

17TH ANNUAL
UNIVERSITY OF PITTSBURGH
KENNETH P. DIETRICH SCHOOL
OF ARTS AND SCIENCES

Grad Expo

Sponsored by:
Office of the Provost and the
Dietrich School of Arts and
Sciences

Organized by:
Arts and Sciences Graduate
Student Organization (A&S GSO)

WELCOME TO THE 17TH ANNUAL ARTS AND SCIENCES GRAD EXPO

We would especially like to thank William Kepler Whiteford Professor and Vice Provost for Research Mark S. Redfern and Provost and Senior Vice Chancellor Patricia E. Beeson. From the Kenneth P. Dietrich School of Arts and Sciences, we thank the Bettye J. and Ralph E. Bailey Dean of Arts and Sciences, N. John Cooper; Associate Dean for Graduate Studies and Research Kathleen Blee; and Assistant Dean Tara Meyer. 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 Dietrich School, for supporting the marketing and advertising efforts for this year's Expo. Thanks also to the Department of Communications Services for its hard work in coordinating the creation of the wonderful printed materials. The Grad Expo 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. 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 2017 Grad Expo Committee
Allison Gremba, Anthropology, A&S GSO
administrative assistant, cochair
Hety Wong, Music, cochair
Amy Karabowicz, Anthropology
Alicia Grosso, Anthropology

SCHEDULE OF EVENTS

9:30 a.m.–2:05 p.m.

Check in—all day, William Pitt Union (WPU), Room 527

9:45 a.m.

Podium presentations, Room 538

Podium presentations, Room 539

10 a.m.

Poster presentations, Room 540

11 a.m.

Podium presentations, Room 538

Podium presentations, Room 539

Poster presentations, Room 540

Noon

Lunch, Room 527

12:15 p.m.

Podium presentations, Room 538

Podium presentations, Room 539

1 p.m.

Podium presentations, Room 539

1:15 p.m.

Podium presentations, Room 538

2:15 p.m.

Podium presentations, Room 527

Podium presentations, Room 538

Podium presentations, Room 539

3:30–4:30 p.m.

Roundtable Discussion and Workshop, Room 527

The Nuts and Bolts of Applying for Grants

5–7 p.m.

Reception

Bridges Restaurant, Wyndham Hotel

100 Lytton Ave., Pittsburgh, PA 15213

ROUNDTABLE DISCUSSION AND WORKSHOP:

The Nuts and Bolts of Applying for Grants

3:30 p.m., Room 527 William Pitt Union

Hosted by Tara Meyer, Assistant Dean for Graduate Studies and Research

Featuring Laura Kingsley, MPH, CRA, Senior Associate Director, University of Pittsburgh Office of Research

Besides writing the proposal, what else is required to submit a grant at a university? There is an array of resources available to help new investigators navigate the grant submission process. This session will describe how to submit a grant at a university and tips for new investigators submitting a grant for the first time. Students are welcome to bring their own questions to this interactive session.

PAPER PRESENTATIONS

9:45 A.M., Room 538

Emily Braham, *Improving Young Children's Math Skills Through Guided Parent-Child Interactions in Museums*

Rosalind Elliott, *Parental Coping Socialization and Anxious Early Adolescents' Neural and Real-World Responses to Threat*

Ashley Sherman, *Depictions of Race and Gender in the Film Chicago (2002)*

Zhaohong Wu, *Second Language Processing of English Derived Words: Effects of Differences in L1 Typology, Morphological Awareness, Orthographic Awareness, and L2 Proficiency*

Room 539

Mathew Tembo, *After the Show, Both the Performer and the Listener Need Dialogue*

Adriana Miramontes, *The University Art Gallery as an Art History Classroom*

Courtney Colligan, *Frailty, Thy Name is Human: Gender Fluidity and the Family in Sarah Frankcom's Hamlet*

Matthew Hadodo, *Large Difference/Little Difference: Istanbul Greek [t̪] and Language Ideologies*

11 A.M., Room 538

Karen Jakubowski, *Associations Between Cumulative Childhood Adversity and Cardiometabolic Disease and Mortality: A Meta-Analysis*

Felipe Augusto de Araujo, *Cursed Through Time: Dynamic Adverse Selection in the Laboratory*

Jeffrey Girard, *Large-scale Observational Evidence of Cross-Cultural Differences in Smiling*

Woodrow Steinken, *Reconsidering Alban Berg's Intellectual History: The Invented Interiority of the Lyric Suite*

Room 539

Ling-Wan Chen, *Cumulative Incidence Regression for Dynamic Treatment Regimes*

Rebecca Emery, *The Relationship Between Impulsivity and Body Mass Index Depends on How Impulsivity is Measured: Findings from a Comprehensive Meta-Analysis*

Jacob P. Neal, *How to Stop Worrying About Model Microfoundationality: Lessons from Multiscale Cancer Modeling*

Dong Ju Lee, *Refugees vs. Immigrants vs. Net Migration: Which Inflicts Economic Costs?*

12:15 P.M., Room 538

Leanne Elliott, *Understanding Sources of Individual Variability in Parents' Number Talk with Young Children*

Farrah Neumann, *Vowel Harmony in Peninsular Varieties of Spanish: The Morphology-Phonology Interface*

Laura Schwartz, *A Demanding Power of Interiority: Performers as Justifications of Music's Value in Verbally Notated Compositions of the Early 1990s to the Mid-2000s*

Room 539

David Colaco, *Technique-Driven Research*

Scott Crawford, *Using Ligand Chemistry to Control Nanoscale Electronic Properties for Energy Transfer Applications*

Ali Pakzad, *Turbulence*

1 P.M., Room 539

Kathleen Creel, *Incompressible Patterns: Dennett vs. CRISPR Josh Fry, Kant and Frege on Logical Generality*

Charmgil Hong, *Detecting Unusual Input-Output Associations in Multivariate Conditional Data*

Domonkos Vamossy, *An Event Study of Investor Sentiment*

1:15 P.M., Room 538

Matthew Blair, *The Continuum of Female Agency in Perceval, the Story of the Grail*

Steven Moon, *On the Ethics of Gender-Based Fieldwork*

Shane Redman, *Effects of Same-Sex Legislation on Attitudes Toward Homosexuals*

2:15 P.M., Room 538

Jamie Amemiya, *Keep Calm and Carry On? African American Adolescents' Academic Coping in Context*

PAPER PRESENTATIONS CONTINUED

Sijie Li, *Immigration and Economic Well-Being: Evidence from the Great Migration*

Diego Villada, *Swimming in Quindío, Columbia's RECUCA*

Room 539

Siska De Baerdemaeker, *Natural Experiments in Cosmology*

John Kennedy, *Confronting History and Genocide: The Guatemalan Archive and Central American Postmodernity*

Farrah Neumann, *Acquisition of Variable Commands in L1 and L2 Spanish: Examining Imperatives and Optatives*

Room 527

Adeetee Bhide, *Orthographic Support to Aid the Learning of Non-native Phonemic Contrasts*

Alana DeLoge, *Language and Culture Contact in Cochabamba, Bolivia: The Case of a Veces*

Codee Spinner, *Music, Suffrage, and Domesticity: Music's Role in the Lives of Progressive Era Women in the United States, 1900–1920*

Ning Zhang, *Does Sophie's Choice Weaken Reverse Altruism?*

POSTER PRESENTATIONS

10 A.M., Room 540

Poster 1

Hope Brooks, *Delving into the 'Disturbance Matrix': Landscape Disturbance Increases Plant Diversity in Temperate Forests*

Poster 2

Kathryn Johnston, *The Effect of Chemical Environment on Silver Ion Release from Silver Nanoparticles*

Poster 3

Angela Mullins, *Geochemical Response of Roadside Infiltration Trenches to Seasonal Changes in Pittsburgh, Pa., and Implications for Chemical Flux*

Poster 4

Sharon Toth, *Discerning the "At-Risk" Factors of Cruciate Cranial Ligament Rupture in Dogs*

Poster 5

Kelly George, *A Systematic Approach Toward the Design of Structures that Mimic the Complex Folds and Functions of Natural Biomolecules*

Poster 6

Karen Jakubowski, *Technology-Assisted Cognitive-Behavioral Therapy Intervention for End-Stage Kidney Disease: A Pilot Study*

Poster 7

Sarah Smith, *From Signal to Shape: Investigating How Alterations to Signaling Pathway Activity Generates Newly Evolved Morphology*

Poster 8

Jillian Weeks, *Modeling Behavioral Mechanisms Underlying Increased Smoking in Schizophrenia*

Poster 9

Rebecca Forgrave, *Quantifying Urban Atmospheric Nitrogen Deposition with Ion Exchange Resins*

Poster 10

Kimberly Kowallis, *The Role of a Cell-fate Determining Protein in Bacterial Decision Making*

Poster 11

Emily Roemer, *Examining the Relationship Between Gesture and Language Development in Infant Siblings of Children with Autism Spectrum Disorder*

Poster 12

Jenna Zalewski, *Structural Insights into the Shroom-Rock Interaction*

11 A.M., Room 540

Poster 1

King Yee Gan, *Metallicity, Carrier Density, and Structural Evolution in Plasmonic Copper Selenide Nanoparticles*

Poster 2

Timothy Coleman, *Quantifying the Relationship Between Maximum Temperature and Tree Swallow Migration in the Eastern United States*

Poster 3

Rebecca Tisherman, *The Rate of Urbanization and Variation in Impacts to Sediment in Fluvial Systems*

Poster 4

Melissa Yang, *Project Pigeon[hole] – Marginal Animal I Craft Material*

Poster 5

Humair Bin Md Omer, *Computational Study of Ni-Catalyzed C–H Functionalization: Revealing Factors that Control the Competition of Oxidative Addition and Radical Pathways*

Poster 6

Angela Chung, *Characterization of Reactive Nitrogen Transport in Pittsburgh's Three Rivers*

Poster 7

Nicole Forrester, *Plant Polyploidy Improves Host Benefit from the Legume-Rhizobia Mutualism*

Poster 8

Michael Rerick, *Improvements to In Vivo Monitoring of Neurotransmitters Using Online Capillary High Performance Liquid Chromatography with Electrochemical Detection*

Poster 9

Marja Copeland, *Effect of Road Networks on the Geomorphology of Urban Watersheds*

Poster 10

Allison Gremba, *Measuring Digit Ratios from 2D Hand Scans versus Negative Handprints: Implications for Archeology*

Poster 11

Cass Lowry, *The Morphosyntax of Georgian Heritage Language Speakers: A Developmental Analysis of Narratives*

Poster 12

Rebecca Walsh, *Cold or Caring? How Do People Respond to the Threat of a Romantic Rival?*

Poster 13

Andrea Fetters, *Exploring the Possible Link Between Urban Gardens and Wild Remnant Plant Populations*

Poster 14

Steph McCabe, *Eight-Step Enantioselective Total Synthesis of (–)-Cycloclavine*

ABSTRACTS *(In alphabetical order)*

Amemiya, Jamie

Room 538, 2:15–3pm

Keep Calm and Carry On? African American Adolescents' Academic Coping in Context

This study sampled 274 African American seventh graders (55% female; 91% low-income) to examine how adolescents' reported use of five academic coping strategies following academic failures—strategizing, self-encouragement, commitment, help seeking, and comfort seeking—related to changes in academic achievement (i.e., grade point average) from sixth to seventh grade. Analyses considered how adolescents' gender and perceptions of school climate (i.e., school mastery goal structure and support for cultural pluralism) moderated the relation between academic coping strategies and achievement. Results indicated that strategizing helped males catch up to their female peers. Self-encouragement predicted increases in achievement for male students who perceived high support for cultural pluralism. Finally, commitment and comfort seeking generally predicted decreases in achievement, particularly for adolescents who perceived unsupportive school climates. Taken together, results indicate the importance of considering context—both school and sociocultural—in understanding how students effectively re-engage in their learning.

Augusto de Araujo, Felipe

Room 538, 11 a.m.–noon

Cursed Through Time: Dynamic Adverse Selection in the Laboratory

Human subjects across a variety of contexts exhibit a failure to understand the interaction of private information and strategy, with one prominent example being the winner's curse. Failures for Bayesian equilibrium have generally been in static games, where introspective subjects are required to think through a future hypothetical event. We use a laboratory experiment to examine a common-value matching environment where strategic thinking is entirely backward looking, where adverse selection is a dynamic, non-stationary process. Our results indicate the majority of subjects in our environment are cursed across time, using a sub-optimal stationary response—even after extended experience and feedback. While subjects do learn that the environment leads to adverse selection, and adjust their stationary response, only a minority adopt non-stationary responses.

Bhide, Adeetee

Room 527, 2:15–3:15 p.m.

Orthographic Support to Aid the Learning of Non-native Phonemic Contrasts

A difficult component of second language learning is learning non-native phonemic contrasts. Here, we compare three methods

of teaching English-speaking participants to discriminate three pairs Marathi phonemes (*/k/ and /kh/, /ɟ/ and /t/, /d/ and /dʱ/*). The pairs of phonemes encompass allophonic variation in English, but represent separate phonemes in Marathi. Specifically, we examine how orthographic support can affect phonological learning. We compare three orthographic conditions: Marathi orthography, English transliterations, and no orthography. Orthography may benefit learning because orthography serves as a label that aids categorization. The English transliterations may be beneficial because they are familiar to the participants and hence easier to process than the Marathi graphs. However, because participants already associate the English graphs with their English pronunciations, they may find it difficult to map the graphs onto new phonological referents. We found that participants in all three orthographic conditions learned the phonemic contrasts equally well, but orthography did help participants remember which phonemes were in certain vocabulary words. We did not find a difference between the two orthographic conditions. We also collected data about participants' auditory discrimination thresholds and English phonological awareness. We found that both skills predicted participants' ability to learn the contrasts. This research sheds light on sources of individual differences in foreign language learning and best practices for teaching pronunciation.

Bin Md Omer, Humair

Room 540, 11 a.m.–noon

Computational Study of Ni-Catalyzed C–H Functionalization: Revealing Factors that Control the Competition of Oxidative Addition and Radical Pathways

The mechanisms of Ni-catalyzed C–H arylation, alkylation, and sulfenylation with N,N-bidentate directing groups are investigated using density functional theory (DFT) calculations. While the C–H cleavage occurs via the concerted metalation-deprotonation (CMD) mechanism for all types of reactions, the subsequent C–C and C–S bond formation steps may favor either oxidative addition to form a Ni(IV) intermediate or radical (homolytic dissociation) pathways involving Ni(III). The DFT calculations reveal that the homolytic dissociation mechanism is preferred in reactions with sterically-hindered coupling partners with relatively low bond dissociation energies (BDE) such as dicumyl peroxide, heptafluoroisopropyl iodide and diphenyl disulfide. In contrast, the homolytic dissociation pathway is highly disfavored when such radical processes involve generation of unstable phenyl and primary alkyl radicals. In such cases, the reaction proceeds via an oxidative addition/reductive elimination mechanism involving a Ni(IV) intermediate. These theoretical insights into the substrate-controlled mechanisms in the C–H functionalization were employed to investigate a number of experimental phenomena including substituent effects on reactivity, chemo-

and regioselectivity. Also, such computational understandings led us to investigate novel types of Ni-catalyzed functionalization reactions.

Blair, Matthew

Room 538, 1:15–2 p.m.

The Continuum of Female Agency in Perceval, the Story of the Grail

In her 1985 book titled *Between Men*, Eve Sedgwick provides a theoretical framework for studying the crucial role of male homosocial desire in the perpetuation and transmission of normative male domination. Her elaboration of René Girard's conceptualization of erotic love triangles places them within the asymmetrically gendered domain of patriarchy. By participating in triangulated relationships, women help to facilitate male homosocial relationships by serving as objects of exchange. However, women are clearly not always reduced to servitude and complicity within the patriarchal order. Their ambiguous social status allows a certain level of negotiation of the borders between object and subject. Thus, female characters may deconstruct the textual tradition of male-dominated triangular relationships by becoming subjects capable of affecting change. One particular manifestation of such female agency can be found in Chrétien de Troyes' late 12th-century romance poem, *Perceval, the Story of the Grail*. Female characters in the story have varying levels of agency, with the same woman often oscillating between drastically different levels of power. For example, Perceval's mother is a character who draws agency from her maternal authority and religious instruction. However, her female instruction in the ways of proper chivalrous conduct are explicitly coded as inferior to the male instruction of knights. In this paper, I argue how the female characters in *Perceval* help to perpetuate the structures of medieval masculinity by operating on a continuum of autonomy as depicted by the actions and experiences of two characters: Perceval's mother and the Male Pucelle (the Evil Maiden).

Braham, Emily

Room 538, 9:45–10:45 a.m.

Improving Young Children's Math Skills Through Guided Parent-Child Interactions in Museums

Before entering kindergarten, children can learn important number concepts organically through play with their caregivers. However, not all children are given enough of these types of early learning opportunities. In our study, we examine if simple prompts can lead to number rich parent-child interactions, and whether such interactions improve children's attention to numbers, which is a strong predictor of their later success in math. We asked 58 preschoolers to play in a museum's mock grocery store with their parent. The parents received either a) Budget prompt cards, that

encouraged them to help their child shop for a meal using a list of prices, or b) Healthy Eating prompt cards, that encouraged them to help their child shop for a meal using information about food groups. Compared to parents in the Healthy Eating group, parents in the Budget group used number words more frequently during play (e.g., "You have three oranges. That's six dollars."), in turn, giving their children more opportunities to use number language. Before and after playing, all children completed a stamping game designed to assess their level of attention to numbers. Children who used number language more frequently during the parent-child grocery store interaction paid more attention to numbers during the stamping game afterwards. In sum, giving parents different prompts in a museum can lead to different learning experiences for their children. This study can assist children's museum educators in crafting materials for effective, play-based learning that boosts children's openness and attentiveness to math concepts.

Brooks, Hope

Room 540, 10–11 a.m.

Delving into the 'Disturbance Matrix': Landscape Disturbance Increases Plant Diversity in Temperate Forests

Contemporary eastern deciduous forests consist of homogenous, low-diversity plant assemblages. There is evidence that pervasive deer browsing and altered disturbance mechanisms, including shrinking canopy gaps and reduced fire frequencies, are driving the homogenization of forest plant communities. While previous studies have examined the impact of forest disturbances and browsing by deer at the plot level, few studies have focused on the effect of disturbance and browsers at the landscape level. We examine whether reduced levels of deer browsing and historical disturbances, including large canopy gaps and surface forest fires, will foster more diverse plant communities. We hypothesize that disturbances and reduced deer browsing increase plant diversity at the landscape scale and that these changes may not be apparent at the plot level. We tested these hypotheses by conducting meander surveys and recording species richness in 400 m² unmanipulated forest plots and forest plots manipulated to restore large canopy gaps (size = 255 m²), understory fires, and reduced deer browsing.

We aggregated measures of species richness from the plot level to compare species richness at the plot and landscape level. Plot level species richness was higher under reduced deer browsing and historical disturbance conditions, with 11 more species within disturbed sites. Landscape level species richness was also higher under reduced deer browsing and historical disturbance, with 25 more species recorded in disturbed sites. Our findings indicate that plot-based sampling approaches may underestimate the importance of historical disturbance regimes and reduced

ABSTRACTS *(In alphabetical order)*

deer browsing on maintenance of forest diversity.

Chen, Ling-Wan

Room 539, 11 a.m.–noon

Cumulative Incidence Regression for Dynamic Treatment Regimes

Recently dynamic treatment regimens (DTRs) have drawn considerable attention, as an effective tool for personalizing medicine. Sequential Multiple Assignment Randomized Trials (SMARTs) are often used to gather data for making inference on DTRs. In this paper, we focus on regression analysis of DTRs from a two-stage SMART for competing-risk censored outcomes based on cumulative incidence functions (CIFs). Even though there are extensive works on the regression problem for DTRs, no research has been done on modeling the CIF for SMART trials. We extend existing CIF regression models to handle covariate effects for DTRs. Asymptotic properties are established for our proposed estimators. The models can be implemented using existing software by an augmented-data approximation. We show the improvement provided by our proposed methods by simulation, and illustrate its practical utility through an analysis of a SMART neuroblastoma study, where disease progression is subject to competing-risk censoring by death.

Chung, Angela

Room 540, 11 a.m.–noon

Characterization of Reactive Nitrogen Transport in Pittsburgh's Three Rivers

This study uses nitrate isotopes ($\delta^{15}\text{N-NO}_3^-$, $\delta^{18}\text{O-NO}_3^-$, $\Delta^{17}\text{O-NO}_3^-$) to examine the sources of nitrate in Pittsburgh's three-rivers area for the first time. Human activity has greatly altered the global nitrogen cycle. Dual nitrate stable isotopes ($\delta^{15}\text{N-NO}_3^-$ and $\delta^{18}\text{O-NO}_3^-$) can trace nitrate sources to wastewater, fertilizer, and atmospheric deposition in aquatic environments, while $\Delta^{17}\text{O-NO}_3^-$ gives indication of whether deposited atmospheric nitrate was biologically processed. Sampling campaigns were conducted in Pittsburgh's three rivers. The samples were then prepared and analyzed in an isotope ratio mass spectrometer. During each sampling campaign, a submersible ultraviolet nitrate analyzer was also deployed for continuous measurements of nitrate concentrations in the rivers. Nitrate concentrations during baseflow and stormflow conditions are compared. The measurements and corresponding GPS locations are also used to create maps of nitrate concentration in Pittsburgh's three rivers.

Pittsburgh's three-rivers area is unique in that it's the confluence of the Allegheny and the Monongahela Rivers, which form the Ohio River and then flows to the Mississippi River. Pittsburgh is also an area with high quantities of combined sewage outfalls, which is a system of pipes that collects wastewater from domestic,

industrial, and commercial sewage. If precipitation exceeds the system's capacity, they are designed to overflow and discharge directly to surface waters. Preliminary results indicate that sewage represents the highest contributor of nitrate. This study determines the relative contributions of nitrate sources in Pittsburgh's three rivers watershed as well as the processes nitrate undergoes during transport.

Colaco, David

Room 539, 12:15–1 p.m.

Technique-Driven Research

Historians and philosophers of science have sought to characterize experimental research that is not driven by the evaluation of theory, but instead is focused on exploration. Along these lines, I discuss how techniques can drive research and allow scientists to explore systems. I describe the preparation technique CLARITY, which drives cutting-edge microscopy research in neuroscience. Though technique-driven research is exploratory and experimental, it fails to satisfy the conditions of several popular accounts of exploratory experimentation. In light of this discrepancy, I critically assess these accounts, and reappraise what conditions are necessary for exploratory research.

Coleman, Timothy

Room 540, 11 a.m.–noon

Quantifying the Relationship Between Maximum Temperature and Tree Swallow Migration in the Eastern United States

Species migratory patterns have typically been studied through individual observations and historical records. In this work, we adopt a data-driven approach to modelling the presence of the North American Tree Swallow (*Tachycineta bicolor*) throughout the eastern United States, using data collected through the eBird project at Cornell University's Lab of Ornithology. Our approach enables detection of changing patterns in departure date due to changing environmental conditions, such as habitat loss and shifting temperatures. Preliminary models suggest a difference Tree Swallow in abundance related to the maximum temperature, and this finding is further supported by more advanced learning-based approaches. In particular, partial effects calculated from random forests suggest that once temperature dips below a given threshold related to local insect abundance, Tree Swallow occurrence is likely to also take a sharp decline. To formally evaluate the significance of this effect, two separate random forest models are then trained and tested on the data, one with maximum temperature as collected, and another with the values randomly permuted. The difference in these predictions can be shown to be asymptotically normal U-statistics, allowing for construction of approximate confidence intervals and test statistics.

Colligan, Courtney

Room 539, 9:45–10:45 a.m.

Frailty, Thy Name is Human: Gender Fluidity and the Family in Sarah Frankcom's Hamlet

If all the world's a stage, then the men and women cannot be all of the only players, as these binary terms exclude many would-be players. The terms “man” and “woman” inevitably assert the notion of being cisgendered and sexually male and female, respectively. These limited identities exclude those outside of these binary labels and negate the possibility of other orientations. The duality between gender and identity in Shakespeare began with strictly male companies, yet directors are now flipping this practice with women performing male roles. In 2014, Sarah Frankcom directed *Hamlet* with female actress Maxine Peake as the Danish prince. With the societal construction of gender via Judith Butler and Elizabeth Klett's dramaturgical exploration of cross-gender performances, I use Maxine Peake's performance as *Hamlet* to argue that the performative success of both male and females portraying the Danish Prince are contingent on textual evidence and of our fluid understanding of gender norms. Peake's performance resonates due to her gender fluid portrayal and slight manipulation of the script and of the directorial choice to switch Polonius to Polonia. As Shakespeare's plays continue to resound with audiences, the ability to manipulate and reinterpret productions of these works remains as relevant as ever. How can the strongest piece in the Western canon remain so timeless? The answer may lie within our understanding of gendered norms and the performance of these norms in family roles.

Copeland, Marja

Room 540, 11 a.m.–noon

Effect of Road Networks on the Geomorphology of Urban Watersheds

Road networks have become a defining characteristic of urbanized regions. Continued growth of road networks increases their intersections with surface waters (e.g., bridges, fords) and can lead to impairments associated with these intersections. However, the geomorphological implications of road networks are poorly characterized. Here, we analyze a comparative set of urban watersheds in Pittsburgh, Pa, and control catchments in surrounding areas to quantify the patterns of road and stream crossings and their influence on the longitudinal profiles of the drainage networks. Preliminary results indicate that there are clearly detectable influences on the longitudinal profile that likely influence patterns of urban sediment transport and riparian biogeochemistry. These results clarify important controls on urban fluvial geomorphology with fundamental implications for effective treatments of the “urban stream syndrome.”

Crawford, Scott

Room 539, 12:15–1 p.m.

Using Ligand Chemistry to Control Nanoscale Electronic Properties for Energy Transfer Applications

Nanoparticles show tremendous promise in critical applications ranging from alternative energy production to cancer therapy. However, barriers remain in our fundamental understanding of their underlying physical and chemical properties, which has hindered their widespread manufacturing and use in everyday products. In particular, the ability to probe and control nanoscale electronic properties will enable the rational design of nanoparticles for specific applications, an essential step towards mass production. Here, the electronic properties of 1.8 nm gold nanoparticles are analyzed using photoluminescence spectroscopy, which measures the energy of light released by the gold nanoparticles following exposure to high-energy light. These experiments reveal that the electronic properties of gold nanoparticles at this size range can be tuned by very simple changes to the structure of the nanoparticle capping ligand (molecules that attach to the particle surface to provide stability). This relationship between the gold nanoparticle surface chemistry and corresponding photoluminescent properties is used to rationally design gold nanoparticles capable of transferring energy to other interesting chemicals in solution, such as the lanthanide element ytterbium, an important element for applications such as sensing and bioimaging. These experiments demonstrate that surface chemistry is a powerful tool that can be exploited for the development of high-performance materials.

Creel, Kathleen

Room 539, 1–2 p.m.

Incompressible Patterns: Dennett vs. CRISPR

Dennett's classic paper defines “Real Patterns” as present in data if “there is a description of the data that is more efficient than the bit map, whether or not anyone can concoct it.” (Dennett 1991, 34) However, compressibility is not the right criterion for pattern realism. A better pattern ontology is one based on informational relationships between the pattern and the perceiver of the pattern, whether human, biological, or machine.

A simple compression algorithm, such as Huffman coding, should be perfect for Dennett's purposes. Instead, Huffman coding illustrates the problem with compression as a metric: generalizability. If the algorithm were only used once, it could compress a novel into one character. But in order to read the novel on the other side, we would have to send the algorithm and the whole novel: no informational savings at all. What makes compression work is that the “cost” of the compression algorithm is amortized over many uses.

ABSTRACTS *(In alphabetical order)*

Further, any discrete chunk of randomness can be recognized as a pattern if it has the right informational relationship with its recognizer. Such recognition relationships between random sequences and detectors occur in our genetic material. New tools for genetic manipulation such as CRISPR use RNA's ability to recognize sequences of base pairs in order to snip and replace precise segments of DNA. The sequences can be recognized because of their relationship with the RNA's sequence. Using similar examples, I suggest that we should think of patterns as representing the informational relationship between pattern and recognizer.

De Baerdemaeker, Siska

Room 539, 2:15–3 p.m.

Natural Experiments in Cosmology

In standard accounts, cosmological hypotheses are almost invariably offered as paradigm cases of historical scientific research, along with evolutionary biology, paleontology, and geology. These historical cases are contrasted with a list of experimental hypotheses from disciplines like particle physics (with CERN as its experimental culmination), nanoscience or molecular biology.

The distinction between historical and experimental science is not just used descriptively: experimental science is supposedly epistemically superior to historical science. One argument that appears in the literature defending this view is 'the argument from hypothesis testing.' This relies on the assumption that manipulative experiments are at the top of the hierarchy of reliable methods ('manipulative experiments as the gold standard').

This paper rejects the claim that historical science is systematically at an epistemic disadvantage compared to experimental science. In particular, I use a case study from cosmology (the discovery of the accelerating expansion of the universe) to show that natural experiments—a specific type of observational study—can fulfill the role of manipulative experiments. This case-study and the general conclusions I draw from it, refute the idea of 'manipulative experiments as the gold standard', and therefore undermines a central premise in the argument from hypothesis-testing.

DeLoge, Alana

Room 527, 2:15–3:15 p.m.

Language and Culture Contact in Cochabamba, Bolivia: The Case of a Veces

In the midst of dramatic political and social change, indigenous women in Bolivia utilize various linguistic resources to make a place for themselves socially and actively participate in and construct new social realities. The qualitative analysis presented in this paper demonstrates how bilingual indigenous women

from one small rural community in Cochabamba, Bolivia, use the Spanish term *veces*, which means "sometimes." A case of language contact, a *veces* is used by these women to emphasize that they have not experienced an event, which marks evidentiality and has been brought into Andean Spanish from indigenous languages. More strikingly, some of the women also use a *veces* to express a negative valuation of and social distance from the topic of speech, in this case the state healthcare system, making a strong social statement. I argue that the negative and social distance that is expressed in these cases is precisely the result of an extended history of discrimination and exclusion. This history is fundamental to our understanding of how and why these women are using this particular linguistic resource to do social work.

Elliott, Leanne

Room 538, 12:15–1 p.m.

Understanding Sources of Individual Variability in Parents' Number Talk with Young Children

Several studies suggest that parents' use of number words with their young children (i.e., number talk) is positively related to children's understanding of mathematical concepts. However, parents vary widely in their number talk, and little is known about why some parents talk about numbers with their children more frequently than others do. In this study, we examine associations between number talk and children's math skills and assess several characteristics of parents that might be related to individual differences in their number talk. These characteristics include their subjective ratings of their math skills, preference for using math, beliefs about their children's math skills, and numerical approximation abilities. Forty-four 5- and 6-year-old children and their parents completed a variety of lab-based tasks, including a 10-minute free play session to assess parental number talk, a standardized math assessment for children, a non-symbolic numerical comparison task for parents (i.e., judging which of two sets of objects is larger), and several questionnaires for parents. Parents' overall number talk was not related to children's performance on the math assessment; however, parents' use of numbers larger than 10 was positively and significantly correlated with children's math abilities. These associations remained significant when controlling for parents' overall amount of talk as well. Parents' large number talk was also associated with their numerical approximation abilities and beliefs about their math abilities, suggesting that math-specific characteristics of parents themselves can explain some of the individual variability in parents' number talk.

Elliott, Rosalind

Room 538, 9:45–10:45 a.m.

Parental Coping Socialization and Anxious Early Adolescents' Neural and Real-World Responses to Threat

Parental coping socialization (PCS) practices are instrumental in the development of offspring emotion regulation (ER), including processing response to threat, yet little is known about how parenting influences the neural substrates of emotion processing and regulation. Additionally, neural processing of threat could play a role in avoidant coping behaviors used by clinically anxious youth during distressing events.

Methods: Healthy (n=33) and clinically anxious (n=87) adolescents, ages 9–14, and their mothers engaged in two laboratory interaction tasks designed to elicit individual differences in parents' response to children's anxiety. PCS was measured by coding frequency of mothers' statements that might help their child cope with anxiety elicited during these tasks. We assessed adolescent neural response to threat-related words during a valence identification task completed during neuroimaging. Adolescent avoidant coping strategy use was measured using ecological momentary assessment.

Results: Higher PCS was associated with lower activity in response to threat words in the bilateral insula and anterior cingulate (pgACC) in healthy adolescents, but higher bilateral insula response to threat words in anxious adolescents. Within anxious adolescents, greater neural activation to threat words within the insula and pgACC was related to less reliance on avoidant coping following negative, real-world events assessed via EMA.

Conclusions: Results demonstrate that parents' supportive socialization behaviors during interactions with their children are important to the function of neural substrates during emotion processing in early adolescence. Further, these associations differ between clinical and healthy adolescents and have implications for anxious adolescents' dependence on avoidant coping in their daily lives.

Emery, Rebecca

Room 539, 11 a.m.–noon

The Relationship Between Impulsivity and Body Mass Index Depends on How Impulsivity is Measured: Findings from a Comprehensive Meta-Analysis

Although impulsivity has been implicated in the development and maintenance of obesity, evidence linking impulsivity to obesity has been mixed. These mixed findings may be related to differences in the type of impulsivity measures used and the varied domains of impulsivity assessed by each measure. The present meta-analysis aimed to examine the impact of measurement selection on the relationship between impulsivity and body mass index (BMI). A total of 142 articles met inclusion criteria and were comprised of 315,818 participants. Effect sizes consisted of Fisher's z-transformed correlation coefficients, which were weighted by

the inverse variance to establish the grand mean estimate of the relationship between impulsivity and BMI. Overall weighted mean effect sizes also were computed for each type and domain of impulsivity measure. Moderator analyses were conducted using a mixed-effects approach to determine if the relationship between impulsivity and BMI varied between the types of impulsivity measures used. On average, participants were 32.25 (SD=12.41) years of age, with a BMI of 26.63 (SD=5.73) kg/m². The overall relationship between impulsivity and BMI was small but significant (r=0.07). Behavioral task measures of impulsivity produced significantly larger effect sizes (r=0.10) than did questionnaire measures of impulsivity (r=0.05). Domains of impulsivity that assessed disinhibited behaviors (r=0.10), attentional deficits (r=0.11), impulsive decision-making (r=0.10) and cognitive inflexibility (r=0.17) produced significantly large effect sizes. These meta-analytic findings demonstrate that impulsivity is positively associated with BMI and further document that this association varies by the type of impulsivity measure used and the domain of impulsivity assessed.

Fetters, Andrea

Room 540, 11 a.m.–noon

Exploring the Possible Link Between Urban Gardens and Wild Remnant Plant Populations

Humans strongly impact their surrounding environment through increased urbanization, which reduces plant and pollinator biodiversity, as well as the plant-pollinator interactions that provide necessary ecosystem services (i.e. pollination). To compensate for these losses, cities have implemented urban garden initiatives that aim to preserve plant and pollinator biodiversity. Although such practices have been successful, there are several effects of human-mediated plant introductions on the surrounding landscape that remain unstudied. Therefore, I hypothesized that a planted species (*Heliopsis helianthoides*) and wild remnant species (*Impatiens pallida*, *Impatiens capensis*) interact via shared pollinators, that the planted species either facilitates pollination to or competes with the wild remnant species for pollinators, and that the presence of a planted species changes the pollinator community composition of wild remnant populations. Pollinator observations in Schenley Park showed that the focal species share pollinators, that pollinators spend less time on either *Impatiens* when *H. helianthoides* is present, and that the composition of the pollinator community of either *Impatiens* is altered with the presence of *H. helianthoides*. In this system, the planted species competes with both *Impatiens* for pollinators. The presence of *H. helianthoides* also gave pollinators more foraging choices, suggesting a three-way interaction between each focal species, which places importance on species-specific evolution of floral characteristics to allow the coexistence of several co-flowering species. Similar, more broad studies along an urban gradient, along with experiments that explore the fitness impacts of planted

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species on wild remnant species, could inform management practices that protect all plant species in a community.

Forgrave, Rebecca

Room 540, 10–11 a.m.

Quantifying Urban Atmospheric Nitrogen Deposition with Ion Exchange Resins

Atmospheric deposition is a significant, yet poorly characterized, flux of reactive nitrogen to terrestrial and aquatic ecosystems. Fossil fuel combustion in power plants and vehicle engines releases NO_x to the atmosphere that is subsequently oxidized to nitric acid (HNO₃) and then deposited to the Earth's surface through precipitation or dry particulate deposition. Vehicle emissions in particular are concentrated in urban areas, however national monitoring networks (i.e., CASTNET for dry deposition, NTN for wet deposition) for reactive nitrogen deposition are generally located in rural areas far from urban sources. In this project, we aim to quantify the total atmospheric nitrogen fluxes deposited across the city of Pittsburgh using ion exchange resins and compare those fluxes to those collected at the nearest rural national monitoring sites. Ion exchange resins are small polyethylene polymer beads treated with counter ions to create charged exchange sites that selectively target anions or cations. These resins are packed into columns with funnels at the top to collect deposition. Dissolved nitrate or ammonium in the precipitation replaces the counter ions and remains bound to the resin until eluted. Preliminary results indicate higher deposition fluxes in Pittsburgh relative to rural locations, as well as considerable intercity variability in nitrogen fluxes. Ion exchange resins are a useful method for field collection of atmospheric deposition that is relatively inexpensive, can integrate over many weeks without requiring precipitation volume, and impart no isotope fractionation effects. This research fills in knowledge gaps regarding local nitrogen deposition fluxes and variability.

Forrester, Nicole

Room 540, 11 a.m.–noon

Plant Polyploidy Improves Host Benefit from the Legume-Rhizobia Mutualism

Polyploidy (the possession of more than two complete sets of chromosomes) is a major driver of evolutionary novelty and speciation in flowering plants. Although we have made significant advances in understanding how polyploidy affects plant genetics, phenotypes, and interactions with the abiotic environment, much less is known about how polyploidy influences plant-biotic interactions. One particularly important plant-biotic interaction is the legume-rhizobia mutualism, in which rhizobia bacteria fix atmospheric nitrogen (N) in exchange for carbon provided by legume hosts. This mutualism regulates global nutrient cycles, plays a prominent role in the evolutionary history of the

Fabaceae, and provides more than 100 million metric tons of fixed N to agricultural and natural environments annually. Despite the widespread importance of this mutualism, we do not fully understand whether plant polyploidy affects host benefit from the mutualism nor the underlying mechanisms. I evaluated the effect of plant polyploidy on mutualism traits and plant growth in 12 wild populations of alfalfa (*Medicago sativa*) singly inoculated with one of three rhizobia strains. I found that polyploid plants produced more nodules (modified root structures that house rhizobia) and had greater plant and nodule biomass relative to diploids. This suggests that polyploid plants benefit more from the mutualism, which could be partially attributed to improvements in nodule traits. Evaluating the role of plant polyploidy in enhancing the legume-rhizobia mutualism provides critical contributions to ecological and evolutionary theory as well as agricultural practices.

Fry, Josh

Room 539, 1–2 p.m.

Kant and Frege on Logical Generality

Gottlob Frege (1848–1925) is thought to be the father of modern logic. Immanuel Kant (1724–1804) is thought to be the last great champion of pre-modern logic. In this paper, I explore the differences between these two conceptions of logic. I think that a better understanding of this difference will enrich our modern view of logic's place in scientific inquiry.

Kant thinks logic is formal. Frege thinks logic is substantial. John MacFarlane, in his recent influential paper “Frege, Kant, and the Logic in Logicism,” thinks both Frege and Kant share a notion of logical generality from which their differing views of logic stem. This, he thinks, lets us see Kant and Frege as genuinely disagreeing. Otherwise, we might worry that Frege's logic—and hence our modern logic—is merely a change of subject. I question this worry. We don't need to (incorrectly) attribute shared notions to Kant and Frege in order to have something interesting to say about their disagreement. I want to read Kant as not so similar to Frege that he draws the wrong inferences from generality, but also not so different that there's no way to make sense of how they could be talking about the same thing—logic.

Gan, Xing Yee

Room 540, 11 a.m.–noon

Metallicity, Carrier Density, and Structural Evolution in Plasmonic Copper Selenide Nanoparticles

Degenerately doped copper chalcogenide nanoparticles exhibit localized surface plasmon resonances (LSPRs), making them cost effective alternatives to traditional Au and Ag plasmonic nanoparticles. Here, we describe the local structural transformations induced by air exposure for copper selenide nanoparticles and correlate those structural features with the

emergence of LSPRs in the resulting nanoparticles. Solid state NMR spectroscopy analysis of the colloids shows changes in short range crystallographic features as a function of air exposure in Cu₂-xSe which are not apparent from powder X-ray diffraction spectra from the same particles. Importantly, particle carrier densities can be directly derived from solid state NMR features simultaneously with the acquisition of particle structural information, and show that the experimentally determined carrier densities correlate well with these structural changes. Taken together, these experiments demonstrate how short range crystallographic changes control LSPRs in semiconductor nanoparticles. Moreover, they point toward new ways to make and control plasmonically active materials that enable their full suite of current and projected applications ranging from cancer therapy to photocatalysis.

George, Kelly

Room 540, 10–11 a.m.

A Systematic Approach Toward the Design of Structures that Mimic the Complex Folds and Functions of Natural Biomolecules

The crucial characteristic of proteins that allows these diverse and ubiquitous macromolecules to perform sophisticated biological roles is their propensity to fold into compact conformations. Unnatural designer polymers with defined sequence and folding propensity (termed “foldamers”) can mimic protein folds and functions, opening doors for diverse applications. Despite progress, the design of such molecules remains a significant challenge.

Our group previously reported an approach toward altering about 20% of the backbone of a small protein while retaining its tertiary fold. This approach utilizes several types of unnatural building blocks in concert to create heterogeneous foldamer backbones by substitution of natural amino acid residues in the starting sequence.

My project aims to advance this method to zinc finger domains, a target class in which tertiary fold formation requires binding to a metal ligand and gives rise to sequence-specific recognition of double stranded DNA. This poster describes the design, synthesis, and biophysical characterization of a series of backbone-modified variants of a natural Cys²His² zinc finger, Sp1-3 (the third finger of Specificity protein 1). Results obtained suggest that two variants successfully mimic the tertiary fold, ligand binding environment, and ligand binding propensity of the natural sequence.

Girard, Jeffrey

Room 538, 11 a.m.–noon

Large-Scale Observational Evidence of Cross-Cultural Differences in Smiling

Facial expression is a highly visible avenue of affective and interpersonal communication. The smile is a particularly important facial expression that can communicate positive affect, affiliation, and dominance. Individuals from cultures all over the world recognize smiles. However, some cultures tend to smile more than others. Previous research suggests that individuals may smile more if from a country that is more individualistic, wealthy, densely-populated, and culturally diverse. However, previous studies have been limited by either relying on self-reported smiling rates (which may not represent actual smiling behavior) or by observing a small number of participants from a small number of countries. In the current study, we leveraged recent advances in computer science to conduct the first large-scale observational study of cross-cultural differences in smiling. We used an internet-based framework to collect videos of participants as they watched local video advertisements in market research facilities. This approach allowed us to include 866,726 participants in 31 different countries. We then developed and used algorithms to automatically analyze participants' smiling behavior; these algorithms showed a high degree of agreement with expert human coding (ICC=.83). Finally, we used multiple regression to predict each country's average amount of smiling from its individualism, affluence, population density, urbanization, present-day ethnic fractionalization, and historical immigration heterogeneity. Smiling was significantly correlated with historical immigration heterogeneity ($r=.62$) and individualism ($r=.40$), but in the multiple regression model, the only significant predictor was historical immigration heterogeneity ($p=.025$). These results suggest that a long history of cultural diversity is associated with greater smiling.

Gremba, Allison

Room 540, 11 a.m.–noon

Measuring Digit Ratios from 2D Hand Scans Versus Negative Handprints: Implications for Archeology

The second to fourth digit ratio (2D:4D) is a sexually dimorphic trait. Digit ratios obtained from 2D hand scans of modern populations have been used to create discriminate functions to classify the sex of Paleolithic negative handprints found in caves. It is unclear, however, if 2D hand scans are a reliable proxy for negative handprints, potentially calling into question their usefulness in archeological applications. In this study, we tested the correspondence between digit measurements obtained from 2D hand scans and simulated negative handprintD hand scans (via flatbed scanner) and negative handprints (via sprayed body paint on a white background) were collected on 30 participants (21 females and 9 males). Digit lengths were collected and used to calculate 2D:4D for each method. For 2D hand scans, measurements were collected in tpsDig2. For negative handprints, measurements were collected with digital calipers. Paired t-tests were used to compare mean 2D:4D between the

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two methods.

Mean 2D:4D from the 2D scans was 0.97 (range: 0.91-1.09), while mean 2D:4D from the negative handprints was 0.99 (range: 0.90-1.20). This difference was significant ($p < 0.001$). Sex differences in 2D:4D tended to be greater with the negative handprints ($F = 1.00$, $M = 0.97$) than in 2D hand scans ($F = 0.97$, $M = 0.97$).

In conclusion, the negative handprints produced higher digit ratios with greater variability compared to 2D hand scans. Negative handprints may exaggerate sex differences in 2D:4D. These factors should be taken into account when attempting to interpret Paleolithic handprints.

Hadodo, Matthew

Room 539, 9:45–10:45 a.m.

Large Difference/Little Difference: Istanbul Greek [ʔ] and Language Ideologies

Approximately 2,000 native Istanbul Greek (IG) speakers remain in Turkey. IG contains dialectal features unexplored in any major study, yet brief mentions of IG in the literature often misrepresent it as identical to Standard Greek (SG). The historically multilingual community's status as an indigenous minority ethnic group presents an opportunity to understand how linguistic variation within an endangered dialect corresponds to the intersection of ethnic and national identity and linguistic ideologies.

One feature of IG is the velarization of /l/ before back vowels. This paper examines to what extent IG speakers with positive attitudes toward Istanbul and the dialect produce the allophone [ʔ], as opposed to those with more positive stances toward Greece and SG, which does not have the allophone.

An exploratory ethnography was conducted in Istanbul with 46 adults. Participants near unanimously considered [ʔ] to be a defining characteristic of IG and a major difference between IG and SG. Tokens of [l] and [ʔ] were recorded from word lists containing /l/ in different vocalic positions, as well as distractors. After acoustic phonetic analysis, rates of these variants' use were correlated to participants' attitudes towards IG and SG to determine if those with more favorable attitudes toward IG were more likely to produce [ʔ]. Initial analysis reveals that there is some correlation but important complications are also found. This study describes a community often overlooked across disciplines, particularly within linguistics. Furthermore, it explores phonetic variation within the nebulous interaction and subsequent expression of ethnicity and nationality within minority communities.

Hong, Charmgil

Room 539, 1–2 p.m.

Detecting Unusual Input-Output Associations in Multivariate Conditional Data

Despite tremendous progress in outlier detection research in recent years, most existing methods are designed only to detect unconditional outliers that correspond to unusual data patterns expressed in the joint space of all data attributes. Such methods are not applicable when we seek to detect conditional outliers that reflect unusual responses associated with a given context or condition. This work focuses on multivariate conditional outlier detection, a special type of the conditional outlier detection problem, where data instances consist of multi-dimensional input (context) and output (responses) pairs. We present a novel outlier detection framework that identifies abnormal input-output associations in data with the help of a decomposable conditional probabilistic model that is learned from all data instances. Since components of this model can vary in their quality, we combine them with the help of weights reflecting their reliability in assessment of outliers. We study two ways of calculating the component weights: global that relies on all data, and local that relies only on instances similar to the target instance. Experimental results on data from various domains demonstrate the ability of our framework to successfully identify multivariate conditional outliers.

Jakubowski, Karen

Room 540, 10–11 a.m.

Technology-Assisted Cognitive-Behavioral Therapy Intervention for End-Stage Kidney Disease: A Pilot Study

Background: Technology-assisted cognitive-behavioral therapy (CBT) interventions are efficacious for treating depression and pain disorders, and there is interest in extending such interventions to other medical populations and settings. Thus, we aimed: (1) to assess feasibility of a technology-assisted CBT intervention in patients with end-stage kidney disease who were being treated at a hemodialysis (HD) facility; (2) to test the efficacy of the intervention to reduce symptoms of depression, pain, and fatigue; and (3) to assess patient satisfaction.

Methods: Participants included 8 adults (mean age=58.7; 50% male) who screened for clinically-elevated depressive symptoms, pain and/or fatigue. For 8-10 weeks, patients met with a therapist for one hour during regularly scheduled HD sessions via a HIPAA-compliant video-conferencing platform. Patients used a study tablet equipped with headphones and microphone. The intervention included CBT modules that have been tested to treat depression, fatigue, and pain. Patients completed health questionnaires at baseline and at a three-month follow-up.

Results: At baseline, frequency of symptoms was as follows: (1) 25% had elevated depressive symptoms; (2) 75% had elevated pain; (3) 75% had elevated fatigue; and (4) 10% had elevations in all three symptoms. Patient satisfaction with the intervention was high and more than 95% completed all eight prescribed sessions. No significant changes in depression, fatigue, or pain were observed at three months, although there was small improvement in self-rated health.

Conclusion: Although our study was not powered to examine effectiveness of the intervention, we observed improvements in some patient-reported outcomes, which warrants further evaluation in larger clinical trials.

Jakubowski, Karen

Room 538, 11 a.m.–noon

Associations Between Cumulative Childhood Adversity and Cardiometabolic Disease and Mortality: A Meta-Analysis

Background: Evidence suggests that adverse childhood experiences may negatively influence cardiovascular (CV)-related disease and mortality. Because many studies are post-hoc analyses of large data sets, there is heterogeneity in terms of the type of items in cumulative adversity indices, sample sizes and demographics, and covariates. The present review used quantitative meta-analysis to examine the association and potential moderators.

Methods: Included studies had a measure of cumulative adversity (an index of at least 2 adverse childhood experiences from age 0 to 18) and at least one CV-related outcome (CV clinical events: hypertension, stroke, CHD; Framingham risk; and metabolic outcomes: diabetes, metabolic syndrome) or mortality measured at age 19 or older. Given different interpretations of odds ratios (OR) versus hazard ratios (HR), effects had to be pooled separately. Overall, 11 HR studies (19 effects) based on 212,246 participants and 23 OR studies (45 effects) based on 160,650 participants were included. Most studies used retrospective assessment of childhood adversity.

Results: There is a small but significant estimated effect of cumulative childhood adversity on adult cardiometabolic disease and mortality (HR=1.39, 95%CI [1.21,1.60]; OR=1.30 [1.22, 1.38]). Results varied somewhat by analytic strategy, number of covariates, and whether childhood SES was included in the cumulative adversity index.

Conclusion: Overall, the literature lacks a consistent operational and conceptual definition of adversity, particularly with regard to whether or how to include childhood SES. Thus, it is time for a conceptual perspective on the types and timing of events

that have maximal impact on adult cardiometabolic disease and mortality.

Johnston, Kathryn

Room 540, 10–11 a.m.

The Effect of Chemical Environment on Silver Ion Release from Silver Nanoparticles

The surface chemistry of nanoparticles strongly influences their resulting chemical and physical properties, and therefore also significantly influences the utility of these materials in a wide range of applications. A first step in both understanding and using nanoparticle surface chemistry is developing and implementing analytical methods to describe the chemical architectures present at the nanoparticle surface. Here, we compare the ligand exchange behaviors of silver nanoparticles synthesized in the presence of two different surface capping agents: poly(vinylpyrrolidone) (MW = 10 kDa or 40 kDa) or trisodium citrate, and under either ambient or low-oxygen conditions. In all cases, we find that the polymer capping agent exhibits features of a weakly bound ligand, producing better ligand exchange efficiencies with an incoming thiolated ligand compared to citrate and generating nanoparticles that are more susceptible to reactions with oxygen both during synthesis and ligand exchange. The influence of the original ligand on the outcome of ligand exchange reactions with an incoming thiolated ligand highlight important aspects of silver nanoparticle surface chemistry, crucial for applications ranging from photocatalysis to antimicrobials.

Kennedy, John

Room 539, 2:15–3 p.m.

Confronting History and Genocide: The Guatemalan Archive and Central American Postmodernity

In two Central American novels, Horacio Castellanos Moya's *El material humano* and Rodrigo Rey Rosa's *Insensatez*, archival and ethnographic documentation delimits a rupture with the aesthetic tendencies of modernism and testimonio, codifying the arrival of a postmodern literature to the literary cultures of the Northern Triangle region of Guatemala, El Salvador, and Honduras. The refraction of statist policies in these novels, whether the disappearing of tens of thousands during the civil war or the relevant paper trail of Guatemalan dictatorships prior to it, complicates spatial and temporal elements in each work's narrative mode. These complications serve an aesthetic point in that these novels recapitulate the past while subverting literary traditions present in the historical novel and in works of testimonio, illustrating that the aesthetic development of postmodernism in Central America must necessarily qualify its relationship not only to the archive but to the way any digression through its materiality must be restated in narrative. This study will illustrate how each novel encodes authorial presence, the

ABSTRACTS *(In alphabetical order)*

“yo,” with the experiences of the disappeared throughout each author’s process of reading archival material, a process that necessarily refracts the experience of kidnapping and exile into the author’s psyche, and complicates the temporality not only of the historical past, but of the authors’ searches for a form of repose from the saturating weight of the archive.

Kowallis, Kimberly

Room 540, 10–11 a.m.

The Role of a Cell-Fate Determining Protein in Bacterial Decision-Making

Though seemingly simple organisms, bacteria must make complex decisions which are critical for survival in a changing environment, inducing virulence, or symbiotic association with other organisms. One way bacteria determine cell fate is to divide asymmetrically, producing two cell types with different morphologies and functions. In order to achieve this, cells must partition cell-fate determining proteins into distinct complexes at opposite ends of the cell, so that upon division, the daughter cells undergo different developmental plans. A model organism for studying asymmetric division, *Caulobacter crescentus*, divides into an immobile stalked cell and a motile swarmer cell in order to survive in an aquatic environment. We have unraveled the mechanism of how a cell-fate determining protein DivL localizes to one cell pole and responds to signals in order to trigger changes in cell shape and function. Understanding the mechanisms of asymmetric cell division and cell-type changes can lead to the development of antibiotics to prevent bacteria from becoming virulent as well as the development of tools for engineering microbes for useful functions to benefit our society.

Lee, Dong Ju

Room 539, 11 a.m.–noon

Refugees vs. Immigrants vs. Net Migration: Which Inflicts Economic Costs?

Diffusion of individuals transcending borders has accelerated globalization; increasing trade, spreading norms, etc. However, the image of foreign newcomers has been worsening in many parts of the world recently. Although the international conventions encourage the protection of refugees, states hesitate to welcome the vulnerable population into their territory fearing the potential negative impacts refugees may have on their economy. Also, in developed countries migrant population has been accused of taking away jobs from natives. In some cases, opposition to immigration has even raised the popularity of right-wing parties. Does foreign population inflict economic costs on states hosting them? The goal of my research is to uncover whether the alleged economic burden of hosting refugees and immigrants is supported by empirical evidence. Also, I will examine whether the negative consequences are caused solely by foreigners newly entering

into a state or by people entering and exiting a state (i.e., net migration). Since states are rarely net importers of migrants, net migration, rather than an influx of refugees and immigrants, may be responsible for the economic consequences. I plan to examine how trans-border relocations of persons affect the economy of a state.

Li, Sijie

Room 538, 2:15–3 p.m.

Immigration and Economic Well-Being: Evidence from the Great Migration

Among the most enduring questions in labor economics is how newly arrived immigrants to a particular community affects the economic well-being of long-term residents of that community. This question has taken heightened significance in light of recent events in Western Europe and the United States, where increased immigrant flows have generated a large political backlash among long-term residents. This paper reconsiders the effects of immigration on long-term residents by studying the effects of the Great Migration, which brought millions of blacks from mostly rural southern areas to northern industrial cities between 1910 and 1970. Constructing a new intergenerationally-linked dataset, preliminary results show the arrival of predominantly low-skilled blacks from the South yielded a negative impact on the upward mobility of blacks born and living in the North.

Lowry, Cass

Room 540, 11a.m.–noon

The Morphosyntax of Georgian Heritage Language Speakers: A Developmental Analysis of Narratives

Heritage language (HL) competence features strong crosslinguistic trends, including a simplification of morphosyntactic features—such as verbal agreement, case-marking, and aspectual morphology—and a more monolingual-like competence of HL child speakers compared to adults (Benmamoun, Montrul, & Polinsky, 2013). However, the field currently lacks a full developmental description of HL morphosyntactic competence.

This study uses a cross-sectional, quantitative narrative analysis to determine whether the morphosyntactic features of an HL differ between child and adult speakers. Forty heritage speakers (HSs) of Georgian, born and raised in New York, ages ranging from 3 to 25, completed a language background survey, a Georgian lexical proficiency test, and told a narrative based on the Frog Story design (Berman & Slobin, 1994).

The analysis is guided by the following questions: Compared to monolingual Georgian speakers, do the Georgian HSs show: 1) agreement errors between verb class and subject/object agreement affixes?

- 2) agreement errors between verb tense and nominal case inflection?
- 3) a decreased use of pro-drop to clarify agreement errors in verbal morphology?
- 4) preferences for, or errors in, usage of specific TAM verbal series?

Georgian as an HL is of interest due to its complex morphosyntax; namely, a complex TAM system which selects variant nominal case-marking and subject/object verbal agreement inflections. Additionally, this is the first study to document Georgian as an HL. For these reasons, this study adds much needed data to the crosslinguistic portrait of HL morphosyntax.

McCabe, Steph

Room 540, 11 a.m.–noon

Eight-Step Enantioselective Total Synthesis of (–)-Cycloclavine

Cycloclavine is an indole-containing clavine alkaloid isolated from the seeds of the African morning glory shrub *Ipomoea hildebrandtii*. While cycloclavine has demonstrated promising insecticidal and antiparasitic activity its therapeutic potential remains underexplored. From a synthetic viewpoint, the highly complex rearranged ergoline core featuring an unprecedented pyrrolidine-fused cyclopropane poses a significant challenge. Herein, we describe the first enantioselective synthesis of the unnatural enantiomer (–)-cycloclavine. Key features of our approach include an enantioselective cyclopropanation of allene to form a chiral methylenecyclopropane. A diastereoselective strain-promoted intramolecular methylenecyclopropane Diels-Alder (IMDAMC) reaction and catalytic aerobic dehydrogenation reaction to establish the cyclopropane-fused hydroindolone core in >99% ee after recrystallization. Finally, an intramolecular Diels-Alder furan (IMDAF) reaction/aromatization sequence forges the indole motif. Our concise asymmetric synthesis represents a significant improvement in overall efficiency and should provide ample quantities of the natural and unnatural enantiomers for comprehensive biological evaluation.

Miramontes, Adriana

Room 539, 9:45–10:45 a.m.

The University Art Gallery as Art History Classroom

The Museum Studies Exhibition Seminar organized the exhibition *Paradoxes of Play: Concrete & Conceptual Proposals from Brazil and Beyond* at the University Art Gallery. Inspired by the Carnegie Museum of Art's exhibition *Hélio Oiticica: To Organize Delirium* we focused on 1950s-1970s Latin American art and politics in order to present a complementary exhibition. The resulting exhibition was a collaborative effort between undergraduate and graduate students, undergraduate teaching assistants, the gallery

assistant, the gallery curator, and the course professor. This unusually large curatorial team—comprised of 24 individuals—researched, designed, and installed the exhibition in a period of only three months, embracing the challenges and camaraderie of collaborative curatorial work on an expedited schedule. Throughout the semester, the curatorial team participated in the intellectual endeavor of visually communicating a research narrative across a three-dimensional space, arguing our case through juxtapositions of text and image rather than on the written page. Reflecting on our curatorial process, we aim to re-contextualize in our presentation the facets of this project that made materializing *Paradoxes* a unique endeavor. During this process, power relations that often form in cross-listed courses turned into collaborative efforts, and traditional class roles were altered as each participant actively took part in the decision-making process of organizing and presenting artworks and information. This agency allowed students to present art history research in innovative ways and provided with the opportunity of acquiring art history training in alternative contexts such as the gallery space.

Moon, Steven

Room 538, 1:15–2 p.m.

On the Ethics of Gender-Based Fieldwork

Ethnographic fieldwork since the 1980s in both anthropology and ethnomusicology has increasingly focused on gender as both subject and method of inquiry. The turn toward self-reflexivity encourages the ethnographer to write of not only their interlocutors but also of themselves, of the gendered power that exists between researcher and subject. A necessarily intersectional approach to gender and power makes the topic complex and requires intricate analysis. But what can be said of the ethical implications of conducting such work? When our ethnography is written and published, what happens to our interlocutors whose stories we tell? Reflecting upon fieldwork conducted in Baku, Azerbaijan, during the summer of 2016, this paper questions my responsibilities as an ethnographer as I write the lives of four young gay men. Living in a country where citizens fear government surveillance, and non-normative identities can result in severe physical harm and complete social ostracism, these gay men look to me, a white queer American, as a figure of a privilege. Is it possible for me to accurately represent their experience, sitting in the United States and reflecting from afar? What moral obligations does my privilege require I uphold as I attempt to retell their stories? Most importantly, is it safe for their stories to be told? As a reflection upon the process of conducting research and writing a humanist thesis, I must ask: is this worth writing?

ABSTRACTS *(In alphabetical order)*

Mullins, Angela

Room 540, 10–11 a.m.

Geochemical Response of Roadside Infiltration Trenches to Seasonal Changes in Pittsburgh, Pa., and Implications for Chemical Flux

By 2030, urban land cover is projected to increase by 180% globally and the UN predicts that about 60% of the world's population will live in urban areas. Urbanization dramatically alters local hydrology, generating hazards such as flooding and landslides and increases metal contamination from traffic and industrial emissions. Infiltration-based green infrastructure is designed to capture storm water runoff and reroute it into surrounding soils and groundwater thus reducing surface runoff. While some research has studied the impacts of road salt pollution, little is known about the patterns of dissolved metal concentrations that occur within these structures and resultant impacts to roadside environments. This work uses changes in dissolved metal concentrations within the infiltration trenches and local groundwater to evaluate trench function and measure dissolved metal transport from the trench systems. Several interesting patterns emerged: 1) The relatively slow infiltration rates increase with the onset of the growing season and decrease again during the winter on an annual basis. 2) The Ca/Sr ratio measured in the trenches changes seasonally, suggesting a transition in water dominant sources from road runoff in the summer to groundwater in the winter. These results are previously undocumented in roadside infiltration trenches, and will clarify the geochemical and hydrological impacts of infiltration based systems.

Neal, Jacob P.

Room 539, 11 a.m.–noon

How to Stop Worrying about Model Microfoundationality: Lessons from Multiscale Cancer Modeling

Microfoundational or bottom-up models aim to reproduce high-scale behavior of a system by modeling interactions between lower-scale entities. In a recent discussion of computational model improvement, Epstein and Forber (2013) posit five virtues of microfoundational models, claiming they have advantages over other model types. I argue that bottom-up modeling is not so special. The virtues Epstein and Forber associate with microfoundational models are not exclusive to bottom-up models. Analysis of cancer modeling shows that middle-out modeling that spans multiple spatial and temporal scales also embodies these virtues. These virtues cannot differentiate between bottom-up and middle-out modeling, thereby suggesting we ought to be pluralists with respect to biological modeling.

Neumann, Farrah

Room 538, 12:15–1 p.m.

Vowel Harmony in Peninsular Varieties of Spanish: The Morphology-Phonology Interface

This study investigated vowel harmony (VH) in two varieties of Peninsular Spanish—Eastern Andalusian and Montañés. Although both varieties undoubtedly exhibit VH, the triggers and targets for each variety result in metaphonic alternations that are quite distinct. Although previous research has extensively documented the VH of Andalusia and Montañés, no study has yet systematically compared Eastern Andalusian and Montañés VH using a singular measure for determining automatic and morphophonological alternations. In order to gain to a greater understanding of the Spanish morphology-phonology interface, the following research questions were posited:

- 1) What similarities and differences in the systems of VH can be noted for Eastern Andalusia and Northern Spain?
- 2) Is VH in Eastern Andalusian and Montañés more characteristic of an automatic or morphophonological alternation?

To address these questions, VH in each variety was described in detail and then classified as either an automatic or morphophonological alternation according to the following eight criteria indicated in Haspelmath and Sims (2010): phonological versus morphological or lexical conditioning, phonetic coherency, phonetic distance, restriction to derived environments, extension to loanwords, sensitivity to speech-style, creation of new segments, and restriction to the word level.

An in-depth analysis of the VH of each variety revealed that a binary classification as automatic or morphophonological was less appropriate than viewing these alternations on a continuum. This nuanced representation of these alternations as a continuum is a unique contribution to the literature on Spanish VH and provides a fresh perspective on the nature of VH alternations in Peninsular Spanish.

Neumann, Farrah

Room 539, 2:15–3 p.m.

Acquisition of Variable Commands in L1 and L2 Spanish: Examining Imperatives and Optatives

Two Spanish command forms are the imperative (*ven*) and the optative (*que vengas*), though both are roughly semantically equivalent to the English 'come.' Although Spanish native speakers (NSs) may judge the two forms to be semantically equal, existing studies on these variable forms are not empirically substantiated, leading to questions regarding their validity. The acquisition of variable structures more generally has shown that language learners can approximate local linguistic norms.

Preliminary corpus work has examined the factors that condition the use of either command form. However, it is not yet known how learners make use of these variables in their own variable forms, nor how NSs will respond to a controlled task eliciting the imperative, optative, or both.

Fifteen learners of Spanish completed a Written Contextualized Task before and after four-weeks abroad in Spain. Their overall rates of selection and predictive factors were compared to 50 NSs from Spain. In addition to examining social variables, direct object (none, clitic, noun phrase), formality (tú, usted), and previous command type (none, imperative same verb, imperative different verb, optative same verb, optative different verb) were manipulated. Learners' development by Time 2 was evidenced by their approach of the NS target in overall rates of selection and their movement away from predictors that misled them at Time 1. In addition to being the first empirical examinations of the selection of the imperative and optative by NSs, this is the first study of variation of this linguistic structure by learners, especially in an immersion context.

Pakzad, Ali

Room 539, 12:15–1 p.m.

Turbulence

This paper studies the time-averaged energy dissipation rate ϵ for the combination of the Smagorinsky model and damping function. The Smagorinsky model is well known to over-damp. One common correction is to include damping functions that reduce the effects of model viscosity near walls. Mathematical analysis is given here that allows evaluation of ϵ for any damping function. Moreover, the analysis motivates a modified van Driest damping. It is proven that the combination of the Smagorinsky with this modified damping function does not over dissipate and is also consistent with Kolmogorov phenomenology.

Redman, Shane

Room 538, 1:15–2 p.m.

Effects of Same-Sex Legislation on Attitudes toward Homosexuals

Despite the long historical battle of members of the LGBT community to gain equal rights as their heterosexual counterparts, the adoption of public policies at the national level that recognize same-sex partnerships and marriages is a relatively recent political development across the globe. Consequently, we know little about if, and how, this type of legislation affects public attitudes towards homosexuality. This study examines the relationship between same-sex couple legislation and public opinion using data from the World Values Survey from the years 1989 to 2014. While previous studies examining this relationship in the European context have found a positive relationship, the results presented in this paper

paint a less optimistic picture of the impacts that same-sex couple legislation has on attitudes towards homosexuality. Specifically, I find that instead of LGBT legislation increasing favorable attitudes, it has a polarizing effect, strengthening pre-existing attitudes in both positive and negative directions. Implications for LGBT rights are discussed.

Rerick, Michael

Room 540, 11 a.m.–noon

Improvements to In Vivo Monitoring of Neurotransmitters Using Online Capillary High Performance Liquid Chromatography with Electrochemical Detection

Neurotransmitters play a critical role in a variety of biological functions within the brain. Dopamine (DA) and serotonin (5-HT) specifically are thought to modulate neurological functions controlling addiction and depression while also contributing to disorders such as Parkinson's disease and schizophrenia. The ability to efficiently study these analytes and their pathways within the functioning brain is important for discovering the underlying causes of these disorders and opening up new avenues for treatment. One method for studying these analytes is using in vivo animal models and online sampling via microdialysis coupled to capillary scale high performance liquid chromatography (HPLC) with electrochemical detection (EC) for solute separation and quantification.

The challenge when performing this technique is maintaining the balance between separation speed and performance. Sampling times must be fast enough to detect short time scale changes in extracellular concentrations, yet still maintain the required performance to keep detection limits low enough to quantify these changes. Our lab works to monitor these basal concentrations of neurotransmitters while optimizing the temporal resolution and sensitivity of our separations.

Our current work strives to expand upon our previous studies by enhancing the measured signal for a given quantity of each neurotransmitter using our developed temperature-assisted solute focusing (TASF) device. We are also working to move toward multiple solute analysis by studying more than one neurotransmitter at a time. Currently, we are optimizing these methods in vitro with plans to soon implement these advancements using the animal model.

ABSTRACTS *(In alphabetical order)*

Roemer, Emily

Room 540, 10–11 a.m.

Examining the Relationship Between Gesture and Language Development in Infant Siblings of Children with Autism Spectrum Disorder

Gesture and language are closely related in early communicative development. Caselli et al. (2012) propose that the transition from early gestures to word production is mediated by word comprehension; however, this has not been directly tested. The present study seeks to examine this proposed relationship in a population with considerable variability in early communicative abilities—the younger siblings of children with ASD (High Risk infants; HR)—and to examine whether this pathway is moderated by diagnostic outcome.

Participants included 92 HR infants and 28 infants at low risk (LR) for ASD. A primary caregiver completed the MacArthur-Bates Communicative Development Inventory (CDI; Fenson et al., 1993) at 12, 14, and 18 months, and HR infants received a diagnostic evaluation for ASD at 36 months.

Word comprehension at 14 months mediated the relationship between 12-month gesture production and 18-month word production in a diverse sample of LR and HR infants ($ab = .263$; $p < .01$). For LR infants and HR infants with no diagnosis or language delay, 12-month gesture had a significant influence on word comprehension ($as = .666$; $.646$; $.561$; $ps < .01$). However, this association was not significant for infants later diagnosed with ASD ($a = .073$; $p = .840$).

Consistent with proposed pathways of language development, our findings suggest that word comprehension mediates the transition from early gestures to word production. Additionally, we find that this pathway (specifically gesture to word comprehension) may be disrupted in infants later diagnosed with ASD.

Schwartz, Laura

Room 538, 12:15–1 p.m.

A Demanding Power of Interiority: Performers as Justifications of Music's Value in Verbally Notated Compositions of the Early 1990s to the Mid-2000s

From the 1990s to mid-2000s something happened within power dynamics of interiority, the idea that music, as art, can transcend, transport, and transform experience. During this time, verbal notation, a score construction relying on prose notation, was a tool used by composers for shifting the litmus test of interiority away from themselves and onto performers. As performers became the main generators of music's interiority, fractured legacies of interiority from the 18th and 19th century developed as compositional devices within the scores. With this shift,

performers produced the composition's interiority and in turn its justification as art.

Similarly, in the 1990s, the field of musicology experienced a paradigm shift from composer-centric (mind) discourse to performer-centric (body) discourse with works such as *Feminine Endings* (1991) and *Queering the Pitch* (1996). As a signifier of transcendent practice, interiority was studied as coming from bodies. In verbally notated scores, however, interiority is generated simultaneously by the performer's body and intellect. By focusing on three verbally notated scores, I assert verbally notated scores, as a subset of American Experimentalism, perpetuated a fragmented legacy of interiority within its performers. In this presentation, I examine Pauline Oliveros' *Breaking Boundaries* (1991); Stephen Montague's *Kristallnacht* (1998); and Jennifer Walshe's *This is Why People O.D. On Pills/and Jump From the Golden Gate Bridge* (2004). Drawing from John Lely's *Word Events* (2012), I use the grammatical tools of context, processes, and voice to question how and what kind of interiority these three scores demand from their performers.

Sherman, Ashley

Room 538, 9:45–10:45 a.m.

Depictions of Race and Gender in the Film Chicago (2002)

Jazz has held connotations of gender and race since its widespread dissemination into the mainstream music culture in the 20th century. Though these connotations have changed significantly throughout the history of jazz and its many styles, they are still visible in modern day perceptions and performances of jazz music in media advertised to the general public. The movie *Chicago* (2002) and its soundtrack illustrate this point. The movie itself is based upon the Broadway show and the play, both with the same name. The story is set in the 1920s and serves as social commentary on the corruption of the justice system during the Jazz Age, as well as allowing the audience to draw parallels to the modern justice system. For sake of consistent experience and overall distribution, the modern movie is the focus of this paper. Through examination of the solo performances of each of the main characters (Roxie Hart, Velma Kelly, Billy Flynn, Matron "Mama" Morton, and Amos Hart) and the use or absence of jazz idioms, a pattern of ideas about race, gender, and sexuality appears, which is further reinforced through the dialogue and treatment of these characters by each other as well as those in power. Coupled with the commercial success of the movie and its soundtrack, as opposed to the smaller audiences that the musical and play attracted in their live productions, we can begin to understand how the mainstream general audiences of the public choose to perceive jazz music and those who perform it.

Smith, Sarah

Room 540, 10–11 a.m.

From Signal to Shape: Investigating How Alterations to Signaling Pathway Activity Generates Newly Evolved Morphology

The development of anatomical structures is multifaceted, involving both patterning of gene expression and its resulting influences on cellular processes. Early stages in most developmental processes involve patterning events that determine where transcription factors and signaling pathways are expressed. These decisions ultimately determine which cellular effectors are activated in a tissue, controlling the unique morphology for each cell. While much is understood regarding how patterning and cell morphogenesis are achieved individually, how these two processes are integrated remains unclear. Evolutionary studies provide a unique perspective for this problem, as they can reveal genetic changes that naturally altered cellular architecture. Thus, to address this question I examined a recently evolved morphological structure, the posterior lobe. Dissecting how an important signaling pathway for posterior lobe development is transcriptionally regulated, I discovered a pair of redundant transcriptional regulatory sequences that drive its expression, and traced unique evolutionary histories for these elements. The coincident origination of one of these enhancers with the posterior lobe raises the possibility that this enhancer played an important role during its initial evolution. In parallel, my work on the cellular basis of the posterior lobe's development has found that it forms through elongation of cells along their apico-basal axis. We have identified a promising process of microtubule elongation that may contribute to this cellular phenotype, including genes that are highly patterned during posterior lobe development.

Spinner, Codee

Room 527, 2:15–3:15 p.m.

Music, Suffrage, and Domesticity: Music's Role in the Lives of Progressive Era Women in the United States, 1900–20

Women living in the United States during the early decades of the 20th century were faced with an ideological dilemma surrounding the issue of woman suffrage. How could women reconcile the seemingly unbridgeable divide between what it meant to be a full-fledged, voting citizen while simultaneously upholding the feminine ideals rooted in the “Cult of True Womanhood?” Answering this question is a complex task because, depending on a wide variety of factors, women often had disparate experiences navigating issues of femininity and women's rights. Some women chose to reconcile traditional ideals of womanhood and domesticity with their quest for suffrage. Other factions instead distanced themselves from and challenged these standards. The varying degrees of friction created by these two forces-femininity

and feminism-were not strictly reserved for women active in political resistance, but were represented in contemporary musical performance. While suffrage tactics reflected different ideologies and strategies for creating and shaping identity, female performers made similar decisions pertaining to self-presentation as musicians. These decisions took a multitude of forms, from the spaces in which the musicians chose (or lacked the choice) to perform to the extent in which femininity was inherent within organizational structure of the ensembles. Decisions of this nature were not limited to the concert hall, but materialized within suffragist music. By approaching suffrage music from the perspective of female music-making and the practice of femininity and feminism, a rich, complex picture emerges of this seemingly simple genre, demonstrating the extent to which women took action in diverse situations.

Steinken, Woodrow

Room 538, 11 a.m.–noon

Reconsidering Alban Berg's Intellectual History: The Invented Interiority of the Lyric Suite

When George Perle discovered the autograph-annotated score of Alban Berg's *Lyric Suite* in 1977, he revealed the music's “secret program” to the world. That program was the story of Berg's extramarital love for Hanna Fuchs-Robettin, the wife of a Prague industrialist and friend of Berg's. Berg created this secret program by inserting many hidden elements within the music, such as tonal cyphers, numerological references, and a secret, unsung vocal part in the sixth movement. The discovery of the secret program, I contend, was part of a larger physical trace of invented interiority that the composer left behind for scholars to uncover in the hopes that a specific intellectual history would develop. The interiority of the *Lyric Suite* is but one example of Berg attempting to relay an esoteric autobiography that future scholars would include in their analyses of the composer and his music.

The piece's interiority was revealed through Berg's letters to Hanna, his annotations in the score, and the scholarly discourse concerning the piece before Perle's discovery. Berg was successful in using the secret program, i.e., inventing interiority to mystify his compositional process and determine the way musicologists wrote about his personality and compositional output after his death. My paper attempts to demystify Berg and his personality, and to an extent, rewrite the intellectual history surrounding the composer. By exposing the interiority of the piece as invented, much of Berg's musical, literary, and oratory output consequently is also subject to great re-examination.

ABSTRACTS *(In alphabetical order)*

Tembo, Mathew

Room 539, 9:45–10:45 a.m.

After the Show, Both the Performer and the Listener Need Dialogue

Recently, it has become common to see musicians or performers dialogue with their audience after a performance. In these performance spaces the performer and the listener actively participate in a performance as they both attempt to reconstruct the sonic presentation at hand. The dialogue between the performer and the listener at the end of a performance is an opportunity for both parties to find a resolution to any outstanding issues regarding the performance. The two parties further have an opportunity to ask questions and provide answers. Then, closure, is attained. The *New Oxford American Dictionary* defines performer as a person who entertains an audience. In this paper, I use performer to mean an initiator of action, and listener to mean the person responding to the action initiated by the performer. A musician is a performer, so is a soldier engaging in a violent act—and the listener in this case—is the person who listens to the sounds initiated by the soldier—the sounds of war. Whereas the experience of the performer and listener at a music event is pleasurable, that of the performer and listener in a war situation is traumatic. The fact that traumatic injuries are not visible on the victims' bodies have not made it easier to understand trauma. This paper focuses on “after war trauma.” It further explores dialogue, including music dialogue as an avenue of relieving war trauma.

Tisherman, Rebecca

Room 540, 11 a.m.–noon

The Rate of Urbanization and Variation in Impacts to Sediment in Fluvial Systems

The rapidly expanding cities of the 21st century cause a more intense urbanization and are therefore likely to alter urban stream geomorphology distinctly from historical urbanization.

Due to more intense development practice, sediment inputs to the stream should be greater and widening and incision more extreme than the majority of urban streams studied to date. Comparisons among sets of urbanized streams in the U.S have emerged, but these sets are generally limited to 20th century urbanization, following a relatively homogeneous history of human activity. This presentation documents the broad spectrum of potential scenarios shaping global urban streams through meta-analysis of the literature. The data synthesis reveals important gaps in our comparative set of urban streams and therefore identifies additional combinations of land use history and urbanization rates necessary to clarify processes that drive changes in urban streams. The clarification of variability in stream responses to contrasting land use change regimes is fundamental to our ability to predict geomorphological change and thus our ability to mitigate

this change in urban systems.

Toth, Sharon

Room 540, 10–11 a.m.

Discerning the “At-Risk” Factors of Cruciate Cranial Ligament Rupture in Dogs

The cranial cruciate ligament (CCL) in dogs is homologous to the human anterior cruciate ligament (ACL). Similar to humans, dogs are at a potential risk for rupturing this ligament. It is debated whether at-risk rupture in humans and dogs is due to altered forces or genetics. Several factors have been isolated that may contribute to a dog potentially rupturing their CCL, which may serve as a model in the future for humans. Early spaying/neutering has been one that has been highly controversial in the literature. Recent data are starting to show that it may be a larger factor than previously believed, especially in large breed dogs. This study used clinical data compiled from Oklahoma State University Veterinary Hospital to test for significant differences in variables associated with rupture, including breed, size, tibial plateau angle, luxating patella and spay/neuter/intact status. A surgical group for repair of the CCL was compared to a non-surgical control group to discern the higher risk variables associated with rupture. Among the surgical cases only 4 of 29 were intact while for the non-surgical group 21 of 28 were intact (ChiSq = 21.7, $p < 0.01$). In the surgical group, there were 16 females and 13 males and in the nonsurgical group there were 19 females and 9 males. This difference by sex was not statistically significant ChiSq = 0.97 ($p > 0.01$). These results support previous research. These preliminary findings will be used in defining further research that will test hypotheses about altered force and genetic models of CCL rupture.

Vamosy, Domonkos

Room 539, 1–2 p.m.

An Event Study of Investor Sentiment

I explore whether the anticipation and uncertainty caused by the upcoming release of an earnings report causes investors to excessively rely on pricing information, as a way to compensate for the inevitable information gap between their current knowledge about the company, and the new knowledge that will be disclosed in the report. The results in this paper indicate a predictable variation in the reliance of such information.

Villada, Diego

WPU Room 538, 2:15–3pm

Swimming in Quindío, Colombia's RECUCA

The tourist destination RECUCA, or Recorrido de la Cultura Cafetera, in Quindío, Colombia, includes various opportunities to be immersed in the culture of a working coffee farm. Patrons are

asked to pick coffee beans, “just as the collectors do,” to more fully appreciate the product of coffee, one of Colombia’s main exports.

In *Simming: Participatory Performance and the Making of Meaning*, Scott Magelssen adapts the “simming” from online gaming to analyze simulated, immersive, performative environments, from libraries to living history museums. Magelssen uses simming to evaluate the attempt and efficacy of such scenarios to disseminate information and even promote social change. I propose to apply Magelssen’s simming methodology to the experience of RECUCA, a hybrid scenario of entertainment, education, and consumerism that might be characterized as a spectacle of both the quotidian and the global. I propose that simming offers provocative complications to established narratives of tourism and exploitation in the region. I argue that the simming of coffee picking provides an opportunity (currently underutilized) for the advocacy of betterment in working conditions of coffee pickers in Colombia.

Walsh, Rebecca

Room 540, 11 a.m.–noon

Cold or Caring? How Do People Respond to the Threat of a Romantic Rival?

According to risk regulation theory, when faced with threat, people can either connect with their partners or self-protect. People with high self-esteem (HSEs) tend to connect, whereas people with low self-esteem (LSEs) tend to self-protect. We were interested in how HSEs and LSEs respond to a particularly potent type of relationship threat: the threat posed by a romantic rival. We measured 165 romantically-involved participants’ self-esteem and randomly assigned participants to imagine an audio-guided scenario in which their partners either reciprocated a rival’s flirtation (high threat condition) or politely rejected the rival (low threat condition). Connection versus self-protection was operationalized through coder-rated responsiveness of participants’ written reply to their partners’ hypothetical disclosure. Participants under high threat were less responsive (more self-protective) than participants under low threat. State jealousy mediated this effect. Self-esteem did not qualify this effect. Thus, rival threat may be a rare context in which even HSEs self-protect.

Weeks, Jillian

Room 540, 10–11 a.m.

Modeling Behavioral Mechanisms Underlying Increased Smoking in Schizophrenia

Roughly 80% of U.S. individuals with schizophrenia (SCZ) are smokers, in comparison to 18-20% of the general population, and smoking-related illnesses account for over half of deaths among people with SCZ. The mechanism behind this significant difference in smoking behavior remains unknown. Though animal

models allow a valuable degree of control in studying factors that modulate nicotine (NIC) reinforcement, which drives smoking behavior, limited work exists studying NIC reinforcement in rodent models of SCZ. Our lab utilized the methylazoxymethanol acetate (MAM) model of SCZ, which is regarded for its reliability and high face validity in modeling behavioral and pathophysiological symptoms of SCZ, to study behavioral mechanisms of NIC reinforcement. A group of MAM and control rats was tested for locomotor sensitization to NIC across five daily sessions. Another group of MAM and control animals was allowed to self-administer nicotine across a range of doses, paired with a neutral cue light (CL) or mildly reinforcing visual stimulus (VS). There were no significant differences between MAM and control animals in development of locomotor sensitization to NIC across a five-day period, and no significant differences in acquisition or rate of NIC self-administration paired with neutral CL across a range of doses. However, MAM animals earned more NIC infusions than controls when paired with VS. These findings suggest that increased smoking among patients with SCZ may not be due to enhanced locomotor sensitivity or increased primary reinforcing effects of NIC itself, but rather to an increase in the reinforcement enhancing effects of NIC.

Wu, Zhaohong

Room 538, 9:45–10:45 a.m.

Second Language Processing of English Derived Words: Effects of Differences in L1 Typology, Morphological Awareness, Orthographic Awareness, and L2 Proficiency

There has been a growing interest in whether native (L1) speakers and second/foreign language (L2) learners process morphologically complex words in real-time in the same way when they silently read and whether the underlying linguistic systems constitute the same type of knowledge systems. The current study is the first to systematically examine (1) whether and how L2 English learners of typologically (morphology, orthography, and writing systems) different L1s differ in their morphological awareness, and (2) effects of L1 typology, morphological awareness, orthographic awareness, and L2 proficiency on on-line L2 morphological processing of English derived words.

Study 1 examined participants’ on-line morphological processing patterns as revealed by the differential priming effects among conditions using a visual masked priming lexical decision task implemented on E-Prime 2.0. Three L2 groups of typologically different L1s were recruited, including Turkish, Chinese, and Vietnamese. An L1 English group was included for comparison and to validate materials. The same participants from Study 1 took part in Study 2 after their completion of Study 1. Study 2 examined L2 morphological awareness in a series of computerized on-line tasks with no time constraint, and also

ABSTRACTS *(In alphabetical order)*

collected measures of orthographic awareness and L2 proficiency.

This proposed research has implications for theories on the representation and processing of the bilingual lexicon, by demonstrating clear L1 typological influence on the representation and processing of morphology. The L1 influences found in this study have educational implications on how we could incorporate the findings of the current study into L2 instruction.

Yang, Melissa

Room 540, 11 a.m.–noon

Project Pigeon[hole] – Marginal Animal I Craft Material

Debra Hawhee recalls that when George Kennedy analyzed the rhetorical energy of animals in “A Hoot in the Dark,” his “fleeting dalliance with animality” caused “shockwaves”—but his risky assertions offered the discipline “tantalizing suggestions of what animality can do to—and for—rhetorical theory.” Stemming from such theories, I offer a case study of pigeons and pigeonholes as connected to historical and material cultures of reading, writing, and rhetoric.

Pigeons have long been domesticated in dovecotes for meat, dung (fertilizer and leather softener), homing instincts, science, and show. The term “pigeonholes” has been transferred to objects material to academia—from filing compartments in Victorian writing desks to interoffice cubbyhole mailboxes. Within academia, “pigeonholing” becomes figurative: “to assign a particular category or class in an excessively rigid or presumptive manner; to label or categorize mentally” (OED). This associative exploration aims to usher forth appreciation of the common pigeon’s place and potential in rhetoric and composition studies.

Zalewski, Jenna

Room 540, 10–11 a.m.

Structural Insights into the Shroom-Rock Interaction

During development, dramatic changes in shape occur as functional tissues and organs form. These changes in tissue morphology are driven at the cellular level by the coordinated movement, division, and shape change of constituent cells; processes that are regulated by dynamic subcellular networks of actin and myosin. Rho Kinase (Rock) is a major regulator of the cytoskeleton that phosphorylates non-muscle myosin II to drive rearrangements in the cytoskeleton. Rock is localized to distinct subcellular locales via interaction with the actin-binding Shroom (Shrm) family of proteins. The binding domains for Shrm and Rock have been mapped to ~200 amino acid regions on each protein, however the molecular mechanism of their interaction was not well understood. I have crystallized and determined the structure

of the complex between Shrm and Rock to 3.3Å resolution. This structure revealed striking differences between *Drosophila* and Human versions of the Shrm SD2 domain, and provided detailed insight into the interface between the two domains. Biochemical and in-vivo probing of the interface and has led to the identification of critical residues contributing to Shrm-Rock recognition. In addition, kinase activity assays indicate that Shrm proteins can stimulate Rock catalytic activity, directly showing for the first time that Shrm proteins function as Rock activators. These data have enhanced our understanding of the role the Shrm protein family plays during development.

Zhang, Ning

Room 527, 2:15–3:15 p.m.

Does Sophie’s Choice Weaken Reverse Altruism?

In this paper, we use Chinese Twins Data to investigate parental Sophie’s choice on send-down movement and the effect of parental choice on adult children’s reverse altruism. We find that parents tend to send the child with weaker endowment to the rural areas. However, send-down has a positive effect on the treated adult children’s current earnings though they are inferior in endowment. Based on these results, we further find that parental choice on send-down weakens adult children’s reverse altruism: the send-down (treatment) group has a lower transfer to their parents both in probability and amount. Moreover, they are less likely to co-reside with their parents.