’s Collective De/Politicization of Disability

In September 2019, London-based performance collective Drag Syndrome was scheduled to make their United States debut in Grand Rapids, Michigan as part of a disability art festival hosted by the local organization DisArt. In the weeks leading up to their performance, the venue owner, Peter Meijer (then a Republican congressional candidate who went on to win a seat in the House of Representatives) canceled their booking, publicly citing fears that the group of intellectually disabled performers, “whose ability to act of their own volition is unclear” were being sexually exploited by their nondisabled creative director, Daniel Vais, and by DisArt. DisArt found the troupe a new venue, and the queens and king of Drag Syndrome – Horrora Shebang, Gaia Callas, and Justin Bond – performed their American debut to two sold-out audiences amid protests, media frenzy, and a complaint filed by Michigan’s chapter of the American Civil Liberties Union (ACLU).

In this paper, I will examine media coverage of the Grand Rapids controversy along with Drag Syndrome’s responses to the venue cancellation, using these as opportunities through which to explore queer/crip intersections. Between Meijer’s response, online comments and protests from the Evangelical right, and the ACLU’s complaint, I argue that Drag Syndrome’s tour to Grand Rapids highlighted public anxieties about queer/crip performance and queer/crip identity more broadly. I engage with Alison Kafer’s political/relational model of disability to understand how Drag Syndrome poses a challenge to the apolitical framing of intellectual disability through the content they choose to perform and, more importantly, through their organizational structure. The group places significant value on their togetherness, exemplifying a model of collective, interdependent care that reimagines social structures, challenging notions of segregated, private spaces for disabled bodies and minds, and moving beyond queer familial structures to a crip/queer horizontality.
Katie Morrow
1-3pm, Poster Session 2

A major overlooked problem for the Ecosystem Services Argument for protecting biodiversity
Humans are currently accelerating the rate of species extinctions. In many of the best-studied taxa, a quarter or more species are estimated to be threatened with extinction. Most environmental thinkers agree that we should try to stop species losses, but philosophers have had trouble justifying this position. The “ecosystem services argument” for protecting biodiversity is one of the most popular arguments. The argument states: biodiversity is needed to support ecosystem functions or services; it would be bad for human wellbeing if ecosystem functions or services were lost; so, we should protect biodiversity. Although this argument sounds compelling, it suffers from serious problems. The problem I develop is a general issue with the form of the argument which has been overlooked in the existing literature. I call this the “scaling-up problem.” This problem arises because protecting biodiversity is supposed to be a global project to stop species extinctions. However, the ecosystem services argument only claims that local ecosystem services are supported by local biodiversity levels. This argument can only support global biodiversity protection if global species losses contribute to local species losses. But this step in the argument lacks empirical justification, and has rarely even been discussed. Studies suggest that although global species richness is declining, local species richness has not been declining, likely a result of species introductions offsetting extinctions. As a result, the argument suffers from a scale mismatch, such that it cannot provide support for stopping extinctions at the global scale. I conclude that other reasons are needed to support stopping global species losses. Some potential other reasons include arguments based on intrinsic or aesthetic value, cultural heritage, scientific opportunity, or precautionary principles, although these arguments unfortunately also suffer from objections.

Ben Naismith
1pm, Panel 1

Finding the sweet spot: Learners’ productive knowledge of mid-frequency lexical items
Research into vocabulary knowledge often differentiates between breadth and depth (Anderson & Freebody, 1981), that is, how many words a person knows versus how well the words are known. Both theoretical categories are essential for understanding language learners’ lexical development. But to date, how the different aspects of vocabulary knowledge interconnect has not received the same attention as each individual dimension (Haomin & Bilü, 2017), especially in terms of productive knowledge (Mantyla & Huhta, 2014).

In the current study, lexis from the learner corpus PELIC (Juffs et al., 2020) is analyzed, specifically, mid-frequency lemmas in the K3-K9 frequency bands. Critically for learners, mastery of lexis in this frequency range is essential for achieving the English proficiency required for university study. From these mid-frequency items, a dataset of 7,174 tokens were collected from word families with multiple derivations and manually annotated. The findings show that compared to expert user texts in the Corpus of Contemporary American English (COCA; Davies, 2008-), learners overuse verb forms and underuse noun forms of these lexical items. Moreover, as expected, a strong correlation exists between collocational accuracy and derivational accuracy. These patterns provide evidence of the interplay between breadth and depth in learners’ productive vocabulary usage, suggesting that increased lexical depth will naturally lead to greater lexical breadth and vice versa. Pedagogical implications are discussed, reaffirming the importance of developing learners’ explicit morphological awareness (Ishikawa, 2019) and collocational accuracy (Crossley et al., 2015). Suggestions for mid-frequency lexical items to prioritize in language learning are also provided, with a view to helping learners achieve academic readiness.

Brianna Natale
Systemic inflammation contributes to the association between childhood socioeconomic disadvantage and midlife cardiometabolic risk

Childhood socioeconomic disadvantage is associated with greater risk for chronic inflammation and cardiometabolic disease at midlife. However, it is presently unknown whether inflammation mediates the relationship between childhood socioeconomic status (SES) and adulthood cardiometabolic risk. Here, we investigated associations between retrospectively reported childhood SES, circulating levels of inflammatory mediators, and a latent construct of cardiometabolic risk in midlife adults. Participants were 1,359 healthy adults aged 30 to 54 (Adult Health and Behavior (AHAB) cohorts I & II; 52% female, 17% Black) who retrospectively reported childhood SES via the Hollingshead Index (parental education, occupational grade). Measurements of circulating interleukin-6 (IL-6), C-reactive protein (CRP), and cardiovascular risk factors were also obtained. Analyses were conducted using structural equation modeling, in which cardiometabolic risk was modeled as a second-order latent variable with adiposity, dyslipidemia, insulin resistance, and blood pressure as first-order components.

As expected, lower childhood SES was associated with greater risk for cardiometabolic disease (β=-0.08, CI[-0.043,-0.005], p=0.011) and higher circulating levels of CRP (γ=-0.12, CI[-0.013,-0.005], p<0.001) and IL-6 (γ=-0.08, CI[-0.008,-0.001], p=0.007) at midlife independently of demographic covariates, although the associations with cardiometabolic risk and IL-6 were attenuated by adulthood SES and health behaviors. Findings also indicated that the relationship between childhood SES and adulthood cardiometabolic risk was partially explained by systemic inflammation, and in particular, by circulating levels of CRP (β=-0.04, CI[-0.020,-0.005], p=0.001). The current study provides initial evidence that systemic inflammation may contribute to socioeconomic disparities in cardiometabolic risk in midlife. Future work would benefit from prospective investigation of these relationships.

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Elaine Nguyen

Identifying the molecular determinants that drive the LARP1 interaction with 5' TOP mRNAs

Cells adapt to fluctuations in states of nutrient abundance through the careful modulation of gene expression. One example of regulation of gene expression occurs at the mRNA level, where RNA binding proteins (RBPs) coat the mRNA to mediate or repress translation through the recognition of sequence or structural elements within the untranslated regions (UTRs). La-related protein 1 (LARP1) is an evolutionarily conserved RBP that has been implicated in the stability and translational control of 5' TOP (5' terminal oligopyrimidine) mRNAs. This class of transcripts encodes all of the proteins that constitute the ribosome as well as other translation-related factors. Multiple lines of evidence support that the C-terminal DM15 region of LARP1 directly binds the 5' TOP motif to repress translation. Interestingly, the DM15 region alone binds 5' TOP targets to varying degrees, but the co-crystal structure with a representative TOP sequence does not reveal RNA-protein contacts that could explain its binding preferences outside of the invariant +1C. How does the DM15 bind 5' TOP mRNAs to varying degrees? I am dissecting this question using biochemical and structural techniques to define the RNA and protein features that are required for interaction. I found that this interaction is 5' TOP motif length-dependent and is likely dependent on structural context in the RNA. I have also solved the crystal structure of a homologous DM15 domain from Drosophila melanogaster to interrogate structural contributions that may confer binding plasticity. This work will elucidate the binding mechanism that underlies the translational regulation of a class of transcripts fundamental for life.

Kathryn Pataki
1-3pm, Poster Session 2

Legalizing Sex Work: The Mirage of Sex Worker Autonomy in The Netherlands
The brothel ban in the Netherlands was lifted in 2000. Since then, sex work has been established as a legal industry and occupation for sex workers. However, the strict regulation of the sex industry strips sex workers of their agency. Moreover, liberal and radical feminist theoretical interventions into the sex industry pay insufficient attention to the way sex workers’ experience their work within a legalized industry. In this study, I consider how the legalization of sex work has affected the autonomy of Dutch sex workers. By connecting with two sex workers’ rights organizations in Amsterdam, the Netherlands, I identified and interviewed six sex workers and others closely tied to sex workers’ rights. I find that feminist standpoint theory, which emphasizes the lived experiences of the individuals involved, is the most effective way to understand sex workers’ experiences. While autonomy remains a critical way of theorizing the sex industry, sex workers themselves need to be at the center of the discussion on how their autonomy functions. My interviews suggest that the stigma that sex workers face in society undermines their workplace autonomy. Through political initiatives geared towards the sex industry without sex workers’ interests in mind, the need for a double identity, and the narrative of sex workers as victims of sex trafficking, sex workers’ autonomy is constrained. This research also underscores the importance of taking care when collecting data on the sex industry due to strong social stigma experienced by sex workers.

Benjamin Patty

10-12noon, Poster Session 1

Elucidating a nucleosome-based network of non-coding RNA regulation in embryonic stem cells.
Coordination networks of gene regulatory elements drive protein-coding gene expression to determine the cellular state. In parallel, these elements drive the expression of non-protein coding RNAs referred to as enhancer RNAs (eRNAs) and promoter proximal transcripts (PROMPTs). Importantly, these and other classes of non-protein coding RNAs make up the majority of the transcription, conversion of DNA into RNA, within cells. Specifically transcription of non-protein coding RNAs accounts for nearly 98% of the total transcription within cells, while protein coding regions, those which have traditionally been the focus of biologists, account for only 2%. The functions of these transcripts remain controversial, but their positively correlated expression with gene regulatory network activity indicates important purpose. We recently found that BAF, one of 32 members from a family of protein complexes referred to as chromatin remodelers, acts as a specific repressor of eRNA and PROMPT expression; the first description of a factor globally responsible for regulating these transcripts. However, the full scale and diversity of chromatin remodeler interactions with eRNAs and PROMPTs has not been investigated. I hypothesize that a network of chromatin remodelers regulates eRNAs and PROMPTs expression genome wide. Using cutting-edge transcriptomic and genomic approaches, I am defining the members of this network and shedding light on their regulatory interactions with one another to manage eRNAs and PROMPTs. My research will define novel regulators of gene regulatory networks and non-coding RNAs. This work will improve our understanding of the maintenance of cellular state, which when disrupted, is the root of many genetic diseases.

Emily Roemer

10am, Panel 3

Object Engagement, Parent Labels, and Language: Dyadic Play in Toddlers at Elevated Likelihood of Autism
Toddlers develop in a complex social environment full of opportunities to learn from parental input. Parent speech during joint engagement is particularly important for language learning in children with Autism.
Spectrum Disorder (ASD; Bottema-Beutel et al., 2014). While difficulties with language are common for toddlers at elevated familial likelihood (EL) of ASD (Marrus et al., 2018), little work has examined parent input during object and joint engagement in relation to language development for EL toddlers. TL (typical likelihood; n=12) and EL (n=43) toddlers were observed during parent-child toy play at 12 and 18 months. Episodes of coordinated and supported joint engagement (i.e., joint engagement with and without eye contact) and object engagement were identified. Rates of parent labels were calculated across the observation and within engagement states. Language skill was measured at 24 and 36 months. EL infants were evaluated at 36 months and classified into three groups: EL-ASD (n=12), language delay without ASD (EL-LD, n=17), and no diagnosis (EL-ND, n=14).

EL toddlers spent more time in object engagement than TL peers at 12 months (p = 0.026), though this difference was attenuated by 18 months. Time in object engagement was negatively related to the rate of parent labels at 12 months (r = -0.374, p < 0.01). However, time spent in supported joint engagement was positively related to the rate of parent labels at 12 and 18 months (r’s =.569, .288; p’s < 0.05). While parent labels in object engagement and coordinated joint engagement positively predicted language for TL toddlers (ps < 0.01), labels were negatively related to language for EL-ASD toddlers across engagement states (ps < 0.05).

Marina Salnikova
1pm, Panel 2
A New Way of Publicity: Mediatization of Contemporary Paganism in Scandinavia
Various radical right-wing parties in Europe share an emphasis on ethno-nationalism, rooted in myths about a common European history as well as its cultural, linguistic, and genetic homogeneity. Several of these parties utilize contemporary Paganism to promote their ethno-nationalist agenda, advocate for racial segregation, and reinforce national identity. This paper examines how contemporary Pagan organizations are affected by the local/national politics or whether they support any local/national politics. By analyzing the official websites of contemporary Pagan communities, Facebook pages, and blogs, the paper argues that most officially recognized organizations do not have any connections or affiliations to any political organizations or parties. However, the members of various Neo-Nazi organizations, including Vígríðr, use contemporary Paganism as a tool to promote their racial ideology without being loyal adherents of contemporary Paganism.

Joshua Schneider
10am, Panel 3
Infant Walking Shapes Language and Gesture Input from Caregivers
The acquisition of new motor skills expands infants’ opportunities for social interactions with objects and people. Recently, researchers have turned their attention to understanding these processes as infants transition from crawling to walking. Here, we asked how the acquisition of walking shapes caregiver language and gesture input when infants move.

Thirty infants and their caregivers were videotaped in the home during everyday activities for approximately 45 minutes. We centered each infant’s observational window around the onset of walking (5 steps; M = 11.98 months, SD = 1.31) and coded the 2-month window around that midpoint. For each session, we identified all bouts of infant crawling and walking and coded caregiver language and gesture input during each bout. Language was categorized into utterances containing action verbs (‘go, get’) or object talk (‘That’s your blue crayon!’); and gesture as movement gestures (e.g., beckoning with arms or hands) or show gestures (e.g., holding objects in view).

Across the observation period, infants were twice as likely to hear language when they walked compared to when they crawled. Moreover, caregivers were 2-3 times as likely to use action verbs and nearly three times as likely to talk about objects when infants walked. Walking similarly shaped gesture input, such
that infants’ walking bouts were generally more likely to co-occur with caregiver gesture and specifically, with movement and show gestures. Taken together, these results indicate that the transition to walking triggers dramatic changes in the language and gesture input that caregivers produce, providing robust evidence for the presence of a developmental cascade. Findings will be discussed on two timescales: (1) in the moment-to-moment relations between infant action and caregiver input and (2) in developmental time across the motor transition to illustrate caregivers’ sensitivity to their infants’ developing skills.

Alex Silver
10am, Panel 3
Parental math talk is not uniformly beneficial for young children
Children’s early math skills vary considerably and are related to their later academic achievement (Duncan et al., 2007; Jordan et al., 2006). Recent work on the development of math abilities has stressed the importance of considering child-level propensities that are associated with children’s ability to learn and environmental opportunities that children are presented with in the home or school (Byrnes, 2020). In particular, past work has found that children’s own inhibitory control is strongly linked to their early math performance (Espy et al., 2004). Additionally, parental math engagement through math talk has also been found to be related to children’s early math performance (Levine et al., 2010; Elliott et al., 2017). However, no studies have explored the interaction between these propensity and opportunity factors in predicting early mathematics. Here, we examined whether children’s inhibitory control may moderate the association between parental math engagement and children’s math performance. Specifically, we investigated whether some children may benefit from parental math input more than others based on their inhibitory control. Parental math input via number talk during a 10-minute naturalistic free play session in the lab was measured in 123 children (Mage = 3.9 years; 59 girls) and one of their parents. We found that high levels of parent number talk were associated with higher math achievement only among children with higher inhibitory control. This association was not seen in children with lower inhibitory control, for children’s vocabulary as the outcome measure, or when parents’ overall talk was used as the measure of parental input. Thus, children may differentially benefit from parental math engagement depending on their cognitive abilities and this association is specific to parental talk about numbers and children’s math abilities.

Neil Silveus
1-3pm, Poster Session 2
Hell and the High School: 1920s Antievolution Policies and Demand for Public Schooling
How does censoring curriculum on controversial subject matter affect students’ education attainment? I study the American South during a wave of religiously motivated anti-evolution legislation in the 1920s. During this period of rapidly expanding high school enrollment, Protestants in the United States were embroiled in a culture war over biblical literalism. Using a difference-in-difference strategy and linked US Census Data, I find that student cohorts exposed to state laws restricting the teaching of evolution in public schools are more likely to attend and finish high school. These students are also more likely to be found in professional occupations in 1940, although there is no measurable impact on income. The results from this study will illuminate the relationship between religious affiliation and public-school enrollment during the American high school movement. This is especially important given the long history cultural battles fought in the classroom and religious sorting out of public high schools into home schooling and private schools.
Amanda Tien
1pm, Panel 1
Takeout and Uptake: An Analysis of Food as a Narrative and Cultural Device in Chinese American Novels
What can paying attention to the food tell us about Asian American fiction and, by extension, the lives of those communities? I posit that by exploring food in the immigrant genre, readers can crystallize a great understanding of the formation and transformation of the Asian American identity: the ebb and flow of assimilation, national pride, and evolving familial bonds.

I examine scenes from three novels: 1) The Joy Luck Club by Amy Tan (1989), 2) Hotel on the Corner of Bitter and Sweet by Jamie Ford (2009), and 3) How Much of These Hills is Gold by C. Pam Zhang (2020). All three are contemporary fiction that are by and about Chinese Americans. Within the texts, characters live in different significant times in history; the writers each come from a different generation and immigration wave, bringing with them distinct cultural heritages. On a meta level, each book was released at a different point in the nation's conversation with “diversity” stories and the publishing industry’s willingness to amplify voices of color.

In my paper, I provide a modest review of the historical and fundamental relationship between Asian America and food. From significant boons in agricultural and fishing production to restaurants, food was and continues to be a primary gateway for Chinese immigrants to build a life and a legacy in America. I tie this background in with my fiction discussion by analyzing dishes eaten, meals as a literary device, and the communal hunger for acceptance.

Food is not just an edible concoction. Food is nationality, and nationality is identity, and identity is power. Power defines who can live the life they want to live. And in the urgency and hunger of the American dream, that is everything.

Sharon Toth
11am, Panel 3
Community outreach initiatives: Using biological anthropology to promote science education
Scientific outreach initiatives are a necessary means for engaging the community with scientific knowledge while promoting critical thinking, hands-on problem solving, and scientific literacy inside and outside the classroom. The importance of the public having a generalized understanding and acceptance of basic scientific principles has been emphasized during the current ongoing COVID-19 pandemic. Many have dubbed the virus “fake news” and criticized the vaccine. This worldwide crisis highlights the need for more scientific engagement with local communities to deliver research and training outside university walls. Here I present how biological anthropology students at the University of Pittsburgh have participated in outreach programs to teach students (K-12) basic scientific anthropological principles. Some activities have included cadaver labs, International Archaeology Day, and forensic anthropology workshops. These activities used interactive demonstrations to teach topics such as osteology, bone development, anatomy, and scientific collaboration, all with the critical goal of increasing participant comprehension of the human body. Overall, these programs were well received by participants and cited as developing a stronger understanding of their own biology while also creating awareness of anthropological science. These types of initiatives are critical for community education and increased acceptance of scientific research.

Sarah Tripplehorn
Investigating the recruitment and function of the nucleosome remodeler Chd1

DNA is a highly protected biomolecule that stores the instructions for life. Stretches of DNA that encode genes are shielded from access within DNA-protein complexes termed nucleosomes, which form the basic repeating unit of chromatin. My goal is to understand how cells regulate access to DNA to accomplish transcription and manage nucleosome positioning. One protein of interest, Chd1, is a nucleosome remodeler that generates spaced arrays of nucleosomes across actively transcribed genomic regions, preventing transcription of aberrant RNA molecules. These functions of Chd1 are also critical in dictating the transcriptional landscape of embryonic stem cells, and Chd1 misfunction contributes to a large subset of prostate cancers. Importantly, much is unknown about how Chd1 arrives to chromatin to accomplish its remodeling functions and how these functions are regulated. In conjunction with some published evidence, my preliminary data suggest that Chd1 function and recruitment is regulated during transcription. One regulatory protein, Rtf1, travels with the polymerase on all active genes in the genome, functioning within a larger protein complex to control several key facets of transcription. I hypothesize that the Rtf1-Chd1 interaction functionally impacts Chd1 nucleosome remodeling activity, and that Rtf1 recruits Chd1 to transcribed genes, thereby coupling nucleosome remodeling to transcription. I anticipate that this Rtf1-Chd1 interaction not only has functional consequences in the organism in which it was discovered, budding yeast, but that it is also relevant in mammalian systems such as mice and humans. Using precise mutations in Rtf1, I intend to study the subsequent changes in Chd1 localization, transcriptional output, and nucleosome positioning across the entire genome that result from disruption of the Rtf1-Chd1 interaction. These studies will provide insight into how active transcription and chromatin structure function in a concerted effort to regulate transcriptional output.

Reed Van Schenck

Wacky Ideologies: The Memetic Circulation of the Political Compass

This essay tracks the genre of Political Compass Memes as a case study in the formation of online political identity. The Political Compass, a 2001 website that graphs the user's political ideology on economic and social scales, was taken up by users of 4chan as a meme in the early 2010s. Through my analysis of the meme's circulation, I argue that online political discourse operates through antagonism that subverts the rationalizable field of political identity but ultimately succumbs to the pressures of communicative capitalism. I demonstrate this conclusion through analysis of a sample of Political Compass Memes across popular social media platforms as well as a case study, the YouTuber Jreg, who uses the Political Compass to encourage “extremists” to unite antagonistically against the political center. I identify two functions of the Political Compass memetic genre that contribute to this trend: identity through negation and meta-irony. I find that, while the meme gives users a novel language to think about politics outside of the constraints of liberal rationalism, it also leaves room for the uptake and spread of reactionary ideas. This research encourages scholars to take seriously the elusive corners of the Internet to map the circulation of online political identification more faithfully.

Harsh Vashistha

Non-genetic inheritance restraint of cell to cell variation

Heterogeneity in physical and functional characteristics of cells (e.g. size, cycle time, growth rate, protein concentration) proliferates within an isogenic population due to stochasticity in intracellular biochemical processes and in the distribution of resources during divisions. Conversely, it is limited in part by the inheritance of cellular components between consecutive generations. Here we introduce a new experimental method for measuring proliferation of heterogeneity in bacterial cell characteristics, based
on measuring how two sister cells become different from each other over time. Our measurements provide the inheritance dynamics of different cellular properties, and the ‘inertia’ of cells to maintain these properties along time. We find that inheritance dynamics are property-specific, and can exhibit long-term memory (~10 generations) that works to restrain variation among cells. Our results can reveal mechanisms of non-genetic inheritance in bacteria and help understand how cells control their properties and heterogeneity within isogenic cell populations.

Yucheng Wang
10am, Panel 1
Public Transit Fares and Gasoline Consumption: Evidence from Beijing
Low-cost mass transit plays an essential role in commuting in modern cities and also discourages private automobile usage. Therefore, its pricing and subsidy strategy is crucial for policy-makers. However, the most crucial economic parameter in determining the pricing of the public transit, which is the commuters’ travel behavior in response to the price, is unfortunately under-explored in research. This study uses high-frequency transportation data and gasoline consumption data to examine how the large-scale increase in fares of the Beijing subway affects public transit ridership and private vehicle usage. I collect daily subway ridership data of each line in Beijing subway by web scraping. Furthermore, I obtain transaction-level gasoline sales data for all gas stations in Beijing from one of China's major gasoline retailers. To examine the price elasticity of demand for subways, I design a regression model that compares the subway ridership right before and after the increase of the fares. I also use a regression model that compares gasoline sales among gas stations of varying distances from the subway lines. I find that: (1) The fare increase leads to a 13.5% of reduction in subway ridership, which corresponds to prices elasticity of -0.117. (2) The fare increase leads to a 8.32% increase of gasoline sales for the gas stations closed to the subway lines. (3) The estimates are more prominent on weekends and holidays. (4) Most of the effects we observe derive from the short-run response within 30 days after the fares increase. In addition, I develop a simple conceptual framework to incorporate my estimations and conduct a back-of-the-envelope calculation for the optimal public transit price scheme.

Yunye Zhu
11am, Panel 3
Determination of Pol II transcription start site sequence specificity in *Saccharomyces cerevisiae* using massive promoter variant libraries
Eukaryotic protein-coding genes are transcribed by RNA polymerase II (Pol II), which is highly conserved in structure. As the first step of transcription, initiation determines where and how efficiently transcription initiates and therefore is a key component of gene expression. Genome-wide data suggest that transcription start site (TSS) sequence and its sequence context are determinants for the initiation output and further suggest that changes to factors involved in the TSS identification affect the initiation output. However, previous studies examining TSS specificity were based on existing gene promoters *in vivo*, thus are subject to bias and context limitation in those promoters. To comprehensively determine TSS sequence specificity and Pol II catalytic mutants effects on TSS identification, we investigated over 60,000 systematically designed DNA sequence variants under wildtype or mutated Pol II conditions. We find that Pol II shows distinct sequence preference at positions around TSS. Comparison between Pol II wildtype and mutant libraries suggests that Pol II mutants change overall efficiency for positions around TSS but at different levels for the actual initiating site. Furthermore, we identify novel interactions between different positions, which can be observed in genome data. Finally, we built predictive and interpretable models for TSS efficiency from DNA sequence alone that predict over 85% measured TSS efficiency variability. Taken together, our results extend our understanding of transcription initiation mechanisms in yeast, and provide an adaptive method for other organisms to comprehensively study Pol II initiation.