

16TH ANNUAL

Graduate Multidisciplinary Conference

*An annual conference to showcase the research and projects of the
Clark University graduate student community.*

WEDNESDAY, APRIL 18, 2018, 12-8 P.M.
HIGGINS UNIVERSITY CENTER



Program Schedule

The graduate Multidisciplinary Conference is a place to learn about the ideas and methods unique to each of the many fields encompassed by Clark University graduate research. The mission of the MDC is to give Clark Students a broad perspective on academic research, as well as to offer the graduate community the experience of communicating their findings to a diverse academic audience.

- 12-1 p.m.** **Welcome Luncheon**
Higgins University Center, Tilton Hall
- 12:45 p.m.** **Opening Remarks:**
Yuko Aoyama, Dean of Research
- 1-3 p.m.** **Oral Session A**
*Higgins University Center,
Grace and Lurie conference rooms*
- 3-4 p.m.** **Poster Session**
Higgins University Center, Tilton Hall
- 4-6 p.m.** **Oral Session B**
*Higgins University Center,
Grace conference room*
- 6-8 p.m.** **Evening Reception**
Higgins University Center, Tilton Hall

Oral Presentations

Session A

Grace Conference Room, Higgins University Center

1 p.m.

Scanning Tunneling Microscopy Studies of CeTe₂

Presenters: Bishnu Sharma, Manoj Singh, Philip Walmsley, Ian R. Fisher, Michael Boyer

Department: Physics

Adviser: Michael Boyer

The RTe₂ (where R = rare-earth ion) compounds are the less-well-studied relatives of the RTe₃ compounds. Whereas the RTe₃ compounds are composed of alternating layers of conducting double Te-planes and insulating R-Te block layers, the RTe₂ compounds are composed of alternating single conducting Te-planes and insulating R-Te block layers. Similar to the RTe₃ compounds, the RTe₂ compounds are quasi 2-dimensional and host charge density wave (CDW) states. A number of techniques, including ARPES and TEM, have been employed to gain insight into the Fermi surface and CDW states in RTe₂ compounds. Whereas STM has been successful in imaging and characterizing CDW states in RTe₃ compounds, including CeTe₃ and TbTe₃, similar comprehensive STM studies have not yet been conducted on the RTe₂ compounds. Here we present our room-temperature scanning tunneling microscopy measurements of CDW states in CeTe₂.

1:15 p.m.

Non-trivial interaction of drag in sedimented granular beds

Presenter: Benjamin Allen

Department: Physics

Adviser: Arshad Kudrolli

Dragging a single rod in a fluid can be characterized with a field flow around the rod causing a force that depends on the speed that it is dragged. If the same thing is done with a bed of small particles this force dependency changes, now there is a yield stress necessary to create motion. Now, with a sedimented material heavier grains in a fluid, we can show a cross over from yield stress behavior to a sharp rise as the system crosses over to fluid. Additionally there is a non trivial increase in the force as more intruders are spaced at different distances. Instead of two intruders contributing to twice the force, we measure depending on the phase, granular or fluid, that it can be more or less with a crossover at the point where the forces are equal.

1:30 p.m.

An Examination of Monopoly Pricing Through Market Concentration: Evidence from Airline Mergers

Presenter: Elizabeth Hanke

Department: Economics

Adviser: Sanghoo Bae

Pricing schemes are a common practice in the airline industry, in which airline firms group consumers and essentially charge different prices for the same ticket. This paper looks specifically at the Delta-Northwest and American-US Airways mergers to determine whether price discrimination exists through a merger treatment effect. The subsidiary airline carriers for Delta and American Airlines are also examined, which are Endeavor and Envoy Air. In addition, the airline firms' market concentration is used to determine how price reacts to increased market share from the acquisitions.

This paper uses panel data from the Bureau of Transportation Statistics ranging from 1993 to 2016, along with a difference-in-difference and fixed effect model. The results indicate that the merger treatment effect is positive and significant for Delta Airlines and Endeavor Air, while it is negative and significant for American Airlines. An instrumental variable approach is used to solve for the endogeneity issue between concentration and price, which is positive and significant at the 1% level.

1:45 p.m.

Estimating New Orleans's Income Response to Hurricane Katrina with Synthetic Control

Presenter: Joshua Bernard

Department: Economics

Adviser: Marc Rockmore

The main goal of this research is to measure the short- and long-run effects of Hurricane Katrina (and the almost immediate response by FEMA and other emergency responders) on the income of New Orleans, treating the aftermath of the hurricane as an exogenous reduced-form treatment effect. While the negative sign of such an impact might seem intuitive, some literature provides contrary evidence; thus finding the direction, magnitude, and duration of the impact becomes a nontrivial exercise. This is accomplished using the synthetic control estimation method,

developed by Abadie and Gardeazabal (2003) and Abadie, Diamond, and Hainmueller (2010). Applying this approach to the Katrina shock entails taking a panel of U.S. counties within the contiguous 48 states on the mainland, focusing specifically on a county directly subjected to Hurricane Katrina, and then taking a subsample of remaining counties unaffected by the hurricane to construct a synthetic counterfactual which should resemble a version of the treated county in which the hurricane treatment never happened. This counterfactual is designed to be virtually identical to the treated county before the hurricane in 2005 with respect to income per capita and other key factors, and the time paths of these factors are extrapolated for subsequent years for easy comparison to the real treatment county. Preliminary results suggest that, in the case of New Orleans, exposure to Katrina actually temporarily increases income per capita relative to the counterfactual scenario. This counterintuitive result may be explained by population attrition by evacuation and emigration, and by the stimulus effect generated by aid from governments and charitable organizations. 81,901 copy number variable regions (CNVRs) ranging from 100 basepairs to >3.65 kilobase (Kb) across all samples were identified and quantified. Gene ontology enrichment analysis of duplicated genes present in all VGII subgroups revealed concerted duplication of genes with functions related to metabolism, biosynthetic pathways, membrane and transport. Assessment of divergent CNV loci in subgroups belonging to the VGII lineage revealed 67 highly divergent CNVRs harboring 58 unique genes. Enrichment analysis of Pfam domains located within divergent CNVRs showed lineage-specific stratification in proteins associated with catabolism, metabolism, transport and both cell wall composition, organization, cellular amino acid metabolism and external encapsulating structure, the latter two being well-characterized contributors of virulence in *C. gattii* and other pathogens. CNVRs identified in this study may contribute to virulence, gene expression, fungicide resistance, host specificity and a recent niche habitat expansion of *C. gattii*.

2 p.m.

Mindful marriages: The effects of meditation on romantic relationships

Presenter: Justin Laplante

Department: Psychology

Adviser: James Cordova

Meditation and mindfulness are associated with many positive outcomes, including reductions in stress, anxiety, and depression, increased well-being, and increases in self-regulated behavior and positive emotional states. Most relevant to the current paper, a small but growing literature has begun to investigate the effects of mindfulness on intimate relationships, over and above the beneficial outcomes associated with intimate relationships in general. However, to date most research focuses on self-reported overall mindfulness levels within the general population; there is relatively little investigation of the effects of a dedicated meditation practice on long term relationships. No research as of yet focuses on how the influence of a meditative practice on romantic relationships might change over time, both as the relationship and the meditation practice grow and develop. In order to best understand this process, interviews were conducted with long-term meditators who are in romantic relationships. Utilizing a thematic analysis, common themes and patterns were identified. Analysis is still ongoing, but preliminary results indicate that meditation benefits relationships primarily through acceptance and emotional non-reactivity. Detailed results will be presented, as well as discussion as to how these findings relate more broadly to all couples. A special focus will be on how these findings can be used to strengthen all relationships.

2:15 p.m.

Acknowledgment of collective victimization: A fundamental step towards peace

Presenter: Michelle Sinayobye Twali

Department: Psychology

Adviser: Johanna Ray Vollhardt

Researchers and practitioners alike generally argue that acknowledgment of collective victimization is a fundamental step in the aftermath of conflict (e.g., Hamber, 2007; Staub, 2008). Indeed, recent empirical studies have provided evidence for its' significant role on victim groups' well-being (Vollhardt, et al., 2014), reconciliation with other conflict parties (Hameiri & Nadler, 2017), and attitudes toward third-party victim groups (de Guismé & Licata, 2017). However, there is no consensus on what exactly constitutes acknowledgment of collective victimhood, who should engage in the acknowledgment,

and why acknowledgment is important. Victim, perpetrator, and third party groups likely have different perspectives on these questions, yet acknowledgment is provided and therefore usually determined by the latter two groups. In this talk, we focus on the victim group's perspective and present findings from a qualitative study conducted among members of communities that have experienced collective victimization—African-Americans (N=73), Armenian-Americans (N=72), Jewish-Americans (N=70), and Palestinians in the diaspora (N=58). Content analysis of the responses revealed notable similarities and differences between the groups on what proper acknowledgment entails (e.g., transitional justice mechanism, symbolic measures etc.), who should engage in the acknowledgment (e.g., members of the perpetrator, ingroup, other victim groups, etc.), and why acknowledgment is important (e.g., identity, individual and collective well-being). These responses are interpreted in light of differences in the sociopolitical contexts of the victim groups in the aftermath of the collective victimization that need to be considered when designing interventions aimed at providing adequate forms of acknowledgment for victim groups in the aftermath of violence.

2:30 p.m.

Negative Influences of Parents During Transition into Adulthood of Indian American Emerging Adults

Presenter: Achu Johnson Alexander

Department: Psychology

Adviser: Jeffrey Arnett

Previous research has examined the benefits of continued parental involvement among mainstream Americans along with exploring the aversive ways in which parents are involved in the lives of their emerging adult children (e.g. helicopter parenting — Padilla-Walker & Nelson, 2012). Yet negative parenting influences have not been examined among ethnic minorities, for whom family is a central influence. The present study adopts a qualitative design to explore Indian American emerging adults' perceptions of how their parents have negatively impacted their progress towards achieving adulthood. From a larger quantitative study with Indian Americans, seventeen individuals were identified and recruited for participating in a semi-structured, individual interview. The overarching finding on negative parental influence emphasized how parents socialized their emerging adult children towards doing one's dharma (i.e. one's duty) in terms of fulfilling expectations and achieving the ethnic ideal self. The findings and implications of the study will be discussed.

2:45 p.m.

Are preferences stated in web vs. personal interviews different? Willingness-to-pay results for a multi-country study of the Baltic Sea eutrophication reduction

Presenter: Ewa Zawojaska

Department: Economics (visiting student)

Adviser: Mikołaj Czajkowski

Stated preference surveys are administered by various modes: mail, phone, web and personal interviews. The prevailing view is that controlling for samples' relevant characteristics, the choice of a data collection mode does not significantly affect the survey results. However, a close look into the existing research reveals that findings on the mode effect are not that univocal. Given the recently increasing use of web surveys, the investigation of the effect of this mode on respondent's behaviour appears particularly important. Our study tests differences in value estimates of a public good derived from Computer-Assisted Web Interviews (CAWI) and Computer-Assisted Personal Interviews (CAPI). We compare web surveys with personal interviews, as the latter have been long acknowledged as a best practice in stated preference research.

We use data from a large multi-country study that inquired the social value of the Baltic Sea eutrophication reduction and involved all Baltic Sea countries. In Poland, the survey was administered through two modes: CAWI and CAPI. Based on this data, we verify whether the value estimates differ between these survey modes. We find that CAWI respondents are willing to pay on average significantly more for the improvement than CAPI respondents.

Based on the significant difference between CAWI and CAPI, we use the relative difference between them as a correction factor for calculating the social value of marine eutrophication reduction for every Baltic Sea country. The survey was administered through different modes (web and personal) in different countries. We compare our results with the values reported by Ahtainen et al. (2014), who evaluated this improvement for each Baltic Sea country without controlling for the mode effect.

Session A

Lurie Conference Room, Higgins University Center

1 p.m.

Waste as Biopower Reclaimed in Margaret Atwood's *The Year of the Flood*

Presenter: Emma Berman

Department: English

Advisers: Betsy Huang

In Margaret Atwood's *The Year of the Flood*, the God's Gardeners religious eco-cult embrace waste in order to navigate their lack of biopower. As doomsday preppers, the gardeners marginalize themselves and refuse to participate in the formal economy and society. They live beyond the economic ghettos termed the "pleebands"; their spatial position outside of society reflects their intellectual distance from the corporations. Because they abstain from the market, the gardeners must turn to other means in order to meet their needs. They are (self) denied access from the food, healthcare, and military resources their mainstream peers use in order to survive. They produce their own foods and clothing, and they repurpose all of the wasted materials produced by the formal economy. This repurposing is only exacerbated after the "waterless flood", an apocalyptic event that eradicates almost all human life on earth.

In the transition from corporate waste to gardener supplies, waste materials take on a second life. Waste is transformed into gardener social capital; wearing, eating and otherwise using wasted materials allows the gardeners to materially confirm their religious and political views. In this paper, I will analyze this transformation of wasted material. I suggest that embracing waste allows God's Gardeners to look like an eco-cult, thus materially reinforcing their internal position. Through their unique survival strategies, the Gardeners develop biopower that is ultimately more effective than the biopower of the Corporations.

1:15 p.m.

Contesting the Normalization of Violence through Counter-storytelling: How a grassroots youth organization subverts the perpetuation of interpersonal and structural violence in Cape Town, South Africa

Presenter: Nicole le Roux

Department: IDCE

Adviser: Nigel Brissett

The purpose of this study is to describe the knowledge shared by youth development staff in an NGO in Cape Town about the impact of violence on youth development work. Through five open ended interviews and review of organizational materials, the study uses a narrative and feminist intersectionality analytic to ask how Educo has and could use the critical race theory method of counter-storytelling to subvert the normalization and perpetuation of interpersonal and structural violence. The paper demonstrates how the knowledge and expertise of the people in the organization, as they respond to violence youth face, is not valued by funders and the South African government in defining and responding to violence. It also shows how Educo staff can and are working with counter-storytelling as a means of subverting development and strengthening their ability to serve youth.

1:30 p.m.

Conceptual Vulnerability Meta-analysis

Presenter: Guy Hydrick

Department: Geography

Adviser: Rinku Roy Chowdhury

We examine urban vulnerability to climate extremes, with an approach integrating Vulnerability Science and Socio-Ecological-Technological systems (SETs) frameworks. The rich history of vulnerability research and assessments derives from diverse disciplinary perspectives and concerns through time. These perspectives, while invaluable in highlighting key dimensions of societal vulnerability to various stressors, are frequently partial; focus on configurations or outcomes rather than processes; are often static rather than dynamic, or lack an explicit focus on power relations. Here, we undertake an integrated approach to vulnerability analysis that conceptualizes vulnerability for urban systems in particular, examines SETs dimensions, and highlights the need to pay attention to processes of marginalization in the production of vulnerability. We review empirical case studies of urban vulnerability

to climate threats such as sea level rise, flood events, heat and drought, while building on the seminal framework for “vulnerability analysis in sustainability science” (Turner et al. 2003) and the three main dimensions of vulnerability (Polsky et al. 2007): exposure, sensitivity and coping capacity. Our aims are twofold: to advance the vulnerability framework for the particular complexities of urban systems as coupled socio-ecological-technological systems, and highlight the trends, synergies and gaps in the empirical literature vis-à-vis attention to particular SETs domains, and with respect to the three dimensions of vulnerability.

References:

Turner et al. 2003. A framework for vulnerability analysis in sustainability science. *Proceedings of the National Academy of Sciences* 100(14): 8074-8079.

Polsky et al. 2007. Building comparable global change vulnerability assessments: The vulnerability scoping diagram. *Global Environmental Change* 17(3-4): 472-485.

1:45 p.m.

Dónde esta ‘Mi Gente?’ An analysis of Spanish-language music awareness using Tweets in the United States

Presenter: Will Heikes

Department: Geography

Adviser: John Rogan

In 2017, two Spanish language songs ranked in the top ten of the Billboard Hot 100 for the first time. Luis Fonsi and Daddy Yankee’s ‘Despacito’ and J Balvin and Willy William’s ‘Mi Gente’ both reached the top ten with the help of English language remixes featuring Justin Bieber and Beyoncé respectively. This study examines the impact of these remixes using the case study of ‘Mi Gente’ using tweets. The aim of this study is to examine the change in the demographics of the awareness of Spanish Language music within New York City, Los Angeles, Miami, and San Francisco, before and after the release of the English language remix featuring singer Beyoncé. Using regression and sentiment analysis, this study explores the demographics of and reception to Spanish Language music across a 40 day study period in regards to the English remix. The study is the first of its kind to use tweets to analyze musical awareness geographically. The results presented in this study serve to influence the promotion and marketing targeted toward a Spanish language song among an English audience, and may have a broad effect upon the popular music scene.

2 p.m.

Introducing the YIMBYs: renters, housing, and supply-side politics in LA

Presenter: Renee Tapp

Department: Geography

Adviser: Mark Davidson

This paper examines the growth of the yes-in-my-back-yard (YIMBY) movement in Los Angeles. It argues that YIMBYs derive many of their policies from the work of Harvard urban-economist, Edward Glaeser who mixes neoclassical economic theory with state intervention to increase competition and choice in cities. YIMBYism is the latest iteration of pro-development politics used to bolster the intensification of land use in Los Angeles, particularly around housing and represents a distinct evolution in urban politics by shifting urban governance away from homeowners and urban elites to renters. To understand how YIMBYs have gained traction and political influence in Los Angeles, this paper identifies the core economic issues, structures, and policies of this movement. Using recent city and state ballot initiatives to illustrate the competing demands on land use in LA, I demonstrate how YIMBYs have politicized structural conditions shaping housing shortages to 1) advocate for the deregulation of zoning, 2) increase the housing supply, and 3) enable urban development through the political claims of renters.

Session B

Grace Conference Room, Higgins University Center

4 p.m.

Becoming Fundable? Converting Climate Justice Claims into Climate Finance in Mesoamerica's Forests

Presenter: Laura Aileen Sauls

Department: Geography

Adviser: Anthony J. Bebbington

Indigenous and traditional forest peoples in Mesoamerica maintain that they are the 'guardians of the forest' and have mobilized across scales to assert that forest climate policies should involve them directly – they are not mere 'beneficiaries'. According to the Mesoamerican Alliance of Peoples and Forests (AMPB), the idea of Reducing Emissions from Deforestation and Forest Degradation (REDD+) has opened a window for advancing member groups' claims, despite concerns that REDD+ could be development-as-usual in practice. These

groups hold legal rights to 60 percent of Mesoamerica's forests and through AMPB are proposing a Mesoamerican Territorial Fund (MTF) to directly capture climate finance, bypassing problematic relations with the national governments and environmental NGOs conventionally promoting REDD+. In its MTF proposal, AMPB draws on normative and instrumental conceptualizations of justice, arguing that addressing the legacies of historic marginalization will also lead to the best forest outcomes. To attract the attention of any entity that could capitalize the MTF, however, AMPB and its members must prove that they can conform to donor requirements and expectations, even though the mechanism is meant to be designed around them and for their territories. Given these tensions, this paper draws on eleven months of collaborative fieldwork with AMPB to ask: can the process of constructing the MTF provide a viable and just model of climate finance for forested lands under community control? What are the possibilities and limitations for these groups of engaging in REDD+, given concerns over historic injustices and current threats to their rights and lands?

4:15 p.m.

United in the Struggle: The Role of Land Ownership for Communities of Internally Displaced Persons in El Salvador

Presenter: Corie Welch

Department: CDP

Adviser: Denise Humphreys-Bebington

After facing displacement, the community of 30 de Abril, a semi-rural community in El Salvador, united to undergo a five-year struggle with the government to earn the titles to their land. Now, after winning the battle to legalize their community, the members continue to work together to develop their community, proving their resilience in the face of displacement. Using the example of 30 de Abril, this paper explores their story, seeking to understand the importance of the land title for the community. Guided through the ideas of social capital, asset based development and development as freedom this paper conveys the importance of land titles as a unifying force that represents both a means and an outcome of collective action.

4:30 p.m.

Understanding Growth Dynamics of Small Urban Places: The case of New England (1990 to 2015)

Presenter: Richard Ramsawak

Department: Economics

Adviser: David Cuberes

This paper utilizes recently published US Census data covering the pre-and post-Great Recession period (1990 to 2015) to identify key determinants of growth and resiliency among small, and mid-sized urban places in the New England Region. Growth rates in population and income levels are found to vary significantly relative to city/town size, which leads us to reject random growth theories. We find strong and robust evidence of beta-convergence in real income growth, indicating that smaller urban areas tend to experience faster rates of income growth than larger ones. Convergence is also found to occur in population growth but particularly over the long-term. Factors such as distance to large central city and amenities were found to be particularly relevant to population growth. For income growth, having a diverse industrial base, high levels of well qualified resident human capital, and proximity to large urban areas are positively related to income growth and recovery after the “Great Recession”. We also find evidence of positive and significant spatial effects in population growth. This indicates the presence of “spillover” effects in growth among neighboring urban regions. Finally, these results are found to be consistent and robust to alternative specifications and varied estimation techniques such as Instrumental Variables (IV), and Generalized Methods of Moments (GMM) estimation. These results highlight the importance of policy geared to increase industrial diversity, and also highlight the importance of building, retaining and attracting quality human capital to urban areas.

4:45 p.m.

The effect of exposure to violence on household savings: evidence from drug war on Mexico

Presenter: Zahra Albohmoed

Department: Economics

Adviser: Marc Rockmore

In this paper I study the sharp increase in violence experienced in Mexico after 2006, known as “The War on Drugs” and its effects on household savings. Using a standard difference-indifferences (DID) model and data from the 2005-06 and 2009-12 waves of the Mexican Family Life Survey, I find that the surge in violence in Mexico after 2006 significantly

increased household savings. This result is robust to different specifications and treatment assignments. Moreover, the analyses show that it is important to account for different region and head characteristics. Estimations from DID specifications reveal that the overall effect are driven by young men head of household with lower education. I furthermore show that effects are more pronounced for low-income household and those who live in urban area.

5 p.m.

Networks of Isolation: Trump, Facebook, and the Limits of Social Movement Theory

Presenter: Carol L. Stimmel

Department: IDCE/IDSC

Adviser: Nigel Brissett

The 2016 election that catapulted Donald J. Trump to the U.S. presidency has raised questions for how Facebook may have enabled the emergence and coalescence of a social movement among traditionally improbable voters. The research in this paper engages with contemporary social movement theory, assessing its adequacy for explaining the role of Facebook as a primary method for facilitating a social movement among the civically-alienated, who are the most unlikely of all Americans to join an organized collective for change. From a methodological perspective, the exploration takes up the case as a strategy of inquiry to explore social movement theory in the context of algorithmically-mediated social networking environments. It is concluded that the presence of a proprietary algorithmic mediator deployed by Facebook creates deliberate effects among its users which cannot be explained with social movement theory. These effects cannot be easily studied without unethical cognitive manipulations or information distortion.

5:15 p.m.

New York Unpainted: A Racial Reading of Fitzgerald’s The Great Gatsby

Presenter: Maral Askarisirchi

Department: English

Adviser: James Elliott

F. Scott Fitzgerald has always been praised for his scrupulous depiction of the social and cultural details of the settings in his works. The reader can easily follow a social history in the novels, and catch the feeling of the times. The Great Gatsby as one of Fitzgerald’s most prominent works has always been associated with the American decade in which it is set: The

Roaring Twenties. His depiction of the era, or the Jazz age (a term he coined to describe the period) in the Manhattan borough of New York City, is so rich in detail that the readers cannot help but imagine themselves as part of the momentous spirit of the time. But what might come to the attention and somewhat surprise of any reader with cultural and historical sensitivity, is the author's complete exclusion of the "roaring" of the African American culture that was taking place at the same time in the Harlem neighborhood of Manhattan. This raises some questions about the author and his work's general attitude towards the African Americans. It is not reasonable to believe that such ignoring on his part has been unconscious or involuntarily because, as will later on be mentioned, Fitzgerald was himself particularly fond of Jazz music and frequented Jazz clubs, and yet one of the primarily pioneering places that gave birth to the Jazz music gets no mention in his otherwise detailed narrative. Why is then Harlem overlooked in the author's masterpiece?

5:30 p.m.

Challenges and Opportunities in Development and Evaluation in Conflict-Affected and Fragile Contexts: The Case of Afghanistan

Presenter: Qudratullah Jahid
Department: IDCE

Despite billions of dollars spent on development and reconstruction, Afghanistan remains a failed state marked by conflict, weak economy, displacement, ineffective institutions, and lack of public trust in government among many other problems. This state indicates lack of success of development efforts and institution building in Afghanistan. Robust and rigorous monitoring and evaluation systems with strong political ensures efficiency, effectiveness and long-term impacts. Valuing and more investment on comprehensive M&E systems by donor community and government of Afghanistan could result in increased return on development investment. Use of distinctive and efficient methods and information and communications technology enables establishing and maintain strong M&E systems in contexts such as Afghanistan.

This paper attempts to explore these issues by reviewing existing literature from Afghanistan and other similar contexts. It examines challenges, observes opportunities and provides recommendations for stronger M&E systems for improved development outcomes. Strong M&E systems play vital role in ensuring progress towards achieving Sustainable Development Goals.

5:45 p.m.

SWOT Analysis of Comprehensive Anti-Gang Strategies (CAGS)

Presenter: Jenelle Howard
Department: GSOM/IDCE
Adviser: Ramon Borges Mendez

Worcester has faced many challenges with violence among youth in underserved areas. Over the past couple of years there has been an increase of violent behaviors on the East-Side of Worcester. This paper focuses on evaluating a program that was developed to help with combating these troubles on the Eastside of Worcester. Comprehensive Anti-Gang Strategies or CAGS is funded by the Office of Juvenile Justice and Delinquency Prevention (OJJDP) in the amount of \$327,312. This evaluation of CAGS will include a breakdown of the program and the need for the program. It will also include an analysis using the SWOT framework to help analyze the strengths, weaknesses, opportunities and threats that CAGS may be facing. A review of literature focuses on similar programs and the implementation of the program. As well as interviews of the partners on the grant and a detailed observation of the program from the writer of this paper. The goal of this paper is to take an in-depth look into CAGS to see if it is a valuable program and if it can be sustained in the future. The paper will conclude with recommendations from this writer in hopes of preserving the program in the future.

Poster Presentations

Posters will be hung in Tilton Hall and will be available for the duration of the conference. A main session will be held 3-4 p.m.

1. Assessing spatiotemporal trends in nutrient runoffs from the Everglades Agricultural Area, Florida

Presenter: Carson Hauck
Department: IDCE GISDE
Adviser: Rinku Roy Chowdhury

In this study we evaluate the spatial and temporal trends in phosphate discharges from farms within the Everglades Agricultural Area in the period from 1994 - 2016. We also identify the most important factors behind the spatial and temporal trends we observe, ranging from land management practices to environmental factors such as rainfall and soil type/depth. This research is funded by NSF as part of the Florida Coastal Everglades (FCE) LTER Program.

2. Identifying Early Season Invasives for Monitoring and Management in the Colorado National Monument

Presenter: Zachary A. Peloquin

Department: IDCE

Adviser: Kenton Ross

Bromus tectorum, otherwise known as cheatgrass, is an invasive grass from Europe that has increased its presence all over the world by out-competing native grasses due to its adaptability and lifecycle. During the end of its life cycle, typically occurring in the summer, its flammable remains often create the conditions for forest fires to start early in the season. This possibility alters the native vegetation's and wildlife's response to wildfires. The presence of the senesced material can increase the overall frequency of fires. As a result, cheatgrass often disrupts the necessary recovery time for native wildlife after habitat destruction. This NASA DEVELOP project utilized Landsat 5 TM, Landsat 8 OLI and TIRS, Terra MODIS, and Sentinel-2 MSI to study the spread of cheatgrass throughout the Colorado National Monument and the surrounding area to determine locations at risk of being invaded by cheatgrass. The results of the study included historical and current cheatgrass population maps, multi-criteria evaluation (MCE), MCE analysis, and forecasted early season activity spread. The MCE analysis assessed the factors and constraints that contribute to the vulnerability to cheatgrass invasion. The results from this project will assist the National Park Service in improving their monitoring and management efforts and help contribute to the prevention of cheatgrass in Colorado National Monument.

3. The Rise, Fall, and Revival of the Moviegoing Experience: The Viability of Independent Theatres in a Multiplex World

Presenter: Isabel Cruz

Department: IDCE

Adviser: Ramon Borges-Mendez

Moviegoing has been a leisure activity since the 1890's. As multiplex theatres are shuttering their doors, independent cinemas are surviving and thriving. Independent cinemas serve as a community gathering space where people from different socioeconomic backgrounds can come together. This presentation includes results from interviews with independent cinema owners and managers. Findings are used to create a business proposal for an independent cinema to be located in Worcester, Massachusetts.

4. The effect of violent crime on female decision-making within the household: evidence from the Mexican war on drugs

Presenter: Zahra Albohmoed

Department: Economics

Adviser: Marc Rockmore

This paper uses the surge in drug-related violence in Mexico to study the effect of violent crime on married women's decision-making. Using a fixed-effects regression model, we find that increased violence is associated with a reduction in women's participation in household decision-making. Yet, the effect is small – at the average, it leads to women making 0.11 fewer decisions, a decrease of 1.2% relative to the baseline value. Further, the effect is short-lived – the effect of past homicides is not significant when controlling for current levels of violent crime. We find that violence is associated with higher probability of working and higher number of working hours for women, while men experience a reduction in their probability of working. This implies that our results are likely not due to changing norms or women losing economic power but rather women spending less time at home while men take on some of the household responsibilities.

5. What does it mean to consider yourself an "addict"?: The impact of identity on treatment-seeking behaviors among individuals with substance use problems

Presenter: Madeline Benz

Department: Psychology

Adviser: Kathleen Palm-Reed

Individuals who identify with marginalized groups experience unique stressors and stigma that shape how they are viewed and treated. Identifying as an "addict" carries a mainstream connotation that the individual is blameworthy, which is a stigmatizing perspective that may serve as a barrier to treatment-seeking for young adults. Other studies have found certain types of stigma may facilitate treatment. Given research suggesting fear of stigma may be more salient than the experience of stigma for some marginalized groups, we examined treatment-seeking behaviors in a national sample of 171 young adults with a history of problematic substance use.

6. "Why So Resentful?" A Theoretical Model of Perceived Victimization in Majority Groups

Presenter: Mukadder Okuyan

Department: Psychology

Adviser: Johanna Ray Vollhardt

Collective victimhood researchers have focused on low power groups or minorities with historical or present experiences of physical, structural, and/or symbolic violence. As the meaning of victimhood has changed and become more symbolically and morally powerful (Moscovici & Perez, 2009), majority groups have recently started to claim experiences of victimization despite the inherent implications about power loss (Shnabel & Nadler, 2015). While a growing number of empirical studies examine perceived victimization among majority groups, there is a need for theorizing that brings together these investigations from different contexts into a model integrating social psychological predictors of perceived victimhood among majority group members. This is the aim of this talk. We argue that there are three main pathways that drive a sense of victimization in majority groups. First, this occurs when there is a discrepancy between perceived collective entitlement, and present or future detracting from that status. In other words, for majority groups who feel entitled to material and symbolic resources (Blumer, 1968) for several reasons we discuss, societal changes that imply a present or future loss in this status may lead to perceived victimhood. A second pathway to claims of victimhood is morality threat posed against the majority group when accused of ingroup wrongdoing committed against other groups in society. Third, perceived legitimacy threats (e.g., questioning of privilege) may give rise to claims of victimhood. We will discuss these factors in context, comparing groups with historical grievances (majority group members in Turkey) and groups without such historical claims (U.S. Whites).

7. Experiential Avoidance and Post-Trauma Functioning among Survivors of Intimate Partner Violence

Presenter: Lia Bishop

Department: Kathy Palm Reed

Adviser: Psychology

Research has consistently identified a strong, positive relationship between experiential avoidance (EA) and posttraumatic distress. EA, or persistent efforts to avoid unwanted cognitive and affective events, is an important predictor of psychopathology and may reinforce rigid conceptions of self. Specifically, attempting to alter the

frequency or intensity of certain thoughts and experiences may encourage over-simplified interpretations of a trauma and its sequelae, leaving a survivor feeling "stuck" in a conception of self that is rooted in their trauma history. This mixed-methods study examined the impact of EA on posttraumatic stress, depression, and conceptions of self in a sample of 80 survivors of intimate partner violence (IPV).

Results suggest that less experientially avoidant participants exhibited both clinically and statistically significantly lower symptoms of posttraumatic stress ($F(2,77) = 20.917, p < .001$) and depression ($F(2,76) = 27.481, p < .001$) than their more avoidant counterparts. These findings held constant regardless of age and time since trauma. Grounded theory analyses were used to code qualitative, open-ended interview responses in which participants described how traumatic experience impacts "who [they] are today." Individuals who reported high levels of experiential avoidance were significantly more likely than their less avoidant counterparts to endorse a sense of being "stuck" and "broken", describe more pervasive negative affect as "core" to their identity, and perceive themselves as having less post-trauma agency.

These findings suggest that EA is an important predictor of psychopathology among trauma survivors, and manifests in the way that survivors of IPV conceptualize and describe their post-trauma identity.

8. Biophysical Analysis of Homeodomain Transcription Factor-DNA Binding Site Affinity

Presenter: Rachel Orlomoski

Department: Biology

Adviser: Robert Drewell and Donald Spratt

A topic of great interest in biology and many other fields is the ability of transcription factors (TFs) to recognize and bind to specific DNA target sequences in order to produce important changes in gene expression. TFs regulate expression for genes by binding at cis-regulatory modules (CRMs). Some TFs show great specificity in their binding, and research has shown that some TFs selectively bind to sites that show interdependency within their nucleotide sequences. The focus of this project is to physically determine binding affinity for transcription factors at their known DNA binding sites to determine how that binding strength will change based on the nucleotides in the given binding site. Homeodomain (HD) TFs belong to a large class of TFs in *Drosophila*, and several HD TFs were chosen for protein over expression in *E. coli*, protein purification, and use in binding assays to measure binding affinity. These

proteins all contain a highly conserved 60 amino acid region called the homeodomain. Full-length fushi tarazu (FTZ) was initially chosen as the protein of interest, but following many problems involving insolubility, cell toxicity, and degradation, the protein was cut down to only its HD. This approach allowed for purification of the protein. Several other HDs were also purified, and all will be used in gel shift mobility assays and ITC to determine binding affinity. Once the binding affinity data has been gathered, those values will be used to generate and further modify an algorithm to predict binding affinity for a TF at a specific binding site.

9. Uncovering the mechanism of the HERC2 C-Lobe Extension: An Ubiquitin Ligase Implicated in Breast Cancer Tumorigenesis

Presenter: Noah Schwaegerle

Department: Biochemistry and Molecular Biology

Adviser: Donald Spratt

The human genome contains an estimated 20,000 protein-encoding genes, with each gene having the capacity to transcribe one or more protein variant or isoform. Ubiquitylation is a post-translational modification (PTM) that attaches ubiquitin, a small signaling protein, to a variety of substrates involved in all facets of cellular physiology. This is among 200 other unique PTM's that contribute to diversifying protein function, mediating protein turnover, and determining the fate of proteins in the cell. In this research, we present novel structural and biochemical characterization of the conserved C-terminal lobe domain of the large HECT E3 ubiquitin ligase HERC2. This protein family and domain are known for facilitating the direct transfer of ubiquitin to substrate, making this study paramount towards expanding what we currently know about mutant HERC2 and disease state. Notably, HERC2 is involved with breast cancer through regulating two key DNA repair pathways associated with the tumor suppressor BRCA1, and excision repair factor XPA. To establish the framework for studying dysfunctional HERC2 in human disease, we completed preliminary studies of this catalytic domain through expression and purification, site-directed mutagenesis, In Vitro ubiquitin activity assays, and NMR spectroscopy. HERC2 also contains a unique 40 residue extension off the end of its C-lobe which we have experimentally shown to be essential for coordinating polyubiquitin chain building activity in this protein. These findings led us to hypothesize that the HERC2 C-lobe tail is dynamic and employs a unique mechanism of ubiquitylation that is critical for preserving the native function of this protein in the cell.

10. Biochemical studies of the HECT E3 Ubiquitin Ligase WWP1 and its involvement in Ebola, Breast, and Prostate Cancer

Presenter: Emilie Ogisu

Department: Biochemistry

Adviser: Donald E. Spratt

WWP1 (WW domain containing Protein 1) is a HECT E3 Ubiquitin ligase involved in the Ubiquitin signaling pathway which serves to attach ubiquitin to substrate proteins for degradation. Through this pathway, WWP1 can regulate the expression and activity levels of proteins involved in major intracellular signaling pathways (i.e. TGFB, EGF). As a result, WWP1 is involved in processes such as cell differentiation, apoptosis, proliferation, osteoblast differentiation, virus budding, transcription, and intracellular trafficking. Past studies have shown that WWP1 is overexpressed in 31-51% of breast and prostate cancers and recent studies have shown WWP1's involvement in the Ebola virus. In the Spratt lab, the objective is to purify WWP1 to further understand its structure and biochemical properties. Purification is carried out via immobilized metal affinity chromatography and size exclusion chromatography. After obtaining pure WWP1, a variety of tests such as circular dichroism, nuclear magnetic spectroscopy, and ubiquitin activity assays can be carried out to further understand secondary structure, stability, folding, and activity. With the structure, the mechanism in which the HECT E3 Ligase catalyzes the ubiquitin transfer step can be understood which can then lead to the development of drugs for targeting various human diseases (i.e. cancer, viruses, etc.).

11. Structural and Biochemical Studies of the HECT E3 Ligase Arel1

Presenter: Lara Prosterman

Department: Biochemistry and Molecular Biology

Adviser: Donald Spratt

Ubiquitination is a post transitional modification that regulates many diverse biological functions within a cell. Ubiquitination acts as a signal for many biological pathways such as protein degradation, protein activity, and preventing and/or promoting certain protein-protein interactions. Ubiquitin is transferred onto its target protein through a three-step process, which involves transferring ubiquitin between three enzymes, the E1 activating enzyme, E2 conjugating enzyme, and E3 before it can reach its final target. Apoptosis-resistant E3 Ubiquitin Ligase 1 (AREL1) is a HECT E3 ligase, which is involved in regulating the apoptosis pathway. It is the only HECT E3 ligase known to

form lys33 poly ubiquitin chains. In order to better understand how Are11 forms these unique chains, NMR spectroscopy and Biochemical assays have been utilized. After successfully purifying the C-lobe of Are11, fluorescent Ubiquitin assays were used to show that the C-terminal lobe of Are11 is still able to bind to fluorescently labeled Ubiquitin when in the presence of E1's and E2's. Isotopically labeled Are11 was then purified and used for NMR spectroscopy. NMR spectroscopy was then used to assign the backbone residues of the C-terminal lobe of Are11.

12. Population genetics of freshwater pearl mussel (*Margaritifera margaritifera*) in central Massachusetts and implications for conservation

Presenter: Stefanie Farrington

Department: Biology

Adviser: John Gibbons

The freshwater pearl mussel *Margaritifera margaritifera* is an ecologically-important globally-endangered species, yet little is known about the North American biodiversity and population genetics. Habitat fragmentation, including damming, may facilitate genetic drift and lower genetic diversity, and has been linked to population declines in Europe. In order to examine the local population genetics of *M. margaritifera*, we generated 300 informative single nucleotide polymorphisms (SNPs) from 59 individuals across 6 geographic populations in central and eastern Massachusetts, USA, using the RAD-seq approach. These 6 populations were located in varying stream systems and separated by dams. Population structure predictions using Discriminant Analysis of Principle Components (DAPC) and fastStructure both indicate the existence of a single genetic population. This hypothesis is supported by frequency-based population genetics calculations performed using GenAlEx, indicating near-complete admixture and a high number of migrants. Our results suggest that the effects of habitat fragmentation from damming in the past century have not radiated through populations of *M. margaritifera*, potentially due to the species' long generation time. However, the population has similar genetic diversity to endangered populations in Europe, and conservationists should be wary of considering populations in North America to be excluded from endangerment concerns

13. Crossroads: Student-Athletes' College Selection and College Advising Process

Presenter: Connor Guerin

Department: School of Professional Studies

Adviser: Kevin McKenna

The high school student-athlete population continues to rise and use athletics as a gateway to college admission more than ever. Academic advisors provide necessary guidance for students-athletes once they reach college. This poster, entitled Crossroads: Student-Athletes' College Selection and College Advising Process, will summarize my honors thesis research that focused on the effects of division rank and reputation of colleges on recent high school graduates who transitioned to college. Analyses from past interviews, along with recently conducted follow-up interviews, will be discussed to inform strategies for supporting student-athletes post-high school athletic involvement. Improvements and strategies to incorporate student-athletes past sporting experiences in their academic and personal planning can be made through advising efforts by academic advisors.

14. Attributing Variability in Maize Yield

Presenter: Michael Cecil

Department: Geography

Adviser: Lyndon Estes

Variability in crop yield has important implications for food security in sub-Saharan Africa. In the context of climate change adaptation, much of the focus on agricultural decision-making has been on inter-annual decisions, such as crop selection and how much land should be farmed. However, farmers also make significant decisions during the course of individual seasons in response to intra-annual variability in precipitation. This study quantifies the effect within-season management decisions have on yields relative to the effect of intra-seasonal weather variability. In this study, we attribute maize yield variability to three factors: (1) land management (planting date, fertilization); (2) intra-seasonal climate variability; (3) soil and topography, using the Decision Support System for Agrotechnology Transfer (DSSAT) cropping system model. We quantify the percent of variability in maize yield that can be attributed to factors within farmers' control (planting date, fertilization, and potentially cultivar selection), versus the variability that is caused by within season weather (e.g. drought or flood events), or soil conditions. This study uses historical weather data in Zambia's Southern Provinces to simulate a wide range of variability in yearly climate. We also plan to incorporate

other data sources, including farmer responses to mobile phone surveys (SMS data), environmental pod sensors, and agricultural sensor data to create more realistic simulations. The SMS data will be used to compare farmers' perceptions of precipitation variability to other data sources and also compare expected and simulated maize yield.

15. Does the distribution of juvenile tree planting impact local air temperature? A calibrated microclimate simulation in Holyoke Massachusetts

Presenter: Meyru Bhanti
Department: Geography
Adviser: John Rogan

Holyoke is a post-industrial city in western Massachusetts facing rising summer and winter energy costs in its older housing stock neighborhoods, partly due to low tree canopy cover. The Massachusetts Department of Conservation and Recreation's (DCR) Greening the Gateway Cities (GGC) program seeks to increase existing tree canopy cover by 10% in selected environmental justice neighborhoods of 26 underserved cities. Within Holyoke, a former pulp paper-manufacturing hub, the DCR planted 1,678 trees on private and public lands between 2015 and 2017. This study will explore the effects of the spatial distribution of tree planting on the local microclimate, in order to provide tree planting recommendations for the active GGC planting program. In situ climate station data were used to simulate local air temperature using ENVI-met a three-dimensional microclimate simulation model. A representative residential housing block was chosen for analysis and five different planting scenarios were explored using two temperature projections: typical August air temperature and a 30-year temperature projection (3°C increase). Five simulations were considered: (1) 0% canopy coverage; (2) existing coverage as of 2017; (3) assumes no new trees were planted in 2015-2017; (4) only trees on public streets are planted; (5) optimal planting in which streets are planted to maximum capacity and all residential trees are planted on the south and southwest sides of buildings. Understanding the effects that the spatial distribution of planting has at a microclimate level can guide future planning.

16. Contested Resources Management in Jamaica's Forests

Presenter: Alex Moulton
Department: Geography
Adviser: James McCarthy

This poster presents findings of a research project examining the politics of environmental resource management involving the Jamaican government and Maroon communities. Government-Maroon negotiations are shown to be contentious encounters where notions of sovereignty, home and anti-hegemonic praxis are negotiated. The presentation explores how these encounters are mediated by and re-produce racial geographies, and considers the emancipatory possibilities of Maroon environmental social movements.

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