



4TH ANNUAL

2021 EARLY CAREER RESEARCH SYMPOSIUM

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Research Symposium

WELCOME

FROM YOUR VICE CHANCELLOR FOR RESEARCH,
ECONOMIC & COMMUNITY DEVELOPMENT

Dear Colleagues,

I am delighted to welcome you to the fourth annual Early Career Research Symposium presented by the Office of Research, Economic & Community Development.

This event celebrates the emerging research programs of early career faculty at the University of Missouri-St. Louis. Additionally, the symposium speaks to the importance of research to our mission as a public, research university and to our growing role of applying research to solve critical urban and social problems that face our region, the nation, and the world.

Such research increasingly involves collaboration across disciplines and the need to work with multiple academic and community partners. Much of the research you will hear about today is the result of rich collaborations across campus, across the region, and around the world. Today's event is a great platform for finding new collaborators. I encourage you to connect with the speakers at the networking reception following presentations.

This afternoon you will hear about research that **employs novel technologies and community-based methods to reduce racial inequities in addiction, investigates the effectiveness of crisis call centers on suicide, explores the nature of publicness, and exciting new uses of deep learning and prediction to improve human health**, plus many more exciting and promising areas of research.

To our presenters: thank you for sharing your research with the UMSL community today and for taking time to prepare abstracts and slides for this event and to network with colleagues. The Office of Research, Economic, & Community Development is here to help you advance your research by helping you apply and successfully compete for extramural funding.

To our audience: Thank you for coming out to support our early career faculty and to celebrate the outstanding research occurring at UMSL.

Enjoy the talks and the conversations that follow.

Cheers,

Christopher D. Spilling

Vice Chancellor for Research, Economic & Community Development



Christopher D. Spilling,
PhD, CChem, FRSC
Vice Chancellor for
Research, Economic &
Community Development

Novel Approaches to Improving Physical and Mental Health Practice and Outcomes

Developing a variety of deep learning applications for health **Badri Adhikari, Assistant Professor, Computer Science**

I enjoy developing artificial intelligence and deep learning algorithms for human health. My interests range from solving biomedical problems such as 'protein structure prediction' to several attackable-but-unsolved problems related to artificial intelligence. In a project funded by the National Science Foundation, my group researches predicting distances in protein structures, an important problem in the field of structural bioinformatics. In 2020, in an international competition known as Critical Assessment of Protein Structure Prediction (CASP), a distance prediction method we developed, RealDist, was ranked sixth among 100+ participating groups. This is the same competition where DeepMind presented their AlphaFold method and demonstrated how artificial intelligence can be used to solve notoriously difficult and long-standing scientific problems. My group is also currently developing deep learning algorithms to help people practice complex yoga poses and breathing exercises in the absence of an expert. By providing real-time feedback, these software applications will guide new practitioners to perform complex exercises correctly. Similarly, in a separate line of research funded by the National Aeronautics and Space Administration (NASA), we are investigating how reinforcement learning—a powerful machine learning method—can be used to develop algorithms that will allow robots to 'sniff' for gas leakages and move towards the leak source to identify it. Within UMSL, my group has collaborated with colleagues in several departments and we are interested in building new bridges of collaboration. I am also excited that in fall 2022, I will be teaching a new course titled "Principles of effective data plotting and visualization."



Badri Adhikari
Assistant Professor
Computer Science

Dental Health and Dentistry in Ancient Egypt: A Case Study from Deir el-Medina **Anne Austin, Assistant Professor, History**

Several previous studies on ancient Egyptian dental practices have suggested that dentistry was not practiced in Egypt prior to Greek occupation and that modern-day dentistry emerged exclusively through Greek medical practices.

This study combines analysis of ancient Egyptian dentition with



Anne Austin
Assistant Professor
History

medical texts from ancient Egypt to challenge this assumption. I present two cases of possible dentistry from the site of Deir el-Medina—a village inhabited by the families of the workmen who cut and decorated royal tombs during the New Kingdom (1550-1070 BCE) and place them in context with overall dental health from the site. I also discuss Egyptian medical texts related to dentistry and their implications. These skeletal and textual examples demonstrate native Egyptian dental practices that were likely based on Egyptian ideas about medicine that pre-date Greek medicine.



Devin Banks
Assistant Professor
Psychological Sciences

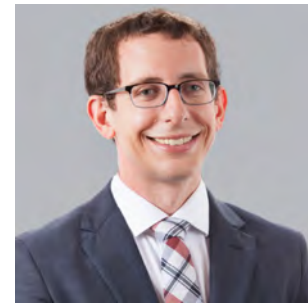
Addressing Racial Inequities in Overdose: Integrating Technology & Community-based Strategies
Devin Banks, Assistant Professor, Psychological Sciences

Black Americans currently face stark inequities in opioid use disorder treatment services, which contribute to rapidly increasing rates of opioid overdose fatalities among this group across the United States, including in St. Louis. Opioid overdose deaths tend to cluster in areas sharing environmental characteristics such as low access to addiction treatment and high neighborhood deprivation (e.g., income inequality, racial segregation, and deteriorating structures). These social and structural determinants of health contribute to current racial inequities in opioid overdose death and long-persisting inequities in harm reduction and treatment utilization. Community-based efforts have aimed to mitigate the impact of structural determinants of health on opioid overdose among Black Americans by conducting grassroots outreach to low-resourced communities and commissioning peers—people with similar demographic backgrounds and substance use recovery experience. These efforts have been found to improve trust of and access to opioid treatment among Black Americans that community outsiders and traditional medical programs have had difficulty engendering. The current presentation will discuss community-based strategies for reducing inequities in opioid overdose among Black Americans by identifying and targeting underlying structural determinants of health. The presentation will address 1) how community-based research strategies that leverage existing community relationships can help identify structural targets for intervention and 2) how technology can be integrated with those strategies to improve the efficacy of community-based intervention. Such culturally- and community-responsive research methods that value the expertise of those with lived experience have the greatest potential to reduce the burden of opioid overdose death among Black Americans in St. Louis and beyond.

Developing a novel mHealth intervention to target alcohol-opioid co-use in young adults

Rycan Carpenter, Assistant Professor, Psychological Sciences

Alcohol is an under-recognized contributor to the opioid crisis that, when used with opioids, substantially increases the risk of opioid overdose and other use-related problems. Despite clear public health significance, however, no existing intervention targets alcohol-opioid co-use. This gap is especially detrimental to young adults aged 18-25, who have the highest rates of alcohol and nonmedical opioid use and use disorders of any age group, yet rarely receive treatment for either substance. MHealth interventions, which use technology (e.g., smartphone applications) to intervene in daily life are highly accessible to young adults and, thus, can reach young adults not currently in treatment. However, a major obstacle to effective mHealth is creating and maintaining sustained engagement among those who use the intervention. We know little about how young adults who co-use alcohol and opioids feel about mHealth, both in regards to their openness to engage in mHealth and what content they would find helpful. This presentation provides an overview of initial results from a multi-stage project to develop an mHealth app targeting alcohol-opioid co-use in young adults. One hundred and twenty young adults engaging in regular alcohol-opioid co-use reported on their views of mHealth and different potential mHealth features in a variety of domains. Findings will inform the development of an adaptive mHealth intervention founded on principles of motivational enhancement therapy and cognitive behavioral therapy that can deliver tailored micro-interventions when they are needed most to help prevent and reduce alcohol-opioid co-use.



Rycan Carpenter
Assistant Professor
Psychological Sciences

Medical Sexism

Jill Delston, Associate Teaching Professor, Philosophy

Doctors routinely deny patients access to hormonal birth control by requiring patients undergo unrelated and unnecessary STD testing like Pap tests. Evidence suggests between 50% and 97% of physicians engage in this practice. It continues despite the fact that the CDC, U.S. Preventative Services Task force, and American Cancer Society all recommend against added tests for contraception access. The practice even constitutes medical malpractice. It also defies moral standards: it upends patient autonomy, damages informed consent, undermines the doctor-patient relationship, and denies health care rights and reproductive rights.

Why do doctors violate science, law and morality in service of



Jill Delston
Associate Teaching Professor
Philosophy

STD screenings like Pap tests and pelvic exams? Paternalism is largely discredited in medicine, but survives in areas traditionally conceived of as “women’s health.” I argue this fact is not an accident. Paternalism is the expected response to patients not thought to be fully autonomous or who are infantilized, as women often are. I offer a definition of medical sexism: the hierarchy of maleness or masculinity over femaleness or femininity in the medical context. Medical sexism uses medical means or medical ends to uphold, assert, or achieve that hierarchy.

The concept of medical sexism can shed light on other harms patients experience. For example, the fetus is purported to justify overriding patient autonomy in some reproductive health cases. However, since the case of contraception includes the same attitudes, behaviors, and practices, but no fetus exists, we can conclude that medical sexism is a better explanation for the widespread abuse of patient autonomy in reproductive health. I consider abortions, C-Sections, episiotomies, bed rest, and obstetric violence.

I conclude by examining other gendered treatment in the medical field, such as in organ transplants heart disease, breast cancer, and research.



Umit Tokac
Assistant Professor
Nursing

Prediction of the Unplanned and Avoidable Trauma and Surgical Readmissions in South Africa

Umit Tokac, Assistant Professor, Nursing

Unplanned and avoidable readmissions remain a major financial and health cost. Hospital readmission is defined as when a patient who has been discharged is readmitted within a specified time (Dreyer & Viljoen, 2019), normally against a 30-day readmission indicator. Global readmission rates vary from 10% to 25% (García-Pérez et al., 2011) with South African rates from 10% (Dreyer & Viljoen, 2019) and an estimate of about 3% of these being unplanned surgical admissions (Snyders, Swart, & Duvenage, 2020). General surgery readmissions were responsible for 1914 additional patient days (Snyders et al., 2020).

The prediction of readmissions is an important quality initiative that tracks lack of discharge preparation, too early discharge, or sub-optimal care and coordination (Agri et al., 2019). Studies have used retrospective regression analysis to predict avoidable readmissions (Pascal et al., 2020), but the use of an algorithm allows for a prospective process to identify potential patients at risk for readmission. Using an algorithm to identify the potentially preventable readmission rate, a rate of 7% was measured in a

Swiss Study against a validated rate of 7.8% (Agri et al., 2019).

This project will use the prospective surgical Hybrid Electronic Medical Registry (HEMR) database to investigate the readmissions of patients within 30 days. Characteristics of preventable and unpreventable readmissions will be identified to predict readmissions that were potentially avoidable, defined as preventable by a change in clinical decision-making by a clinician under the current standard of care. Additionally, the project will create an algorithm by using natural language processing and random forest algorithms to predict patients' readmission within 30 days. Once the algorithm is created, clinicians will not only use the algorithm to predict the probability of their patients' readmission, but the quality of the admission process will increase. It will discern which additional data should be collected from patients to increase the prediction accuracy of readmission.

Using a broader conceptualization of organizational publicness to understand public outcomes: Exploring behavioral health managed care organizations
Sapna Varkey, Assistant Professor, Political Science

This study examines publicness in local management entities-managed care organizations (LME-MCOs), to determine whether it influences organizational performance. LME-MCOs perform a vast range of functions that impact both behavioral health consumers (un/under-insured and Medicaid) and providers, making it a primary unit in which to examine performance. These realities task LME-MCOs with significant responsibilities, as effective care can result in improved health outcomes (Heinrich & Fournier, 2004) and the efficient use of resources (i.e., lower costs per unit of service) (Goldman, McColloch, & Sturm, 1998) could extend the capabilities of current public funding levels. This study uses Moulton's (2009) realized publicness framework in conjunction with the primary influences that make an organization public (political authority, horizontal engagement, and public engagement) (Merritt, 2019) to determine: Whether, and to what extent, publicness affects organizational performance? This study shows how public value institutions and the primary influences that make an organization public can be used together to examine realized publicness. Quantitative results show publicness factors are statistically significant, and associated with consumer and provider outcomes. Traditional publicness measures, like public funding, remain relevant and are positively associated with consumer and provider outcomes. Other measures, like horizontal engagement, transparency, and public priority, are significantly associated with both consumer and provider outcomes. Results



Sapna Varkey
Assistant Professor
Political Science

show increased levels of publicness are not always associated with better outcomes for consumers and providers. Ultimately, results indicate that public value institutions (regulative, associative, and cultural cognitive) are important in this context and should be taken into account in publicness research moving forward.



Hannah White
Assistant Professor
Psychological Sciences

Family Dynamics, Attention, Stress, and Immune Function in Infancy

Hannah White, Assistant Professor, Psychological Sciences

Infants are far from self-sufficient so it is easy to underestimate how much their own behaviors can impact how they experience their early environments. For example, immediately following birth infants are able to channel their cognitive resources by controlling their visual attention. Such attentional control is a cognitive skill that is central to various theories of development and associated with a host of developmental outcomes from academics to mental health. My previous work has found that attentional control can buffer the association between stability in the home environment (indexed by adherence to routines) and infant stress (basal cortisol). However, it is yet unknown what parent and infant factors predict adherence to routines in infancy, and how elevated stress resulting from lower adherence to routines may impact immune system development. I will present on my under review NSF CAREER proposal that will work toward a richer understanding of the consequences of individual differences in attentional control and temperament in infancy by 1) investigating the cyclical relationships between parenting stress, infant temperament, and stability in the home environment, and 2) examining how attentional control can serve as a protective factor in the developmental cascade from home instability to dampened immune system development via infant stress.



Chelsey Wilks
Assistant Professor
Psychological Sciences

Preliminary investigation of callers to suicide hotlines **Chelsey Wilks, Assistant Professor, Psychological Sciences**

Suicidal individuals tend to be out of touch with outpatient mental health treatment. Crisis call centers (CCC) have emerged as a primary treatment option for persons who are suicidal and/or in crisis. Despite the ubiquity of these call centers, limited research exists related to whether consumers of CCCs found the contacts useful and implemented the suggested strategies. Previous research that examined callers of crisis services indicated mixed results on whether the calls were helpful, with some individuals reporting elevated distress in response to contacting the CCC. In the absence of clinical trial data, research

is needed to understand consumer satisfaction and whether individuals implement suggested strategies. Adult callers or texters to a prominent suicide hotline (N=100) were assessed immediately after the call on variables related to the suicide, barriers to treatment, emotion regulation, substance use, the COVID-19 pandemic, and their impressions of the call. Callers were reassessed two weeks later to examine compliance with suggestions from the call. Preliminary results indicate that the plurality of calls were related to reducing suicide (30.2%) followed by overall distress (28%). Over 80% of callers reported that the contact made them feel better. The majority (78%) of the sample reported currently suicidal ideation, while 30% reported a past year suicide attempt. At the two week follow-up, the majority of callers completed most (41.2%) or all (28.1%) of the action plans discussed during the call. Most callers (54.2%) reported that the action plan that was assigned at the previous call was helpful. Data collection is ongoing.

Improving Our Understanding of Violence and Abuse

Of One's Own Making: Leadership Legitimation Strategy and Human Rights

Stephen Bagwell, Assistant Professor, Political Science

Why do states and their agents abuse citizens? Traditional explanations focus on contentious politics, the presence of institutions, and international pressures. Despite this, accounts dissecting the state and its agents in this context of abuse remain largely theoretic in nature. This article offers a breakthrough for within-the-state accounts of human rights abuses by focusing on state leaders and their relationship to broader government institutions and function. We examine where leaders derive their legitimacy from, arguing that leaders relying on their own merits and qualities are less likely to either activate or manipulate institutions of accountability. They also tend to simultaneously ignore broader concerns over human rights abuses. Using data from 1995-2018, we show that the presence of leaders legitimizing themselves within personalist framing can worsen human rights conditions.



Stephen Bagwell
Assistant Professor
Political Science



Annah Bender
Assistant Professor
Social Work

Interpersonal violence and the LGBTQ+ community

Annah Bender, Assistant Professor, Social Work

Interpersonal violence, which may include intimate partner violence and sexual assault, is one of the major pathways to post-traumatic stress disorder, especially among women. Relatively little research has focused on the dynamics of interpersonal violence experienced by lesbian, gay, bisexual, transgender, queer and other gender expansive (LGBTQ+) individuals. In this brief presentation, I will share findings from an analysis of National Crime Victimization Survey data which was one of the first papers to estimate the prevalence of interpersonal violence directed at lesbian, gay, and bisexual individuals using nationally representative data. I will also provide preliminary findings of sexual assault victimization reported by LGBTQ+ students at UMSL in the years 2015-2019. This research aims to provide a clearer lens on a persistent social problem that affects the LGBTQ+ community, although many questions remain—among them, how healthcare and justice systems can effectively address the needs of LGBTQ+ survivors.



Kelsey Cundiff
Assistant Professor
Criminology and Criminal Justice

Homicide Hot Spots in San Francisco: Changes Over Time & Space, 1849-2003

Kelsey Cundiff, Assistant Professor, Criminology and Criminal Justice

Several criminological theories can explain why certain locations are more prone to crime than others, particularly areas and places that have such high concentrations to be dubbed “hot spots.” While prior research has established several factors that predict where hot spots will emerge, much of it has not examined the geographic stability or mobility of these over time. The current study employs kernel density estimation in analyses of San Francisco homicide to explore whether and how hot spots of homicide move within the city from 1849 to 2003. Overall, while we observed minor spatial shifting as well as periodic growth and contraction, we found several remarkably stable hot spots that consistently had high concentrations of homicide over the period, and a number of newer hot spots also emerged. These patterns are likely a reflection of populations trends and historical events in the city of San Francisco over the time period.

Training for War: Academy Socialization and Warrior Policing **Samantha Simon, Assistant Professor, Criminology & Criminal Justice**

The role of the police in the United States is a topic of contentious debate. Central to this debate is a binary that constructs police

officers as fulfilling either a protective, community-serving role, or an aggressive, crime-fighting role. The most recent iteration is reflected in the warrior-guardian construct, which conceptualizes officers as both initiators of, and defenders against, violence. This article examines how the warrior-guardian frame-work shapes police training, and highlights how this construct is itself gendered and racialized. I draw on one year of ethnographic field work at four police academies and 40 inter-views with police officers and cadets to argue that police training is an organized effort to condition officers to conceptualize their relationship with the public as a war. Three components constitute this framing: (1) instructors construct an evil, unpredictable enemy; (2) cadets are taught to identify their enemy in gendered and racialized ways; and (3) cadets are encouraged to adopt a warrior mentality. I show that cadets are taught to view the world in a way that pits them against an enemy, pushes them to conceptualize their enemy as a man of color, and to think about violence as a moral necessity.



Samantha Simon
Assistant Professor
Criminology and Criminal Justice

Tools for Civil Discourse

Critical Civic Literacy

Shea Kerkhoff, Assistant Professor, Educator Preparation and Leadership

Civic discourse today seems to be based more on political leanings than scientific or historical evidence (Alesina et al., 2020). Our aim is to help citizens enter conversations with the tools for productive discourse, specifically, to be able to evaluate sources, weigh the evidence, make reasonable decisions, communicate effectively, and take responsible action. While teaching civic discourse has typically been reserved for the history classroom, we argue that many of the grand challenges facing society today require science literacy and critical media literacy. Our study investigates teaching social studies, science, and language arts using the C3WP stance (NWP, 2015; i.e., inquiry-based reading and source-based writing for college, career, and community preparation). The C3WP has three core features (1) argumentation instructional resources for grades 4-12, (2) source-based writing formative assessment, and (3) professional development for preservice and inservice teachers. C3WP frames writing in college, career, and community as based in argument discourse. To this framework, we add critical civic literacy, which acknowledges that communication in contemporary communities is highly digital, requiring critical media literacy, and it is political, requiring



Shea Kerkhoff
Assistant Professor
Educator Preparation and
Leadership

epistemological understandings of the disciplines of science and history to determine credibility of evidence. Using quasi-experimental design, we investigate whether learning from a C3WP stance improves the critical civic literacy outcomes of creating claims based on credible evidence, communicating using civil discourse, and taking socially responsible action. The hope is to create an evidence-base for teaching in the major content areas of social studies, science, and language arts that results in productive public discourse and responsible civic action.

Examining Educator Experiences to Improve Educational Policy and Practice



Andresa De Souza
Assistant Professor
Educator Preparation and
Leadership

Needs Assessment of South African Educators' Knowledge of Early Childhood Development and Practices

Andresa De Souza, Assistant Professor, Educator Preparation and Leadership

Worldwide, low-income countries have shown higher prevalence of early childhood developmental delays than high-income countries. Early childhood is a crucial period to a child's brain growth and development; enhanced and stimulating environments can promote faster and optimum age-appropriate development. Therefore, it is crucial to ensure that caregivers and day care educators have the proper understanding of activities that can promote the development of expected milestones. Limited literature exists that generate a mixed methods approach of evidence-based findings on practitioners' educational practices and knowledge of early childhood in children between the ages of 3 months to 2 years. While existing literature has been predominantly qualitative or quantitative, it is difficult to compare studies without synthesising the evidence in a South African educational setting. Furthermore, the socio-economic climate of low-to-middle and middle-to-high income communities may endure varying experiences of providing pedagogical practices for children between the ages of 3 months to 2 years. This study takes on a multi-phase approach consisting of a needs assessment for Phase 1, as well as the development, implementation and evaluation of an educational curriculum for Phase 2 and 3. An explanatory sequential mixed methods design consisting of two distinct interactive phases, namely, an initial quantitative phase and the follow-up qualitative phase. A total of 301 participants will be recruited for an online survey and a semi-

structured individual interview. Data will be analysed by means of descriptive statistics for the quantitative evidence; and qualitative evidence will be transcribed by means of intelligent verbatim and thematically analysed. These results will inform the development of a curriculum to train practitioners on the implementation of appropriate age and evidence-based education strategies for early childhood development.

“I don’t know what to tell you.” Discrimination Experiences of Early Career Mental Health Professionals in the Workplace
Erin McClure, Assistant Professor, Educator Preparation and Leadership

What obstacles do early career school mental health professionals face at work, and how can we best support them? This presentation will explore this question through preliminary data from a qualitative research study designed to understand K-12 mental health providers’ experiences with racism and other forms of discrimination in the workplace, with a specific focus on early career Black women.

Participants included 10 women in K-12 school psychology and school counseling roles from across the country. All participants were in their first 6 years of practice, and they had an average age of 31.8. Each participant completed a 30-72 minute individual interview via zoom, and the subsequent data analysis was grounded in a transcendental phenomenological approach.

Results from the interviews were explored by the researchers through the lens of four key themes: (a) Affinity and Advocacy (b) Experience with Discrimination, (c) Personal Impact of and Response to Discrimination, and (d) Workplace Support in Response to Discrimination. Intersectionality Theory (Crenshaw, 1991) was used in the critical examination of the data to underscore the importance of understanding race and gender in combination rather than in isolation, and to consider the compounding effects of discrimination that individuals with multiple intersecting identities often endure.

Preliminary data from the study indicated that the participants were passionate about advocating for all students and liberating marginalized students from oppressive school structures. However, participants’ own experiences with personal discrimination impacted their personal wellbeing and job satisfaction. The women utilized several strategies to cope and push for change, such as reporting incidents to human resource personnel. Yet, people in power precluded their efforts and the emotional toll led some participants to question whether they should transition to a



Erin McClure
 Assistant Professor
 Educational Sciences and
 Professional Programs

new field of practice.

Findings from this study support additional calls for increased attention to practitioners of color in school mental health fields, especially those who are vulnerable due to their intersectional identities.



Magen Rooney
Assistant Professor
Educator Preparation and
Leadership

Teacher's Perceptions of Work-Based Learning Experiences for Students with Severe Disabilities

Magen Rooney, Assistant Professor, Educator Preparation and Leadership

This study investigated teachers' perceptions of the benefits and barriers to school and community work-based learning experiences (WBLEs). High school special education teachers who had at least one student on their caseload with severe disabilities aged 14 or older completed an online questionnaire (N = 137). Exploratory factor analyses were used to describe how teachers conceptualize benefits and barriers to school and community WBLEs. In addition, inferential statistics were used to compare teachers' perceptions of school and community WBLEs. Two types of benefits of WBLEs were identified: student skills and student outcomes. According to teachers, student outcomes was a greater benefit of community WBLEs than school WBLEs. Teachers who had experience with school WBLEs believed that benefits of school WBLEs were greater than teachers who did not have experience with school WBLEs. There were also four types of barriers to WBLEs: resources, curriculum, stakeholder support, and supporting students. Of these barriers, teachers rated barriers to stakeholder support and supporting students significantly higher for community WBLEs than school WBLEs. Teachers who did not have experience with community WBLEs rated barriers to community WBLEs higher than teachers who did not have experience with community WBLEs. Implications for how additional research can gain a better understanding of how students benefit from WBLEs and how to address barriers will be discussed. Additionally, implications for how teachers and schools can use data from this study to plan WBLEs and address barriers will be discussed.

Predicting Patterns and Uncertainties in Housing, Weather, and Employment

Impacts of extreme weather events on mortgage risks and their evolution under climate change: the case of Florida **Timothy Dombrowski, Assistant Professor, Finance**

We develop an additive Cox proportional hazard model with time-varying covariates, including spatio-temporal characteristics of weather events, to study the impact of weather extremes (heavy rains and tropical cyclones) on the probability of mortgage default and prepayment. We estimate the model on a portfolio of mortgages in Florida, consisting of 69,046 loans and 3,707,831 loanmonth observations with localization data at the five-digit ZIP code level. We find a statistically significant and non-linear impact of tropical cyclone intensity on default as well a significant impact of heavy rains in areas with large exposure to flood risks. These findings confirm existing results in the literature and also provide estimates of the impact of the extreme event characteristics on mortgage risk, e.g. the impact of tropical cyclones on default more than doubles in magnitude when moving from a hurricane of category two to a hurricane of category three or more. We build on the identified effect of exposure to flood risk (in interaction with heavy rainfall) on mortgage default to perform a scenario analysis of the future impacts of climate change using the First Street flood model, which provides projections of exposure to floods in 2050 under RCP 4.5. We find a systematic increase in risk under climate change amounting to 1 percentage point in average and much more pronounced in the tail of the distribution, with an increase of 7 percentage points of the default probability at the 99th percentile of the mortgage distribution.

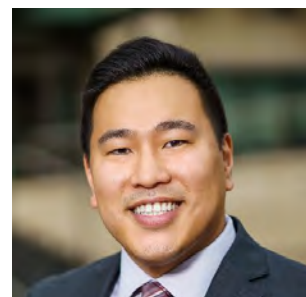


Timothy Dombrowski
Assistant Professor
Finance

Employment Reconciliation and Nowcasting **Eiji Goto, Assistant Professor, Economics**

The monthly release of employment data for the U.S. includes two different estimates from two different surveys. One is based on a survey of establishments (payroll) and the other is based on a survey of households. The presence of two different sources of information on broadly the same theoretical concept leads to an obvious question: can we combine the information to obtain an improved estimate of employment?

In this paper we build on the research on combining different measures of output to instead combine different measures of employment. We construct a latent employment estimate which reconciles the information from the two separate surveys as



Eiji Goto
Assistant Professor
Economics

well as incorporating the preliminary data revision process of the payroll data. We find that our reconciled latent employment series looks different than the initial release of payroll employment and is closer to the fully-revised data (benchmarked to a near census of employment), particularly during the Great Recession. Once we move to a real time exercise, however, our findings suggest that the reconciled employment estimate is remarkably similar to the initial release of payroll employment with near zero weight on the household survey information.



Elaina Johns-Wolfe
Assistant Professor
Sociology

The Geography of Gentrification: Changes in Neighborhood- and City-Level Effects of Racial and Ethnic Composition on Gentrification in U.S. Cities, 1980 to 2017
Elaina Johns-Wolfe, Assistant Professor, Sociology

An understudied but important aspect of gentrification is the extent that it transforms the racial and ethnic composition of neighborhoods. Gentrification involves the socioeconomic, social, and physical transformation of neighborhoods, yet sometimes connotes concurrent racial transition, in which White gentrifiers, state and corporate actors, and institutions invade Black, Latinx, or Asian neighborhoods. However, scholarship on how neighborhood racial composition influences which poor neighborhoods gentrify has generated mixed conclusions. Some describe gentrification as being tantamount to racial transformation, as described above, while others suggest that White gentrifiers avoid minority neighborhoods, thereby reinforcing racial residential segregation. I investigate two potential sources of this lack of consensus—city-level spatial and temporal factors that might shape where gentrification occurs. Using hierarchical linear modeling (HLM), I analyze data from the 1980-2010 decennial censuses and the 2010 and 2017 American Community Survey 5-year estimates to assess whether city-level racial residential segregation and housing market tightness affect where gentrification occurs. My findings largely reflect White homeseekers' aversion to residing in neighborhoods with high shares of Black and Latinx residents, as these neighborhoods initially have low probabilities of gentrifying to a majority of White residents. However, I show that these patterns are shaped significantly by racial segregation and housing market pressures and have changed over time. Indeed, gentrification occurs in more diverse neighborhoods over time, especially in cities with tighter housing markets and less segregation.

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