

GSAW 2026: Scholarly Forum

Presentation Abstracts

Session II – Arts & Humanities, Physical Sciences and Social & Behavioral Sciences

12:30pm – 2:00pm

Arts & Humanities

1 - Taynara Alcântara Cangussú, “AI-Mediated Translanguaging in Multilingual Education: A Systematic Literature Review (2022-2025)”

Translanguaging pedagogy seeks to foster linguistic equity by legitimizing learners’ full linguistic repertoires in educational practices (García, Johnson, & Seltzer, 2017). Despite its demonstrated benefits, teachers continue to face challenges in implementing translanguaging practices effectively in multilingual classrooms (Wang & Ai, 2024). At the same time, emerging discussions suggest that Artificial Intelligence (AI) may support translanguaging by creating adaptive, multimodal, and inclusive learning environments (Almashour et al., 2025; Donley, 2024; Yang & Lin, 2025). To investigate this intersection, the present literature review examines: How is AI being used to support translanguaging practices in multilingual and EFL educational contexts? What challenges, benefits, and emerging trends does the literature identify regarding AI-mediated translanguaging pedagogy? This study followed the systematic review procedures outlined by Antonelli and Sembiante (2022), informed by PRISMA guidelines (Page et al., 2021) and Boote and Beile’s (2005) framework for literature reviews. A systematic literature review was conducted following Antonelli and Sembiante’s (2022) protocol for applied linguistics searches and PRISMA 2020 guidelines. Three consecutive searches in ERIC, Google Scholar and PsycINFO using terms related to artificial intelligence, translanguaging pedagogy, multilingual contexts, and linguistic repertoires were carried out. After screening all records for relevance to AI-supported multilingual or translanguaging practices and applying exclusion criteria, 12 peer-reviewed studies were selected for full analysis and thematic synthesis. Findings reveal emerging patterns in how AI mediates translanguaging pedagogy, including its potential to scaffold multilingual meaning-making, expand learners’ access to linguistic resources, and support teacher decision-making. At the same time, the literature highlights equity concerns, teacher preparedness challenges, and the need for pedagogically grounded frameworks to guide AI-supported translanguaging practices.

2 - Grace Seng Ing Dashi, “Extractive Frontiers under Fragmented Sovereignty: Women's Lived Realities in Critical Mineral Mining and Armed Conflicts Zone of the Kachin State, Myanmar”

The accelerating global demand for rare earth elements used in electric vehicles, wind energy, and advanced technologies is transforming mineral frontiers worldwide. Kachin State in northern Myanmar, bordering China’s Yunnan province, represents one such frontier. Since the 2021 military coup, it has rapidly become a critical extractive frontier within global Chinese-linked mineral supply chains. The expansion of heavy rare-earth mining, driven by global demand for materials essential to renewable energy technologies, has intensified amid fragmented sovereignty and growing division among the military junta, Ethnic Resistance Organizations, militias, and transnational Chinese economic actors. This paper examines extractive mining in Kachin State not only as an environmental or economic issue, but also as a form of governance that redistributes risk, responsibility, and social costs within the China-Myanmar borderlands.

Drawing on semi-structured interviews and secondary documents analysis, this paper adopts a collaborative, community-based approach, treating participants as knowledge contributors and sharing findings to aid local efforts. By centering grassroots actors within the broader political economy, the research incorporates anonymized qualitative accounts from women in conflict-affected frontline communities, particularly those of Kachin Independence Army soldiers’ wives and widows, to illustrate how these contradictions unfold on the ground. Preliminary findings suggest that the expansion of rare-earth mining may be intensifying pressure on fragile reproductive health infrastructure in conflict-affected areas. Emerging patterns indicate that women’s unpaid volunteer labor is increasingly helping close gaps in formal governance, particularly in maternal care services. Interviews further suggest tensions between reproductive expectations, limited medical capacity, and environmental risks associated with extractive activities. Rather than isolated challenges, these dynamics appear structurally linked to broader political-economic transformations in Myanmar’s borderlands. The study anticipates demonstrating how women’s social reproduction labor underwrites both extractive expansion and conflict-era governance in resource frontiers. As a researcher with regional ties to Kachin State, I conduct this study through a reflexive, community-informed approach, balancing insider access with critical distance to ensure ethical rigor in a conflict-sensitive research environment.

3 - Desiree Dawson, "Beyond Survival: Lucumí Syncretism, Counter-Hegemony, and the Black Radical Tradition"

Lucumí, also popularly known as Santería, is an African diasporic religion that is often syncretized with Catholicism. Its emergence under colonial domination and racial capitalism situates it as a site of struggle beyond merely a religious practice. Dominant understandings of religious syncretism frame it as non-purposeful or hidden. Previous research has primarily emphasized survival without politics, thereby diluting the purposefulness of Lucumí.

It is important to understand that Lucumí syncretism constitutes an active politics of resistance and belonging through its engagement with hegemonic power and, therefore, counter-hegemonic practice. This level of contention is anchored in Antonio Gramsci's theory of hegemony and Cedric Robinson's theory of Black radical thought, which positions Lucumí syncretism as a counter-hegemonic practice. Lucumí practices function as spaces of belonging under domination, particularly when focused on Orisha worship. These findings expand how we understand resistance beyond overt protest, positioning culture as a central terrain for political struggle within Africana studies.

Therefore, this paper examines counter-hegemonic practice and Black radical thought, connecting these expansive theories to the niche practices of Orisha syncretism. In doing so, it allows scholarship to re-situate Eurocentric theoretical frameworks within Africana traditions, contributing to the decolonization of political theory and political science terminology that has historically been shaped by Eurocentric understandings. It's important to not only reframe syncretism as unpurposeful or passive blending, but as a recurring conceptual process. One that reflects ongoing practices of adaptation, continuity, and resistance within African diasporic worlds.

4 - Maria Galiano, “Negotiating Meaning Across Languages: Translingualism in Higher Education Digital Media”

University digital spaces often function as primary sites of first contact for many students, leading them to shape perceptions of belonging and access within the context of the universities. In this way, institutional messaging can either reinforce or complicate the perception that students have on their use of language and feelings of inclusivity in university spaces. Institutional digital discourse, such as university websites and their social media, are mostly examined through a lens of recruitment or marketing. Yet these digital discourses remain unexplored through a translingual lens, which primarily takes a close look at classroom practices and language use. There is limited understanding of how institutions negotiate linguistic diversity in digital spaces meant to promote or inform students about different aspects of an institution. Through an analysis of a writing center’s website and selected social media posts, this study seeks to examine institutional digital discourse, drawing on translingual theory from Canagarajah and Horner et al., to showcase how linguistic inclusivity and translingual values are represented in institutional digital spaces. This study employs a qualitative, theory-informed deductive research design to examine how linguistic inclusivity and translingual values are represented at a writing center, using multimodal discourse analysis to examine how institutional meanings are produced across textual and visual modes. The analysis focuses on publicly available institutional texts that function as public-facing representations of institutional identity and values. Results reveal that while multilingualism is symbolically acknowledged, it is unevenly integrated into the center’s primary digital identity. The website constructs inclusivity through broad institutional language and affective descriptors, whereas Instagram—managed by peer tutors—more visibly enacts relational and dialogic values aligned with translingual principles. These platform differences demonstrate how translingual values are distributed disproportionately across institutional digital spaces. This study extends translingual scholarship beyond classroom pedagogy to institutional digital discourse, highlighting how language ideologies are publicly constructed in university branding and communication practices. This research offers practical implications for writing centers seeking to align digital communication with commitments to linguistic justice and multilingual representation.

5 - Romayrie Anastasia Legoute, "Conflict, Gang Violence, and Girls' Education in Haiti: Historical Legacies and Contemporary Challenges"

Armed conflict and gang-imposed displacement in Port-au-Prince, Haiti, have profoundly disrupted educational systems and constrained the life trajectories of women and girls. School closures, chronic insecurity, and forced displacement interrupt learning and limit access to stable educational opportunities. To understand these current conditions, this paper situates contemporary violence within Haiti's broader historical and political development. It presents a historiographical review that connects the Haitian Revolution, France's economic exploitation through indemnity payments, the 1915 United States occupation, and the long-term structuring of Haiti's education system to present inequalities in girls' educational access.

The purpose of this review is to examine how historical and political forces have shaped Haiti's education policies and how these structures continue to influence physical access to schooling, girls' participation, and political representation. It asks: What issues impact girls' education in Haiti? What does existing literature identify as the root causes of limited access and persistent inequality?

Using a historiographical approach, the review analyzes peer-reviewed scholarship, policy documents, and historical accounts to trace patterns across time. The literature shows that post-revolution debt, foreign intervention, centralized governance, weak public investment in education, and reliance on private and religious schools have shaped unequal access. Research also highlights barriers related to poverty, infrastructure, gender norms, safety concerns, and limited political representation of women.

This review argues that understanding present educational disruption requires connecting historical exploitation, state formation, and gender inequality to current instability. By identifying gaps in the literature and foregrounding the need to center Haitian girls' and women's voices, this paper contributes to scholarship on conflict, gender, and education and informs future qualitative research grounded in lived experience.

6 - Lydia K Mallah, “Intersection of Education and Livelihoods: Community Interventions for Education Retention in Post-Conflict Liberia”

This project is an integrated intervention aimed at addressing the high rate of school dropout among children in rural Liberia. The initiative responds to a critical need in post-war Liberia, where poverty, gender-based violence (GBV), and economic vulnerability continue to hinder access to education, particularly for children and youth.

In Liberia, many children leave school due to the economic challenges their parents face in meeting basic educational costs. This issue is more acute in female-headed households affected by GBV and lacking stable sources of income. Based on baseline data collected in rural communities in Nimba County, the project was designed with a dual-intervention strategy: (1) reintegrating 80 out-of-school children through direct educational support, and (2) empowering 67 vulnerable single mothers with sustainable livelihood skills in agriculture, cooperative farming, financial literacy, and safeguarding training.

The intervention employed a community-based, participatory approach and was guided by Intersectionality Theory, which considers how multiple identities (e.g., gender, poverty, trauma) compound exclusion. Data collection included three qualitative focus group discussions with project beneficiaries, community volunteers, and schoolteachers, alongside document analysis of attendance and enrollment records to assess school retention.

Preliminary findings showed minimal absenteeism, with a 94% retention rate among participating children. Single mothers reported increased economic empowerment, improved ability to support their children’s education, and higher confidence in addressing GBV.

Challenges included limited funding for tool replacement and insufficient resources to provide additional training in entrepreneurship, GBV, and human rights. Future iterations could expand to more families and integrate Village Savings and Loan Associations (VSLA) for sustainability.

This project highlights the potential of combining educational support with livelihood interventions as a scalable, community-driven solution for dropout prevention in post-conflict settings. It demonstrates that addressing structural vulnerabilities through holistic interventions can produce measurable educational and social outcomes. Findings offer practical guidance for policymakers, donors, and practitioners seeking to replicate such programs to promote inclusive education, family empowerment, and community resilience.

Key Words: School dropout, Livelihood interventions, Education retention, Post-conflict Liberia

7 - Laura Milan Serret, "Behind, Beside, and Upon the Throne: Powerful Women of Imperial China"

China, whose history spans more than 5,000 years, is predominately a patriarchal and patrilineal society. As a result, Chinese Imperial history is often narrated through a rigidly patriarchal lens in which women appear either as passive victims of Confucian ideology or as a dangerous anomaly who disrupted the political order. However, throughout the country's long history, there have been periods when women ruled or exercised significant political, military, and ideological authority. Ruling in a society where they were not supposed to hold any power raises many questions about why and how they did so.

Focusing on women in China from the Shang to the Tang Dynasty, this research paper focuses on three case studies: Lady Fu Hao of the Shang Dynasty, Empress Dowager Lü of the Former Han Dynasty, and Emperor Wu Zhao, better known as Wu Zetian of the Tang Dynasty. These elite women will be analyzed not as victims or as anomalies, but as fully engaged political actors who understood, navigated, and at times reshaped the foundations of the Chinese state.

The primary research methodology employed is qualitative. Through the historical analysis of both primary and secondary sources, this study will collect the information that serves to analyze the distinct types of female rulings. Using a comparative analytical framework – "Behind, Beside and Upon the Throne"- this research will demonstrate how these women got to exercise the political authority they did in the different structural positions.

The results are that female authority in early Imperial China was neither accidental nor purely anomalous. Although Imperial society was structured around patriarchal and patrilineal norms, women, such as those studied, were able to gain and maintain power across the different dynastic systems. Concluding that women's rulership in pre-imperial and early imperial China was structurally possible, politically strategic, and historically significant.

This project will contribute to broader discussions in Asian studies and gender studies by challenging the simplified narratives of women's marginalization in Chinese history. Moreover, looking into these female rulers as engaged political actors will foster a more nuanced understanding of authority and gender in premodern society.

8 - Temilola Oyenuga, “Assessing the Representation of Emotional Intelligence in Children’s Books: A Rubric-Based Approach”

Enhancing children’s emotional intelligence (EI) has become increasingly important, as emotionally competent and stable children are more likely to achieve academic, social, and lifelong success. Standardized tools such as the Emotional Quotient Inventory: Youth Version (EQ-i: YV), the Levels of Emotional Awareness Scale for Children (LEAS-C), and the Emotion Expression Scale for Children (EESC) have been developed to assess children’s EI competencies and identify areas where targeted support may enhance socio-emotional growth. However, these instruments focus on direct child assessment and do not extend to educational resources that cultivate EI, leaving a gap in evaluating such materials, particularly children’s books. Assessing children’s books on EI is critical, as the proliferation of EI-focused books can overwhelm teachers’ ability to select texts that authentically represent and scaffold EI skills in developmentally appropriate ways.

This study aims to address this gap by introducing the Emotional Intelligence Content Assessment Tool (EI-CAT), a rubric-based instrument designed to evaluate children’s literature for ages 4–8. Grounded in Salovey and Mayer’s Four-Factor Model, EI-CAT aims to assess four dimensions of EI representation: frequency, conceptual accuracy, coherence, and age appropriateness. Using a convergent mixed-methods design, EI-CAT will be applied to 30 purposively sampled children’s books, supplemented with perspectives from 15 early childhood teachers in Miami-Dade and Broward Counties on the strengths, challenges, and broader representations of EI in children’s literature. It is anticipated that the application of EI-CAT will reveal variability in the depth and quality of EI representations across children’s books.

While many books are expected to demonstrate frequent references to emotional processing, fewer are likely to exhibit strong conceptual accuracy, coherence, and age appropriateness aligned with the Four-Factor Model of EI. Specifically, it is expected that emotional perception and expression will be more commonly represented than higher-order skills such as emotional understanding and emotional regulation. Teacher perspectives are expected to highlight the accessibility and popularity of EI-themed books, as well as challenges with appropriate representations. By bridging education, psychology, and children’s literature, this study will provide a novel tool that informs instructional decisions and publishing standards.

9 - Arley Parra, "Imagining Bogotá in 2000: Literary Speculation and Urban Reality in the Work of Soledad Acosta de Samper."

At the end of the nineteenth century, Latin American writers increasingly used speculative narratives to reflect on modernization and the uncertain future of newly consolidated nations. In *Bogotá en el año de 2000: Una pesadilla*, Soledad Acosta de Samper presents a critical vision of Bogotá projected into a distant future, blending social commentary with imaginative speculation. This project examines how her literary portrayal anticipates debates surrounding urban transformation, social inequality, and cultural change. The research seeks to evaluate the extent to which Acosta de Samper's imagined future resonates with Bogotá's historical realities around the year 2000, considering both convergences and divergences between literary prediction and lived experience. The study employs close textual analysis combined with historical contextualization. Narrative descriptions of urban space, social behavior, and moral anxiety are examined alongside secondary historical sources documenting Bogotá's demographic growth, modernization processes, and sociocultural challenges during the twentieth century. This comparative approach situates the text within nineteenth-century intellectual debates on progress while engaging contemporary urban history. Preliminary findings suggest that although many elements of the narrative operate through exaggeration and satire, the text identifies enduring concerns regarding governance, inequality, and urban identity that remain recognizable in modern Bogotá. By approaching Bogotá as a focused case study, the project contributes to broader discussions of Latin American speculative writing as a form of cultural diagnosis rather than mere fantasy. It highlights how literary imagination can function as an analytical tool capable of anticipating social tensions and questioning dominant narratives of progress. Beyond literary scholarship, this research encourages interdisciplinary dialogue between literature, urban studies, and cultural history, demonstrating how revisiting nineteenth-century perspectives can deepen contemporary understandings of urban transformation and the social role of narrative in shaping our understanding of real-world contexts.

10 - Sidra Riaz, "Understanding Multisector Stakeholder Perspectives on Barriers and Pathways to Housing Resilience in the City of Miami"

Despite a growing literature on housing resilience, there is a limited understanding of multisector stakeholder perceptions of barriers to housing resilience. To facilitate more effective collaboration among multisector stakeholders in promoting housing resilience, it is essential to understand how the perceptions of these stakeholders converge or diverge from one another. To address this gap, this study aims to (1) identify the major barriers that impede Miami's housing resilience; (2) assess how these barriers are perceived across stakeholder groups; (3) explain where stakeholder perspectives converge or diverge; and (4) analyze how stakeholders believe these barriers can be overcome. The study is based on the case study of the City of Miami (CoM), one of the most disaster-vulnerable cities in the United States. The primary data collection methods include semi-structured interviews (n=50) conducted with four primary multisector stakeholders: (1) public sector individuals or organizations; (2) private sector individuals or organizations; (3) nonprofit organizations; and (4) academic individuals and organizations. A hybrid coding approach is applied to do thematic coding in NVivo, combining deductive codes based on resilience and housing literature and inductive codes emerging from participant narratives. The barriers that were most frequently discussed by the stakeholders include socioeconomic inequities, insufficient affordable housing supply, chronic flooding risk, sea-level rise, high cost of rebuilding, fragmented authorities, and low awareness of housing risks. While there is a consensus on the barriers, there are some notable differences in the perceptions of stakeholders across different sectors. Environmental and climatic, as well as economic barriers, particularly sea-level rise, chronic flooding, and the cost and availability of affordable housing, were emphasized more by the public sector, while construction-related and regulatory barriers were more of a concern to private sector stakeholders. Social and institutional barriers, including low-quality housing stock, climate-driven displacement, fragmented authorities, weak code enforcement, and socioeconomic inequities, were highlighted more by nonprofit sector stakeholders. Academic stakeholders place more emphasis on the governance barriers. The findings from this study offer insights to policymakers on how they can support sustainable housing outcomes for vulnerable communities and strengthen adaptive capacity and advance equitable resilience in cities vulnerable to disasters.

11 - Natalie Sofia Suazo Hernández, "The River as Plaintiff: Indigenous Water Rights and Post-Colonial Legal Resistance in Honduras"

Who owns the river and who decides how it should flow? This paper examines the post-colonial legal disputes surrounding land and water rights in the case of Honduran environmental activist Berta Cáceres, focusing on the controversial hydroelectric concessions granted on the Rio Gualcarque, ancestral home of the Lenca people. Rather than analyzing Cáceres' activism solely as a struggle for environmental protection, I argue that it constitutes a larger challenge to colonial legal regimes that continue to define territory, property, and resource extraction in Central America. Drawing on Ulrich Oslender's concept of "aquatic space", the spatialized social relationships organized around rivers and water, I explore how water itself emerges as a subject of rights rather than an object of exploitation. Taking into account significant recent developments in environmental jurisprudence most notable the legal personhood granted to the Atrato River in Colombia and the Whanganui River in Aotearoa/New Zealand, the project situates Honduras within a Global South movement for water justice and indigenous sovereignty. Using a combination of Indigenous epistemologies and Cáceres' own words, this paper examines the forms of translation required for Lenca territorial knowledge to become legible within national and transnational legal forums. It ultimately proposes a model of environmental justice aesthetics that destabilizes the colonial separation between nature and property, showing how ecologies of resistance are equally struggles of law, language, and the right to define what and whom a river can be.

12 - Mivheal Tetteh, "Power Redistribution and Economic Empowerment: A Critical Analysis of World Bank Policies in 'Digital Pathways for Education'"

This conceptual analysis examines the power dynamics embedded in World Bank education interventions, with particular focus on the Digital Pathways for Education initiative. Historically, education development strategies in the Global South have been shaped by donor-driven frameworks that prioritize enrollment expansion and financial efficiency over the lived experiences of learners, educators, and communities. While these approaches have increased access, existing literature demonstrates that persistent inequities remain in educational quality, infrastructure, teacher development, and the meaningful participation of local stakeholders (Lopez, Nagashima, & Ackwerh, 2020).

Guided by the human capability approach articulated by Sen (1979, 1999) and Nussbaum (2000), this analysis conceptualizes education as a domain for human flourishing, agency, and freedom rather than solely an economic instrument. From this perspective, international development agendas are assessed based on how power is distributed and how educational initiatives expand or constrain opportunities for empowerment. Research on gender and education indicates that quantitative gains in access alone fail to address structural inequalities such as uneven resource distribution, limited instructional quality, and weak institutional support (Kabeer, 2005; Unterhalter, 2009).

World Bank policy documents frequently define success through measurable indicators such as enrollment growth, digital connectivity, and efficiency metrics (World Bank, 2021; Rajasekaran, Adam, & Tilmes, 2024). However, these indicators often obscure systemic challenges including teacher under-compensation, inadequate professional development, fragile community engagement, and the persistence of rural–urban divides. Scholars of empowerment caution that participatory language within donor-led initiatives often masks asymmetrical power relations, whereby local actors are consulted but rarely granted decision-making authority (Nagar & Raju, 2003).

Four key findings emerge. First, donor agencies retain significant influence over education policy, reinforcing top-down implementation models that marginalize local knowledge. Second, excessive reliance on quantitative indicators fails to capture educational quality, student engagement, or long-term sustainability. Third, insufficient investment in teacher preparation and compensation undermines policy implementation at the classroom level (Amegah et al., 2024). Fourth, although digital interventions hold promise, they risk intensifying inequality without parallel investments in infrastructure, connectivity, and teacher readiness.

In conclusion, while the Digital Pathways for Education initiative represents modernization, it also reveals enduring contradictions within international development frameworks.

14 - Lucas Vieira, "Conquering Language: The "Cowboy" Rhetoric of Imperialism in Owen Wister's *The Virginian*"

(1) Problem Statement: The western genre has been popularized as the perfected vehicle for the national ideas of America: its myth, its culture, and its ideologies. As a result, the genre acts as a representation of the United States' most primal, original objective: the expansion of the frontier. This objective works its way into the tropes of the western, in particular that of a rugged horse-rider "conquering" the wild lands of the West—even if such lands were already inhabited and maintained. (2): Objectives: These tropes became a language that communicates the simultaneous veiled and overtly imperialist nature of contemporary American foreign policy, situated well between the Mexican-American War, the Spanish-American War, the Indian Wars, among countless others. With the genre entering the American consciousness as a form of its people's culture, the western naturally evolved from the social and linguistic development of American progression, influencing Americans bidirectionally: how they understood their identity, as well as how to communicate between themselves and to those originating beyond their borders. This paper explores this resulting language by examining what many consider to be the first serious western novel, Owen Wister's *The Virginian* (1902). (3) Methodology: Using Kenneth Burke's dramatist pentadic analytical framework and terministic screens, this paper analyzes Wister's nonfiction opinion article "The Evolution of the Cow-Puncher" and two specific chapters from the *The Virginian* as evidence to how fictional media is utilized to project Wister's expansionist objectives. (4) Conclusions: In effect, the paper uncovers an early 20th century rhetoric of imperialism designed to be absorbed by American readers and subsequently utilized to advance the American imperialist mission. (5) Contribution: In doing so, we may better contextualize the novel's dialogues with its author's national desires—"Anglo-Saxon" supremacy, embodied masculine strength, and global economic dominance—with what he selects, reflects, and, most damning, deflects ("Evolution" 604). (6) Broader Impacts: By tracing this rhetoric to an origin of the western genre, we may better illuminate a lineage in later political forums and media, including but not limited to the images of "cowboy presidents."

Physical Sciences

15 - Sherin Anto, "Reduction of atmospheric CO₂ to oxalate by a dinuclear copper complex"

The excessive use of fossil fuels and emission of greenhouse gases (primarily CO₂), led to an energy crisis, climate change, and a host of environmental concerns. Concerns about global warming have considerably raised in the last years. The effective way to address these issues is to use CO₂ as a resource to make value-added compounds, reducing its atmospheric concentration at the same time. The reductive conversion of atmospheric CO₂ to value-added chemicals is crucial for sustainable cyclic economy, on one hand mitigating the pollution effects of fossil fuel and biomass burning and providing useful industrial feedstocks, on the other. But converting an environmental pollutant to an organic product is really appealing. Converting CO₂ is not easy due to its high thermodynamic stability. In past years, significant efforts have been made towards CO₂ capture and conversion, focusing mostly on electrochemical methods producing C₁ (e.g. CO, CH₄, CH₃OH, HCOOH) and C₂ products (e.g. C₂H₆, CH₃CH₂OH, etc.), particularly on copper electrode surfaces. However, the formation of oxalates remains less explored due to the rather negative potential of -1.90 V (vs. NHE) required for the direct CO₂ to C₂O₄²⁻ reduction. This work presents the synthesis and study of dinuclear copper(I) complexes oxidized in air by CO₂ rather than O₂ to form oxalate-bridged complexes as the reduction products with remarkable selectivity. Specifically, red DMSO solutions of [(bipy*)Cu(I)(μ-I)]₂ upon exposure to the laboratory atmosphere changes to a dark green [((bipy*)Cu(I))₂(μ-K₂,K₂'-C₂O₄)], clearly indicating the reductive coupling of two CO₂ molecules to form oxalate (bipy* = 4,4'-R₂-2,2'-bipy; R = H, Me and OMe). Complete characterization of the dinuclear oxalate complexes was achieved using FT-IR, UV-Vis, elemental analysis and single crystal X-ray diffraction. Mechanistic insights into the reduction of atmospheric CO₂ were provided by DFT computational methods. Magnetic measurements were made to probe the magnetic exchange within the complex. Furthermore, the impact of bipyridine substituents on CO₂ reduction and release of free oxalic acid from the complexes were also investigated. Thus our studies highlight the development of coordination complexes for catalytic CO₂ sequestration, its selective conversion and use as feedstock in the synthesis of useful organic compounds.

16 - Victor Alvarado, "Evaluation of morphological and physiological responses of snap bean seeds to abiotic stresses"

Snap bean (*Phaseolus vulgaris* L.) establishment in South Florida is highly sensitive to abiotic stresses, particularly increasing temperatures and soil salinity, which can impede germination and early seedling development. As climate variability intensifies and soil salinification becomes more prevalent in subtropical production systems, understanding early-stage stress responses is critical for crop resilience and conservation. This study aimed to evaluate the morphological and physiological responses of snap bean seeds exposed to controlled temperature and salinity stress during the germination phase. Seeds were subjected to five temperature regimes (21, 24, 27, 31, and 35 °C) and four salinity treatments (Electrical Conductivity (ECw) = 0, 4, 8, and 12 dS m⁻¹). Using a completely randomized design (CRD), seeds were incubated in petri dishes lined with germination sheets. Germination was defined as radicle elongation to at least 2 mm and was monitored daily for 15 days to determine germination percentage and rate. Early seedling performance was assessed through radicle emergence and root growth. Results indicated that both elevated temperature and increasing salinity reduced germination performance and delayed germination timing. Higher salinity levels significantly decreased final germination percentage and suppressed radicle growth, while heat stress primarily reduced seedling vigor. Radicle length proved to be a sensitive early indicator of stress intensity across treatments. These findings demonstrate the vulnerability of snap bean establishment under abiotic stresses and demonstrate the value of early-stage morphological and physiological metrics for screening stress tolerance. This work contributes foundational data for controlled-environment stress modeling and provides applied relevance for crops grown in similar conditions. Ultimately, the results support the development and necessity of improved management strategies and cultivar selection approaches to enhance successful crop establishment under increasingly variable environmental conditions.

17 - Sinha Aziz, "Sample Size Requirements for the Central Limit Theorem for Skewed Distributions: A simulation study"

The Central Limit Theorem (CLT) plays a foundational role in statistical inference, often serving as the rationale for assuming a normal approximation of the sample mean. Yet, the pace at which this assumption becomes valid is influenced by the shape of the parent distribution, especially its skewness. This research quantifies the minimum number of observations required for the mean of samples drawn from skewed, non-normal distributions specifically Gamma, Poisson, Binomial, and Beta to achieve a satisfactory normal approximation. We implemented a Monte Carlo simulation and applied both the Shapiro-Wilk and Kolmogorov-Smirnov tests to assess the adequacy of the normal approximation. Results indicate a nonlinear association between the degree of skewness and the sample size required for acceptable normal approximation. For distributions with mild asymmetry ($|\text{skewness}| < 0.5$), 20 samples often suffice, whereas more heavily skewed distributions ($|\text{skewness}| \geq 2.5$) may necessitate sample sizes beyond 100. These findings call into question the blanket use of the " $n \geq 30$ " heuristic and suggest more tailored guidelines are necessary for accurate inference. A graphical overview summarizes these results across the examined distributional families, offering clear guidance for applied researchers working with non-normal data.

18 - Chhatra Bastola, "Using Visible Light to Enhance Electrochemical CO₂ Reduction on Organic Molecule-Modified Copper Nanostructures"

Electrochemical carbon dioxide reduction (CO₂RR) on copper surfaces offers a promising strategy to convert greenhouse gases into valuable fuels using renewable electricity. Copper is a plasmonic metal that supports localized surface plasmons—collective oscillations of free electrons generated when the metal is illuminated with light. The energy released from plasmon excitation can create localized electromagnetic fields and energetic charge carriers at the metal surface, potentially enhancing reaction activity and selectivity. In this work, we investigate plasmon-enhanced CO₂ reduction on nanostructured copper functionalized with 4-bromothiophenol (4-BTP). Under applied electrochemical bias and light illumination, the 4-BTP layer undergoes C–Br bond cleavage, generating reactive aryl radical species at the metal surface. We hypothesize that these transient radicals interact with CO₂ reduction intermediates and modify interfacial reaction pathways. Additionally, radical–copper interactions may alter the local electronic structure and influence the plasmonic response during catalysis. We employ in situ surface-enhanced Raman spectroscopy (SERS) to directly monitor molecular transformations at the electrode surface, providing molecular-level insight into how plasmon excitation couples with surface chemistry to control electrochemical carbon conversion. By elucidating how light-driven plasmon excitation can be coupled with reactive molecular surface chemistry, this research advances fundamental understanding of energy conversion at solid–liquid interfaces. Insights from this work may guide the rational design of light-assisted electrocatalysts that operate more efficiently and selectively under renewable energy input. In the long term, strategies that improve CO₂ utilization could contribute to sustainable fuel production, carbon recycling technologies, and broader efforts toward reducing greenhouse gas emissions and developing carbon-neutral energy systems.

19 - Yishu Dong, "METTL3-Driven m6A Epitranscriptomic Reprogramming Mediates Ambient Particulate Matter-Induced Metabolic Dysregulation and Cytokine Amplification"

Background: Ambient fine particulate matter (PM_{2.5}) is strongly associated with cardiopulmonary morbidity, but the upstream molecular events linking exposure to metabolic reprogramming and cytokine amplification in lung epithelium remain incompletely defined. N⁶-methyladenosine (m⁶A), a reversible RNA modification, regulates transcript stability and translation during stress responses; however, its role in PM induced pulmonary inflammation is unclear. Objectives: To determine whether PM induces an m⁶A dependent epitranscriptomic program that drives HIF-1 α mediated glycolytic reprogramming and inflammatory cytokine production, and to evaluate METTL3 as an upstream therapeutic target in vitro and in vivo. Methods: Lung epithelial models were exposed to PM, followed by assessment of global m⁶A abundance, METTL3 expression, and stability of HIF-1 α transcripts, including evaluation of IGF2BP2-dependent transcript stabilization. Glycolytic activation and inflammatory cytokine output were measured after PM exposure, with pathway validation using HIF-1 α inhibition and glycolysis blockade. METTL3 self-methylation and feed-forward regulation were examined to test autoregulatory amplification. In vivo, PM exposed lungs were analyzed for epithelial METTL3 and HIF-1 α expression, inflammatory markers, and histopathology, with parallel testing of pharmacologic METTL3 inhibition. Results: PM increased global m⁶A levels and upregulated METTL3 in lung epithelial cells. PM also enhanced m⁶A deposition on HIF-1 α transcripts and promoted IGF2BP2 mediated transcript stabilization, resulting in sustained HIF-1 α accumulation. This was accompanied by glycolytic reprogramming and robust cytokine induction. PM additionally triggered METTL3 self-methylation, reinforcing METTL3 expression and amplifying downstream signaling, consistent with a self-reinforcing circuit. Functionally, inhibition of HIF-1 α or glycolysis significantly reduced PM-induced cytokine production, indicating that metabolic rewiring is required for full inflammatory amplification. In vivo, PM increased epithelial METTL3 and HIF-1 α , elevated pulmonary inflammatory mediators, and worsened lung injury, whereas METTL3 inhibition attenuated these outcomes. Conclusions: PM activates a METTL3-centered epitranscriptomic feed-forward axis in which m⁶A modification stabilizes HIF-1 α via IGF2BP2, coupling RNA methylation to glycolytic activation and cytokine escalation. These findings identify METTL3 as an upstream, actionable regulator of PM induced pulmonary inflammation and support METTL3 targeted intervention as a potential strategy to mitigate PM related lung and cardiopulmonary complications.

20 - Anthony Duarte, "Global Trends of Tropical Cyclone Intensity Change"

The Rapid intensification (RI) of tropical cyclones (TCs) has become a concerning trend in recent years and has made hurricane forecasting increasingly difficult as a result. Several studies have been conducted by Klotzbach et al. (2022), Bhatia et al. (2022), Manikanta et. al (2023) in recent years suggesting an overall increasing trend in rapidly intensifying TCs across different ocean basins. Studies also found an increasing rate of intensification from category 1 (CAT1) to major hurricanes (Kishtawal et al. 2012; Wang et al. 2020) during the past 35 years. Wang et al. (2020) also found that the probabilities of RI and rapid weakening (RW) have both risen in the period 2000-2018 compared to 1982-1999. However, both Klotzbach et al. (2022) and Bhatia et. al (2022) did not include tropical depressions (TDs), therefore missing many RI cases that initially began in the TD stage. Their studies had less samples. Similarly, both Kishtawal et al. (2012) and Wang et al. (2020) only studied CAT1-5 hurricanes with life-time maximum intensity of at least CAT2 or CAT3, excluding TDs and tropical storms (TSs). Therefore, in this study, we plan to analyze 40 years of TC best track data (1982-2022) to determine the long-term trends of TC intensity change. We'll include TCs from all initial intensity stages (e.g., TD, TS, and all hurricanes from CAT1 to CAT5) and all global TC-prone basins. We'll classify TC intensity change into different categories including RI, slowly intensifying (SI), neutral (N), slowly weakening (SW), and RW. We'll compare the trends of TC intensity changes for 6 TC-prone basins: Atlantic (ATL), East Pacific (EPA), Northwest Pacific (NWP), South Pacific (SPA), North Indian (NIO), South Indian (SIO). We determined that 6 of the 7 intensity changes across all global basins recorded significant results with increasing values being observed in the highest intensity-change metrics including RI30, RI50, RW30, and RW50. The conclusions drawn from this study on the RI of tropical cyclones will drastically improve hurricane modeling and forecasting, giving meteorologists a better understanding on the exact factors that cause the phenomenon and how to accurately foresee it with an adequate lead time.

21 - Sylvia Etim, “Novel Forensic Quantification Kit for Human and Bacterial DNA using Nanoplate Digital Polymerase Chain Reaction (dPCR)”

Next-generation sequencing (NGS) enables high-throughput forensic DNA analysis of STRs, SNPs, and mtDNA, but excessive bacterial contamination can compromise data quality through spurious reads and misalignment. Current forensic DNA quantification kits assess human DNA quantity, degradation, and inhibition, yet do not quantify bacterial DNA.

This study addresses this limitation by incorporating a generic bacterial target into a digital PCR (dPCR)-based multiplex quantification assay. Digital PCR partitions samples into nanowells, enabling absolute DNA quantification with improved sensitivity, specificity, and resistance to PCR inhibition compared to real-time PCR. The platform allows simultaneous detection of up to 12 dye-labeled targets, including autosomal, Y, mtDNA, and bacterial markers.

A commercially available forensic quantification kit (Qiagen Investigator Quantiplex Pro) was modified and validated using spiked and simulated forensic samples collected from smooth and rough surfaces. The assay demonstrated high sensitivity, detecting bacterial DNA at levels as low as 10 fg/μL. This system provides an effective tool for identifying bacterial contamination and triaging samples prior to NGS or electrophoresis-based analysis, particularly for low-level and degraded samples.

22 - Daigoro Greco, "Chronological Evolution of Volatile Organic Compounds (VOCs) from Burned Human Remains Analogues"

Combustion and pyrolysis of human remains involve a complex cascade of physical transformations and chemical reactions that remain scarcely investigated in forensic science. Existing forensic fire literature largely prioritizes scene reconstruction, accelerant detection, and structural analysis, while studies involving human remains tend to focus on end-stage combustion effects or contaminant identification. As a result, the chemical evolution of human odor during burning is not well understood, limiting interpretation of post-fire scenes and potentially contributing to operational challenges reported during human remains detection (HRD) canine deployments. Consequently, this study sought to characterize the chronological evolution of volatile organic compounds (VOCs) emitted from human remains analogs subjected to progressive thermal degradation and to compare these profiles to those associated with decomposition. Fresh porcine tissue, a widely accepted human surrogate, was excised, divided into triplicate samples, and incinerated in an electric laboratory furnace under tightly controlled conditions using a 10 °C/min thermal ramp. Timed extractions corresponded to thermal exposure points ranging from 30 °C to 450 °C, capturing multiple stages of combustion. Following removal from heat, samples were sealed and headspace VOCs were collected using 50/30 µm DVB/CAR/PDMS SPME fibers and analyzed by GC-MS with a volatiles-dedicated column. Progressive burning produced VOC profiles that were chemically distinct from those observed during decomposition. Burned analogs exhibited substantially reduced total headspace abundance and a marked, temperature-dependent decline in compound diversity (from a maximum of 92 detected compounds to as few as 6), compared to an average of 201 compounds detected in decomposing analogs. Functional group dominance shifted dynamically across thermal exposure points, with alternating contributions from aromatics, aldehydes, and organo amines. In contrast, decomposition-associated headspace was consistently dominated by organo sulfurs, aromatics, and alcohols. These findings demonstrate that combustion fundamentally alters the volatile signature of human remains, producing odor profiles that diverge significantly from those typically associated with decomposition. The observed chemical divergence provides a mechanistic basis for reported HRD canine detection difficulties in post-fire environments, though canine performance was not directly evaluated. This work supports the need for controlled canine validation studies and expanded fire-scene realism in training and operational contexts.

23 - Ashleigh Hartwig, "Closing the Rings in Titan's Atmosphere through Nitrile Chemistry: A Computational Study"

Titan, Saturn's largest moon, is the only planetary body besides Earth known to have stable quantities of liquid on its surface. Unlike Earth, Titan's lakes consist of methane, because its icy surface temperatures lie near methane's triple point. This allows methane to exist both as a surface liquid and an atmospheric gas, driving a methane-based hydrological cycle similar to Earth's water cycle. Titan's dense nitrogen-methane atmosphere supports complex organic chemistry, producing a wide range of species and radicals. These compounds are thought to play an important role in Titan's atmospheric evolution and have been proposed as potential precursors to prebiotic chemistry. Computational studies of these gas-phase reaction networks provide a valuable alternative for quantifying reaction kinetics and assessing Titan's atmosphere as a chemically complex dynamic system.

In this work, we explore gas-phase pathways leading to nitrogen-containing heterocycles relevant to Titan's atmospheric chemistry. Using electronic structure calculations at the CCSD(T)-F12/cc-pvtz-f12// ω B97XD/6-311G(d,p) level of theory, we identify a ring-closing mechanism that forms pyrrole through the reaction of singlet methylene ($^1\text{CH}_2$) with acrylonitrile ($\text{C}_2\text{H}_3\text{CN}$). Relative energies of reactants, intermediates, transition states, and products were determined to identify the most favorable reaction pathways.

Pyrrole and related heterocycles are of interest due to their thermodynamic stability and potential role as building blocks for complex prebiotic molecules, acting as stable nitrogen reservoirs and precursors to larger polycyclic and aerosol-forming compounds in planetary atmospheres. Although pyrrole has not yet been detected in Titan's atmosphere, identifying possible formation pathways provides critical insight into how nitrogen heterocycles could arise and persist under Titan-like conditions. Our results provide a foundation for investigating the formation of additional nitrogen-containing heterocycles that may contribute to the emergence of prebiotic molecular complexity in Titan's atmosphere and other pyrrole-rich planetary environments or in the interstellar medium.

24 - Md Hossain, "Expanding Nanopore Technology for Small-Molecule Detection through Tunable Polyacrylamide Hydrogels"

Nanopore sensing is highly effective for nucleic acid detection; however, reliable single-molecule detection of small molecules (~1 nm) remains a significant challenge due to their rapid translocation, weak signal amplitude, and poor signal-to-noise ratio (SNR). Existing external crowding agents, such as fibrin hydrogels and polyethylene glycol (PEG), improve detection; however, they are limited by long-time stability, limited tunability, solidification issues, and tip clogging. To overcome these limitations, we systematically investigated polyacrylamide hydrogel as a stable, tunable, and reusable external crowding platform for enhancing small-molecule detection in nanopore systems. We first evaluated gel percentages ranging from 0.25% to 3.0% (29:1 ratio) using insulin (~2–3 nm) as a model analyte to assess crowding efficiency. Event rate and SNR were used as primary optimization parameters. A 2.0% gel (29:1) produced approximately a 500-fold increase in event rate relative to 0.25%, with improved current amplitude (~50 pA) and strong SNR. Higher percentages ($\geq 2.5\%$) reduced performance and caused baseline instability. After identifying the optimal percentage, we tuned crosslinking ratios (5:1 to 37.5:1) to detect smaller molecules. For cucurbit[7]uril (CB7), a 2% gel at 19:1 provided the best balance between event rate and SNR. Detection of even smaller molecules such as ATP and AMP required further adjustment: increasing gel concentration to 2.1% and reducing the ratio to 5:1 enabled reliable ATP detection with both resistive and conductive events. We further examined bias dependence, nanopipette taper geometry, and analyte concentration. long-taper nanopipettes enhanced molecular accumulation, translocation control, and enhanced detection. Importantly, no single hydrogel condition was universally optimal; instead, molecule-specific tuning of gel percentage and ratio was essential. This work establishes a systematic optimization framework for polyacrylamide hydrogels in nanopore sensing and significantly expands nanopore technology's capability to detect neutral, positively charged, and negatively charged small molecules, including ATP and doxorubicin.

25 - Zain Hussein, "High-pressure structural and electronic analysis of cubic NdAlO₃"

The rare-earth (RE) aluminate perovskites have been extensively studied under ambient and high-temperature conditions because the choice of lanthanide strongly influences their exhibited properties, including half-metallic ferromagnetism and tunable electrical conductivity. Across the lanthanide series, the lanthanide contraction modifies ionic radii, affecting their associated crystal symmetry at ambient conditions and the phase transitions they undergo in nonequilibrium conditions. This results in different phase transitions between the less symmetric systems towards the ideal cubic symmetry. Pressure and temperature provide an effective route to induce these structural transformations. While elevated temperature alone has commonly been used to stabilize higher-symmetry phases, many RE aluminates require temperatures or pressures that are prohibitively high when applied independently. By combining pressure and temperature, the transition toward cubic symmetry can be significantly accelerated under more accessible means. In this work, we discuss the high-pressure high-temperature synthesis of single-crystal cubic NdAlO₃ using a laser-heated diamond anvil cell, which offers a controlled platform for reaching extreme conditions. We report X-ray diffraction measurements on cubic NdAlO₃ up to 113(4) GPa, providing insight into its structural stability and compressional behavior. To complement the experimental results, we performed first-principles calculations at both ambient and high pressure to predict the structural and electronic properties of both the rhombohedral and cubic phases. These calculations help compare the stability of both phases and their evolution in electronic structure under compression. This combined experimental-computational approach establishes a comprehensive understanding of the phase stability and electronic behavior in NdAlO₃ under extreme conditions, highlighting the effectiveness of coupling high-pressure high-temperature methods for synthesis routes in stabilizing cubic RE aluminate perovskites.

26 - Galpayage Dona Thouli Jayawardana, “Enhancing IMS-based, non-contact fentanyl detection using a novel vapor pre-concentrator”

Fentanyl’s low vapor pressure poses a major challenge to its detection via vapor sampling, particularly when present in trace quantities or mixtures, conditions common in seized street samples. While recent developments by Fulton et al. on a handheld Ion Mobility Spectrometer (IMS) device, optimized to detect fentanyl’s vapor surrogate, NPPA, have offered promising presumptive identification capabilities, their performance has been limited by insufficient headspace NPPA in seized samples. To address this limitation, the present study focuses on developing a novel vapor pre-concentrator based on a Silicon Nanowire (SiNW) array coated with an acrylate-based polymer that selectively adsorbs NPPA. This approach builds on foundational research by Fulton et al., who developed a handheld IMS method for non-contact fentanyl detection, and by Giordano et al., who demonstrated the effectiveness of SiNW as a vapor pre-concentration substrate. Additionally, prior work at the Naval Research Laboratory identified a library of acrylate polymers with strong pre-concentration potential. Leveraging these findings, the current study began by screening five selected acrylate polymers using Quartz Crystal Microbalance (QCM) analysis to evaluate their adsorption affinity toward NPPA. Ethylene glycol methyl ether acrylate (EGMEA) exhibited the highest NPPA affinity and was selected for further validation. To assess EGMEA’s field utility and confirm NPPA as a reliable vapor surrogate, a low-cost passive sampling method using EGMEA-coated filter papers was developed. Initially, these filter papers were exposed to the headspace of 100 mg of reference-grade fentanyl, and analysis via Thermal Desorption-Gas Chromatography/Mass Spectrometry (TD-GC/MS) confirmed the presence of NPPA. Following this, EGMEA-coated filters were deployed at several crime laboratories to sample seized fentanyl. NPPA was again detected, demonstrating the polymer’s selective adsorption ability and supporting NPPA’s suitability as a fentanyl vapor surrogate. This study highlights a promising pre-concentration strategy to enhance vapor-phase detection of fentanyl, improving sensitivity for field-portable IMS devices.

27 - Kristen Jerich, "Analysis of Fentanyl Analogs in multi-component drug mixtures using Surface Enhanced Raman Spectroscopy"

The opioid crisis in the United States has led to a substantial increase in drug-related fatalities, with approximately 80,000 overdose deaths reported in 2024 and nearly 60% attributed to synthetic opioids such as fentanyl and its analogs. The extreme potency of fentanyl makes it lethal at trace levels, emphasizing the need for rapid, sensitive detection methods capable of analyzing complex mixtures in field settings. Fentanyl analogs—structurally modified derivatives of the 4-anilidopiperidine core—pose additional analytical challenges due to their structural diversity and similar pharmacological effects.

This study employed surface-enhanced Raman spectroscopy (SERS) with handheld Raman spectrometers to detect and differentiate fentanyl and related compounds, enabling practical in-field screening. While prior research has applied SERS to street drug analysis, confirmatory identification has typically required mass spectrometry or chromatographic techniques, and most studies have focused on binary mixtures using paper- or nanosphere-based substrates. Complex mixtures containing three or more components were analyzed using synthesized colloidal gold and silver nanostars, which produced signal enhancements up to seven orders of magnitude and detection limits as low as 1 ng/mL. Aggregating salts promoted analyte–nanoparticle clustering and increased Raman enhancement through localized surface plasmon resonance.

Density Functional Theory (DFT) calculations were integrated to predict vibrational modes, support spectral interpretation, and improve specificity among structurally similar analogs. A computationally supported spectral library of fentanyl, multiple analogs, adulterants, and other scheduled substances was developed to enable algorithm-based detection, differentiation, and quantification in multi-component mixtures.

Results confirmed that SERS enhanced with Au/Ag nanostars allows rapid and accurate detection of fentanyl analogs in complex drug samples, demonstrating strong potential as a screening tool for forensic, clinical, and field-based drug analysis.

28 - Nasrin Khatun, “Evaluation of Dimension Reduction Techniques in Functional Data Analysis”

This thesis evaluates four functional dimension reduction techniques—Functional Principal Component Analysis (FPCA), Functional Factor Analysis (FFA), Functional Discriminant Analysis (FDA), and Functional Canonical Correlation Analysis (FCC)—applied to smoothed functional representations of five distinct time series datasets exhibiting various seasonal and trend characteristics. Each time series is transformed into functional data via basis function expansions and smoothing, facilitating a comprehensive comparison of these dimension reduction methods. The evaluation is conducted across four experimental scenarios: (i) using original smoothed functional data, (ii) optimizing smoothing parameters and basis selection for each technique, (iii) applying the methods to Monte Carlo simulated datasets generated from the original data with 100 and 200 iterations, and (iv) applying real life data. Forecasting accuracy is assessed using Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), and Mean Absolute Percentage Error (MAPE). Key findings reveal that FPCA consistently excels in reducing dimensionality and improving forecast accuracy for seasonally influenced data with trends, both before and after smoothing optimization. FCC demonstrates superior performance post-simulation for multiplicative and additive seasonal data without trend, confirming its robustness. For trend-only data lacking seasonality, FFA and FDA outperform other methods. These results underscore the importance of selecting dimension reduction techniques tailored to the functional data structure to enhance forecasting performance. The results from real data also show that for additive seasonality with trend data, before simulation, except for FCC, the other three methods perform best; whereas with simulation, all methods perform well, which matches the previous study. This study provides valuable insights for functional data application domains, including climate science, finance, and transportation, highlighting FPCA and FCC as versatile methods for seasonal data and FFA/FDA as specialized tools for trend-dominated datasets. Keywords: Functional Data Analysis, Dimension Reduction, Functional Principal Component Analysis, Functional Factor Analysis, Functional Discriminant Analysis, Functional Canonical Correlation, Time Series Forecasting, Generalized Cross Validation (GCV) Optimization, Monte Carlo Simulation.

29 - Moses Kiwanuka, “Improving Chlorophyll-a Prediction and HAB Monitoring in Lake Okeechobee Through Zonal Machine Learning Modeling”

Chlorophyll-a is a primary indicator of phytoplankton biomass and eutrophication in inland lakes and is essential for monitoring ecosystem health and harmful algal bloom (HAB) risk. Predicting chlorophyll-a dynamics in large, shallow lake systems such as Lake Okeechobee remains challenging due to complex nonlinear interactions among hydrological, meteorological, and nutrient drivers. This study developed machine-learning models to predict its concentrations using long-term in-situ water-quality and environmental data collected from 2013 to 2024. Both lake-wide and zone-specific (littoral, transitional, and pelagic) modeling frameworks were implemented to capture spatial variability and improve predictive performance. Among the evaluated algorithms, gradient-boosting methods, particularly XGBoost and CatBoost demonstrated the highest predictive accuracy. At the lake scale, models achieved strong performance, with test coefficients of determination (R^2) ranging from 0.80 to 0.88; XGBoost provided the best overall results ($R^2 \approx 0.88$). Zonal modeling revealed pronounced spatial heterogeneity, with the transitional zone exhibiting the highest predictability ($R^2 \approx 0.95$), followed by the pelagic zone ($R^2 \approx 0.69-0.77$), while the littoral zone showed lower accuracy due to nearshore complexity and wind-driven sediment resuspension. Explainable AI analysis identified temperature–nutrient interactions, nitrate–nitrite, turbidity, and total phosphorus as dominant predictors influencing its variability. These findings demonstrate the potential of machine learning combined with spatial stratification to improve HAB monitoring and lake management. Key words: Chlorophyll-a, Machine learning, Lake Okeechobee, Zonal modeling, Nutrients

30 - Maria Lucia Masferrer Bertoli, "Host Isomerism, Solvent, and Counterion Effects on Selective Ammonium Sensing, Binding, and Extraction"

(1) Sensing and quantifying NH_4^+ is important in clinical, environmental, and forensic disciplines, yet its selective recognition remains challenging due to strong interference from alkali metal cations, particularly K^+ . Synthetic alternatives capable of improved selectivity toward ammonium are needed. (2) Herein, we investigate the effect of host isomerism on the sensing, binding, and extraction behavior of three isomers of a recently reported fluorescent indazole-based ligand based on a 1,3,5-triethylbenzene scaffold (L9a-c) toward NH_4^+ and competing cations (Na^+ and K^+). (3) We first evaluated the influence of isomerism on the photophysical properties (i.e., molar absorptivity and quantum yield) of the ligands and their sensing abilities toward these analytes. We also studied the binding affinities of L9a-c toward these analytes via UV-visible titrations in CH_3OH and 1:1 $\text{CH}_3\text{CN}:\text{DCM}$ (using NO_3^- and PF_6^- salts). Finally, we compared the binding vs. extracting ability of L9b. (4) Among the three ligands, the isomer bearing two 1H-indazole arms (L9b) exhibited the strongest binding affinity for NH_4NO_3 in CH_3OH ($\log K_{11}$ 4.3), outperforming L9a and L9c. This enhanced selectivity is attributed to reduced steric hindrance and a more favorable binding organization in solution. L9b also maintained its NH_4^+ affinity in a competitive cation matrix. However, despite this favorable binding, liquid-liquid extraction experiments revealed preferential extraction of K^+ and Na^+ over NH_4^+ (90, 95 vs 55%, respectively). Additionally, counterion effect is large in the binding of all three analytes. Counterion effects were found to be significant across all ligands, with PF_6^- reducing the binding affinities of Na^+ and K^+ —which interact primarily through cation- π interactions—by approximately one order of magnitude. (5) These results highlight the difference between binding and extraction selectivity, as the latter may depend more on the strengths of the interactions between the host and the guest, while the other may depend more on cavity fit. (6) Our study underscores the importance of considering host isomerism, solvent, and counterion effects, some factors which are often overlooked when designing and studying selective synthetic NH_4^+ sensors and extractants.

31 - HM Nayem, "Ridge Prediction with Feature Screening in High-Dimensional Health Data"

High-dimensional regression models frequently arise in health and biomedical research, where the number of predictors may be large relative to the sample size and substantial multicollinearity is common. In such settings, classical estimation procedures become unstable and prediction accuracy deteriorates. This paper investigates ridge-type regularization methods with particular emphasis on penalty parameter selection aimed at eigenvalue stabilization and bias–variance trade-off optimization. To enhance estimation stability while preserving the high-dimensional structure, we incorporate a modified marginal correlation–based screening procedure as a preliminary feature reduction step. Theoretical properties of the proposed framework are established under high-dimensional asymptotic. A comprehensive Monte Carlo simulation study evaluates the predictive and estimation performance of ridge-type estimators in comparison with Lasso, Elastic Net, Adaptive Lasso, and SCAD methods across varying degrees of multicollinearity and sparsity. Results demonstrate that appropriately tuned ridge-type estimators exhibit superior robustness under severe predictor correlation, particularly in moderately dense signal settings. The methodology is illustrated using the riboflavin production dataset, highlighting practical implications for high-dimensional biomedical applications. The proposed framework provides a stable and computationally efficient strategy for prediction in health-related high-dimensional data settings.

32 - Rigoberto Olivera, “Physical Drivers of Declining Precipitation in Florida's Dry Season”

Dry season precipitation over Florida has declined significantly from 1979–2021, most notably in March, with a pronounced regime shift around 1998 evident in both station observations and gridded reanalysis datasets. Because dry-season rainfall is already limited, continued reductions exacerbate regional water-resource stress. This study investigates the drivers of the observed declining March precipitation in Florida since 1979. Using reanalysis products, trend analytics, and vertically integrated moisture budget analysis, we assess changes in precipitation frequency, extratropical cyclone activity, and large-scale vertical motion. Results show that while March extratropical cyclone frequency affecting Florida has remained relatively stable, storm-associated rainfall has declined, indicating reduced precipitation efficiency. Analysis of the ERA5 reanalysis dataset reveals an increase in mid-tropospheric subsidence (ω_{500}) over Florida from 1979–2021, consistent with weakened synoptic ascent and frontal lifting. Despite increasing evaporation and a stable amount of moisture, vertically integrated moisture flux diagnostics show no corresponding enhancement in convergence. This indicates that precipitation is being reduced by dynamically suppressed ascent rather than by moisture scarcity in the region. Improved understanding of the mechanisms controlling dry-season precipitation variability is critical for seasonal water-resource planning and anticipating hydroclimate risk in a warming climate.

33 - Sadie Olrogg, “Headspace Analysis of Reference-Grade and Seized Xylazine, 4-ANPP, and Nitazenes”

Canine odor detection is widely used in law enforcement to locate illicit drugs at ports of entry and in other operational settings. Detection dogs alert to volatile organic compounds (VOCs) associated with the substances on which they are trained. To better understand this olfactory process and enhance canine detection capabilities, VOCs from both reference-grade and seized drug samples must be characterized through headspace analysis. Solid phase microextraction coupled with gas chromatography–mass spectrometry (SPME-GC-MS) is the primary method for VOC collection and analysis in both laboratory and field applications. This study employed a previously optimized SPME-GC-MS method for fentanyl headspace analysis, consisting of a 24-hour equilibration period followed by a 24-hour heated extraction at 35°C and subsequent thermal desorption into the GC-MS system. Recent forensic trend reports have documented increasing prevalence of xylazine, 4-anilino-N-phenethylpiperidine (4-ANPP), and benzimidazole opioids (nitazenes) in seized drug samples. Xylazine, a non-opioid sedative, is frequently encountered as an adulterant in cocaine, heroin, and fentanyl, and has been detected in a significant proportion of fentanyl-related overdoses. 4-ANPP is a pharmacologically inactive fentanyl precursor commonly identified due to synthetic residues or degradation of fentanyl analogs. Nitazenes comprise a class of highly potent benzimidazole opioids, with some analogs exceeding fentanyl in potency. This research identified vapor surrogates, including toluene, associated with xylazine, 4-ANPP, and several nitazene analogs in reference materials. Analysis of seized nitazenes revealed synthesis materials and byproducts such as quinolone, dimethyl sulfone, acetic acid, and N,N-dimethylformamide. Although no single VOC was consistently present across all nitazenes, overlapping byproducts provided insight into potential synthesis pathways and represent promising target compounds for canine detection training.

34 - Patrick Ben Emoi Otema, "Evaluating Legume-Cereal Cover Crop Intercropping with Biochar in High Tunnel and Open Space Systems"

High-tunnel systems enable season extension and crop protection from adverse climatic conditions, but face soil fertility decline from intensive production. Subtropical open-field systems suffer nutrient leaching losses during unpredictable heavy rains. Legume-cereal intercropping with biochar could enhance fertility retention in tunnels and reduce open-field losses, though cereal partner effects remain untested. This pot experiment compared Soybeans-Glycine max (L.) Merr. intercropped with Pennisetum glaucum (pearl millet) or Sorghum bicolor (L.) Moench plus biochar (1, 3 t ac⁻¹) under high tunnel vs open conditions (n=4 reps). Nine treatments included sole crops (T1-3), unamended intercrops (T4-5), and biochar-amended intercrops (T6-9). Plant height, SPAD chlorophyll, volumetric water content (VWC), EC, and temperature were measured. Cereal heights ranged 41-142 cm, generally taller under high tunnel (70-142 cm) vs open (41-133 cm) conditions. Soybean heights spanned 33-87 cm across systems. SPAD values ranged 11-76 (mean 20-40), with high tunnel treatments averaging 5-10 units higher than open space. Biochar treatments (T6-9) maintained 6-48% VWC vs 4-37% unamended controls, though variability was high. EC values peaked at 0.44 mS/cm in high-rate biochar intercrops. High tunnel temperatures averaged 27-39°C vs 22-36°C open. High tunnels consistently improved plant growth in intercrops across cereal partners (pearl millet vs sorghum), while biochar amendments enhanced soil moisture retention despite high variability. These controlled findings identify optimal intercrop combinations for scaling to high tunnel systems, warranting field validation. Keywords: legume-cereal intercropping, biochar amendments, high tunnel production, cover crop systems, organic farming.

35 - Bipin Paudel, "Nickel Sulfide Nanowire-filled Carbon Nanotubes as Electrodes for High-Performance Supercapacitors"

'As the demand for efficient and sustainable energy storage grows, developing electrode materials with high capacitance, fast charge transport, and long-term stability is essential. Nickel sulfide (Ni₃S₂) is a promising pseudocapacitive material due to its high theoretical charge storage capacity and rich redox chemistry. However, its practical performance is limited by poor electrical conductivity and incomplete utilization of electroactive sites. Integrating Ni₃S₂ with conductive carbon nanotubes (CNTs) offers an effective strategy to overcome these limitations. The objective of this study is to design a binder-free Ni₃S₂@CNT composite electrode and investigate how the conductive CNT network enhances charge storage performance. Ni₃S₂ and CNTs were directly grown on carbon cloth via a one-step chemical vapor deposition (CVD) process, forming a three-dimensional, interconnected, conductive framework. In this structure, CNTs provide efficient electron-transport pathways, structural support, and additional charge storage through electric double-layer capacitance, while Ni₃S₂ enables charge storage via reversible Faradaic reactions. Controlled nitric acid treatment was applied to further improve surface accessibility and activate electrochemical sites. Electrochemical measurements show that the optimized electrode delivers a specific capacitance of approximately 1200 F g⁻¹ at 1 A g⁻¹ and retains about 90% of its capacitance after 2300 cycles, demonstrating excellent performance and stability. This work presents a scalable approach for designing high-performance supercapacitor electrodes and contributes to the development of advanced energy storage systems for renewable energy, portable electronics, and high-power applications

38 - Anurag Sharma, "Spatial and Temporal Variability in Uplift Across Greenland: Linking Geodetic Observations to Atmospheric Warming and Ocean Forcing"

The Greenland Ice Sheet is losing mass at an accelerating rate, contributing substantially to global sea-level rise. Understanding the spatial distribution and temporal evolution of this ice loss is critical for determining Greenland's contribution to future sea-level rise. Vertical land motion (VLM) derived from Global Navigation Satellite System (GNSS) observations provides a direct measure of elastic rebound associated with ice mass unloading, offering insights into where and when ice loss is occurring. This study investigates spatial and temporal patterns of VLM across Greenland using GNSS time series from stations located along the ice sheet margin. We analyzed how variations in uplift rates are correlated with atmospheric temperature anomalies and oceanic forcing.

Our results reveal clear spatial gradients in uplift rates and identify periods of enhanced uplift corresponding to anomalous atmospheric and oceanic warming. These findings demonstrate how GNSS networks can constrain the spatial distribution and climate drivers of Greenland ice mass loss, advancing our understanding of ice sheet response to regional climate forcing.

39 - Brandon Sosa, “Quarry-based Mariculture of the Caribbean king crab in Support of Reef Restoration”

Scaling up herbivore populations is a critical component of Florida’s coral reef restoration strategy. As part of the Mission: Iconic Reefs initiative, the Florida Keys National Marine Sanctuary plans to stock hundreds of thousands of grazers—primarily the long-spined sea urchin (*Diadema antillarum*) and the Caribbean King Crab (*Maguimithrax spinosissimus*)—to suppress macroalgal overgrowth and promote coral recovery. However, current production of these grazers relies heavily on resource-intensive land-based larviculture systems, which face bottlenecks in terms of cost, labor, space, and scalability.

This study explores quarry-based mariculture as a complementary grow-out strategy to support existing land-based hatchery operations. We tested the feasibility of using abandoned saltwater quarries in the Florida Keys to rear *M. spinosissimus* juveniles in semi-natural conditions. Across three experimental trials, we compared survival and growth between laboratory and quarry environments, evaluated performance across quarry sites and maternal clutches, and assessed the effects of stocking density. Environmental monitoring and algal community assessments were conducted to track seasonal variation in grow-out conditions.

While survival was low across all trials, early evidence suggests that quarry systems can support comparable juvenile growth and survival to traditional lab systems. Growth varied significantly by site and clutch, highlighting the importance of environmental conditions, while high stocking densities negatively impacted crab performance. Seasonal algal abundance and stable water conditions suggest quarries could provide a suitable, food-rich environment for cost-effective grow-out.

Quarry-based mariculture offers a scalable, distributed grow-out solution that can help relieve pressure on land-based systems. By bridging the gap between larval rearing and reef deployment, this approach enhances restoration capacity and supports broader ecological recovery goals for Florida’s Coral Reef.

40 - Sarah Tillem, "Developing Soil Management Zones Based on Soil Nutrient Distribution for Crop and Fertilizer Management in Texas Cropping Systems."

Uniform soil management practices often assume that nutrient levels are evenly distributed across agricultural fields. However, soil properties are inherently variable due to differences in parent material, topography, historical land use, and management practices. Applying fertilizers uniformly across spatially heterogeneous fields can lead to overapplication in some areas and nutrient deficiencies in others. This not only reduces input efficiency and increases production costs but may also contribute to nutrient runoff and soil degradation.

This study focuses on developing soil management zones based on spatial patterns of primary and secondary macronutrients in selected Texas cropping systems. Texas agricultural landscapes are diverse in soil type and management intensity, making them well-suited for evaluating within-field variability. Soil samples were collected from multiple field locations and analyzed using X-ray fluorescence (XRF) to determine total elemental nutrient concentrations. Primary and secondary macronutrients were extracted and spatially interpolated to generate continuous nutrient distribution surfaces.

Interpolated nutrient maps were used to evaluate field-scale distribution trends and identify areas with similar nutrient characteristics. Preliminary analyses reveal consistent spatial patterns, suggesting that portions of fields may respond differently to fertilizer applications. These findings provide a foundation for future development of management zones to support targeted crop and fertilizer management strategies. By identifying field-scale nutrient differences, this research supports precision agriculture efforts to improve effectiveness and resource management.

41 - Jose Manuel Torres Parada, “Episodic terrigenous fluxes and redox variability during the Cenomanian-Turonian oceanic anoxic event (OAE2): Geochemical evidence from the Salada Formation, Colombia”

Understanding terrigenous input and redox conditions during Oceanic Anoxic Events (OAEs) is crucial for reconstructing the factors that controlled organic matter preservation as well as biogeochemical changes in marine systems. Previous geochemical studies in the Late Cretaceous “La Luna Sea” (Northern South America) provided valuable information about the depositional environment, but the intensity of terrigenous influxes and paleoredox conditions within this basin, especially during the Cenomanian–Turonian interval, remain underexplored. This study aims to determine the relationship between terrigenous supply and reducing conditions during the Cenomanian –Turonian transition in a 54-m-thick section of the Salada Formation (Middle Magdalena Valley, Colombia) using major (Si, Al, Ti, K) and trace elements (V, Ni, Co, Cr, Cu, Zn, Mo, U, Tl, Th) geochemistry. Major elements Al (1.24–15.73 wt%), Si (1.93–54.64 wt%), Ti (0.01–0.49 wt%), and K (0.14–1.67 wt%) display moderate positive correlations with TOC ($R^2 = 0.49 - 0.56$). Si, K, and Ti strongly correlate with Al ($R^2 = 0.64-0.93$). Trace-elements from 16 samples such as V (5.69 – 1359.43 ppm), Ni (0–342.99 ppm), Co (0–12.49 ppm), Cr (12.63–135.28 ppm), Cu (0–46.70 ppm), Zn (0–1370.13 ppm), Mo (0.01–65.43 ppm), U (0.89–97.78 ppm), Tl (0–11.08 ppm), and Th (0–25.28 ppm) reveal enrichments at 6 m, 10.7 m, 16.1 m, and 19.7 m. V/Cr values range from 0.25–13.4 with maxima at 6 m, 8.45 m, 10.7 m, and 19.7 m, and minima at 4.4 and 7.4 m. The geochemical proxies indicate episodic enhanced terrigenous influxes coeval with reducing conditions associated with the OAE2, marked by an initial $\delta^{13}\text{C}_{\text{org}}$ positive excursion between 5.5 and 6.45 m. Our dataset shed light on the spatiotemporal variability of oxygen-deficient conditions during OAE2 in Northern South America.

42 - Daniel Tucker, "Rediscovering the Miami Palmetto: Using Citizen Science and Remote Sensing to Locate Wild *Sabal miamiensis* in Florida"

Problem Statement: *Sabal miamiensis* is a critically endangered palm endemic to the Pine Rockland and Pine Scrub habitats of southeastern Florida. Severe habitat loss and urbanization have pushed this species to the brink of extinction in the wild, making the identification of any surviving populations an urgent conservation priority. **Research Objectives:** This study presents a novel, multi-layered protocol combining open-source citizen science data, remotely sensed imagery, and LiDAR to systematically identify and map high-probability locations for extant populations. **Research Methodology:** Historical herbarium collections and range maps were used to define the species' historic distribution and guide site selection. Citizen science observations were then integrated with LiDAR-derived elevation data to detect characteristic Pine Rockland landscape signatures associated with known *S. miamiensis* occurrences. Ground-truthing expeditions were conducted at priority sites to verify predictions. **Results/Conclusions:** Ground-truthing expeditions at priority sites confirmed the presence of two wild populations on the fringes of the species' historic range. These findings demonstrate the power of combining low-cost, accessible technologies with targeted field verification for locating cryptic or presumed-extinct plant species. **Contribution/Significance:** This study establishes a replicable, cost-effective framework for rediscovering rare and cryptic plant species by layering publicly available datasets with remote sensing tools and directed fieldwork. The confirmation of two previously unknown wild populations provides critical baseline data for the conservation of *S. miamiensis*. **Broader Impacts:** The discovery opens new avenues for future conservation actions, including genetic characterization, ex-situ propagation, and reintroduction efforts aimed at restoring *S. miamiensis* and the broader Pine Rockland ecosystem it inhabits. The methodology developed here can be adapted for other imperiled species facing similar challenges of habitat fragmentation and limited survey resources.

43 - Nusrat Yasmin, “Stable and Robust Shrinkage Estimators for Multicollinear Regression: Applications to Health Data”

Multicollinearity undermines the reliability of ordinary least squares (OLS) estimation by inflating variances, producing unstable coefficients, and weakening statistical inference. These challenges are especially common in biomedical, epidemiological, and public health research, where multiple correlated risk factors are analyzed simultaneously. When explanatory variables are strongly interrelated, traditional regression methods may yield misleading conclusions, limiting their usefulness for evidence-based decision-making.

To address these issues, biased and penalized regression approaches such as ridge- and Liu-type estimators have been widely developed. These methods introduce shrinkage to stabilize coefficient estimation by reducing variance at the expense of a small bias, often leading to improved overall accuracy. However, many existing shrinkage estimators remain sensitive to data contamination and atypical observations, which are frequently encountered in real-world health datasets.

This study extends existing ridge-type methodologies by proposing improved ridge- and Liu-type shrinkage estimators, along with robust counterparts specifically designed to mitigate the influence of outliers. Theoretical properties of the proposed estimators are derived in terms of bias, variance, and mean squared error (MSE). Their empirical performance is assessed through extensive Monte Carlo simulations under varying sample sizes, correlation strengths, and contamination levels. To provide a comprehensive evaluation, multiple performance criteria—including MSE, Akaike Information Criterion (AIC), mean absolute deviation (MAD), mean absolute percentage error (MAPE), and an overall average-rank framework—are employed.

The broader impact of this work lies in enhancing the stability, interpretability, and predictive performance of regression models applied to complex health-related data. Applications to two real-world health datasets demonstrate that the proposed robust estimators consistently deliver more reliable parameter estimates and improved predictive accuracy, particularly in the presence of strong multicollinearity and outliers. By addressing two common practical challenges simultaneously, this research contributes to advancing methodological rigor and strengthening statistical tools used in applied health and biomedical research.

Social & Behavioral Sciences

44 - Ashley Adams, “Effects of Cannabis on Cognition: Moderating effects of disease severity among people living with HIV”

[Encore Presentation. Initially presented at INS Annual Meeting 02/06/2026]

Problem Statement. HIV-associated neurocognitive disorders (HAND) remain common among people living with HIV (PLWH) despite widespread ART access and achievable viral suppression. Cannabis use is also common in PLWH, often for symptom management, and cannabinoids may plausibly influence neurocognition via neuroimmune pathways. Higher cannabis exposure has been linked to poorer neurocognition in some samples, raising concern that heavy use could compound HIV-related vulnerability. Yet findings in PLWH are mixed, and it is unclear whether cannabis effects depend on HIV disease severity. This uncertainty limits actionable guidance for patients and providers regarding cannabis use and neurocognitive health.

Research Objective. This study tested whether HIV disease severity moderates associations between past-year cannabis use and neurocognition in ART-treated PLWH, and whether these associations are nonlinear.

Methodology. One hundred thirteen ART-treated PLWH (ages 18–60) completed a 10-test neurocognitive battery yielding a global composite and five domains (learning, memory, executive functioning, motor, processing speed). Past-year cannabis use (grams) was categorized as none/low/high and modeled with orthogonal linear and quadratic contrasts. HIV disease severity was modeled as a latent factor indicated by current CD4⁺, nadir CD4⁺, and viral load. Regression models tested main effects and interactions while adjusting for age, education, race/ethnicity, and past-year alcohol use.

Results. Quadratic cannabis effects were significant for global neurocognition ($\beta = -.19$, $p = .042$), learning neurocognition ($\beta = -.31$, $p = .029$), and motor neurocognition ($\beta = -.25$, $p = .041$), whereas linear effects were not significant. HIV disease severity did not predict neurocognition and did not moderate the association between cannabis and neurocognitive outcomes. The quadratic pattern was compatible with an inverted-U across none, low, and high cannabis use, with the clearest effects in learning and motor neurocognition.

Significance. Cannabis by neurocognitive associations in PLWH may be modest and nonlinear, rather than uniformly harmful or beneficial, and may not depend on disease severity in ART-treated cohorts. Results support explicit tests of nonlinearity in cannabis models and motivate longitudinal studies using continuous cannabis metrics and repeated biomarkers to clarify directionality and thresholds relevant to clinical counseling.

45 - Dayanne Antonio, "Multimodal predictors of psychosocial stress tolerance: subjective reactivity and frontoparietal causal dynamics"

Individual differences in tolerance to acute stress are substantial and consequential. Stressors may be psychosocial (e.g., evaluation, conflict, time pressure) or physical (e.g., pain), but the mechanisms linking subjective appraisal, sympathetic arousal, and control-network dynamics to tolerance remain poorly characterized, in part because these domains are often studied separately. Objective: Predict tolerance to the Socially Evaluated Cold Pressor Test (SECPT) from multimodal markers spanning self-report, electrodermal activity (EDA), and EEG time-domain Granger connectivity, to quantify how these responses explain individual differences in tolerance. Thirty healthy adults completed a 5-min seated baseline followed by the SECPT (cold-water immersion with social evaluation). Pre- and post-self-reports (stress, pain, affect, arousal, dominance), continuous EDA, and EEG were collected. Granger features were computed over a predefined frontoparietal montage (F3/F4, C3/C4, P3/P4) and expressed as reactivity, and EDA indices were baseline-normalized. Tolerance was predicted using stratified 5-fold cross-validation with target transformations to address ceiling effects; model drivers were interpreted with SHAP. Mean tolerance was 153.5 ± 43.2 s, with 70% at the 180-s ceiling. A Random Forest regressor explained 23.5% of the variance in tolerance. Higher Stress Response Index (greater perceived stress, pain, and arousal reactivity) predicted longer tolerance, whereas stronger frontoparietal causal connectivity (directed influence) predicted shorter tolerance. The SECPT increased stress, pain, and arousal while reducing valence and dominance; EDA showed sympathetic-dominant activation with an early peak and habituation, and global FPN Granger strength decreased from baseline ($\Delta = -0.0134$). This work contributes a proof-of-concept strategy for mapping psychosocial stress tolerance onto interpretable, multimodal markers spanning perception, autonomic arousal, and directed EEG connectivity. In cross-validated models interpreted with SHAP, tolerance was best captured by the interaction between a Stress Response Index and FPN causal dynamics, indicating that tolerance reflects active engagement and regulation (e.g., challenge appraisal, inhibitory control, stress-induced pain modulation) but is undermined when executive-control dynamics become overly constrained or asymmetric. Interpretable markers spanning self-report, EDA, and FPN-directed connectivity provide a foundation for future personalized stress-tolerance profiling and targeted training (e.g., reappraisal, attentional control, paced breathing/biofeedback). Modeling within-task dynamics may clarify transitions from peak discomfort to habituation, informing resilience interventions and optimized stress-exposure dosing.

46 - Amdad Ahmed Awsaf, "A Structural Equation Model for Youths' STEM Identity Development: Impact of Contextual STEM Learning Experiences"

STEM identity has powerful predictive value, often shaping students' long-term persistence in science, technology, engineering, and mathematics. However, identity development requires intentional, targeted efforts grounded in understanding how specific learning experiences shape youths' identities. Also, much of the research is yet to map out the general contexts and characteristics of a comprehensive set of experiences that contribute to STEM identity development. Our current study examined how pre-college STEM-related experiences influence STEM identity development among 1,134 minoritized youth studying at various Minority Serving Institutions nationwide. Using Structural Equation Modeling, we tested relationships among three STEM identity constructs (i.e., performance-competence, recognition, and interest) and eight pre-college experiences occurring in both formal and informal learning contexts. Our results illustrated that STEM interest ($\beta = 0.44$) and recognition ($\beta = 0.46$) directly predicted STEM identity, with performance-competence mediating these relationships. Notably, among these experiences, teacher recommendations emerged as the strongest predictor of performance-competence ($\beta = 0.257$), followed by being invited to answer questions in STEM classes ($\beta = 0.165$). Positive experiences with STEM programs significantly strengthened performance-competence, while negative out-of-school STEM experiences decreased it ($\beta = -0.061$). Interestingly, negative in-school experiences did not significantly predict reduced identity outcomes, challenging widespread assumptions in the literature about the primacy of preventing negative experiences. Our findings reveal performance-competence as the primary pathway through which contextual experiences influence STEM identity development. This challenges conventional interventions that target interest or recognition directly and instead advocates competence-building strategies as more effective. The study extends prior identity models by demonstrating that psychological mechanisms identified in college populations also operate in pre-college youth, evidencing the long-term developmental impact of early experiences on identity formation. These findings offer actionable implications for educational practice, for example, fostering classroom environments where all students feel safe answering questions, providing meaningful teacher recommendations, and creating accessible STEM program opportunities can intentionally build confidence and belonging. As such, instead of exclusively preventing negative experiences, educators should prioritize designing positive, competence-affirming experiences. This work moves beyond generic equity calls toward evidence-based practices that expand access to STEM success, particularly for those whose participation in STEM has remained disproportionately low.

47 - Shivanna Birbal, “The Lived Experiences of Special Education Teachers Implementing PBIS with Students with Moderate to Severe Disabilities”

Positive Behavioral Interventions and Supports (PBIS) was widely recognized as an evidence-based framework shown to improve academic, social, and behavioral outcomes for students with disabilities (Arway, 2023). However, despite its empirical support, PBIS remained under-examined and inconsistently implemented in self-contained classrooms, serving students with moderate to severe intellectual and developmental disabilities. This gap reflected systemic failures to address instructional, behavioral, and cultural complexities within high-need special education environments. Consequently, PBIS implementation in these settings often lacked fidelity and sustainability, limiting effectiveness for students with the most intensive needs.

This qualitative study argued that understanding PBIS effectiveness in self-contained classrooms required centering the lived experiences of special education teachers. Guided by Bronfenbrenner’s Ecological Systems Theory, the study examined how teachers interpreted, adapted, and enacted PBIS practices while working with students who presented significant behavioral, communication, and developmental challenges. Data were collected through in-depth, semi-structured interviews with eight to ten special education teachers. Reflexive Thematic Analysis was used to identify patterns related to implementation, adaptation, and systemic constraints.

Findings indicated that chronic teacher burnout strongly influenced PBIS implementation. Participants described emotional exhaustion, role overload, and reduced professional efficacy, intensified by limited administrative support and unrealistic expectations. Teachers reported persistent challenges, including high behavioral demands, inadequate staffing, and insufficient time for planning and collaboration. PBIS trainings were frequently described as brief, generic, and designed for general education contexts, offering limited guidance for adapting practices to self-contained classrooms or culturally and linguistically diverse learners. Consequently, teachers relied on trial-and-error approaches and informal peer support.

Limited access to instructional resources, behavioral specialists, and sustained professional development further constrained implementation of fidelity. These conditions contributed to frustration, disengagement, and attrition risk, reinforcing cycles of burnout, and inconsistent practice. By centering teacher’s voice, the study underscored the need for context-specific training, sustained professional learning, and comprehensive school-wide support systems tailored to high-need special education environments. Ultimately, the study contributed to a more equitable and realistic understanding of PBIS implementation and offered implications for improving behavioral supports for students with complex needs. These findings informed policy, leadership, and practice by emphasizing sustainability, equity, and teacher-centered implementation priorities statewide.

48 - Monique Blake, “The impact of quality of service, sense of community, and brand love on guest satisfaction and intention to return to wellness destinations”

Problem Statement. According to the Global Wellness Institute, wellness tourism is one of the fastest-growing segments of the global travel industry, yet empirical research has not fully examined how psychological and relational factors impact guest satisfaction and loyalty. Existing studies primarily focus on service quality and functional outcomes, with limited attention to the emotional and community-based mechanisms that influence repeat visits in wellness tourism settings.

Research Objectives. This study explores how quality of experience, sense of community, and brand love impact satisfaction and the likelihood of returning among wellness tourists. Guided by Self-Determination Theory and the Theory of Planned Behavior, the research explains the mediating role of satisfaction and identifies key factors that enhance loyalty and guests’ intention to return.

Research Methodology. A quantitative research design was used, utilizing survey data from 98 wellness tourists. An exploratory factor analysis was performed to confirm the measurement structure of the study constructs, and further analyses examined the moderating effects of wellness knowledge, perceived luxury, and accessibility. Participant demographics aligned with those of the broader spa customer segment, indicating that the sample accurately represents the target group.

Results/Conclusions. Findings show that satisfaction plays a key role in linking experience quality, sense of community, brand love, and the intention to return. Wellness knowledge, perceived luxury, and accessibility further enhance these links, indicating that both psychological fulfillment and situational factors are important for building loyalty. Therefore, satisfaction acts as a vital mediator between emotional engagement and behavioral intention in wellness tourism.

Contribution/Significance. This study advances research on wellness tourism and hospitality by integrating experiential, relational, and emotional constructs within a theoretically grounded loyalty framework. It extends existing work by empirically confirming satisfaction as a key mediator and by identifying moderating factors that are highly relevant to wellness travel decision-making.

Broader Impacts. For practice, the findings offer actionable insights for wellness tourism operators, destination managers, and hospitality leaders aiming to design loyalty-focused experiences. By emphasizing community, emotional bonds, and meaningful experiences, this research supports the development of more sustainable, guest-centric wellness tourism models.

49 - Michael Borbolla, "Whaling vs. Whale-Watching: Social-economic evaluation of competing practices in St. Vincent, St. Vincent and the Grenadines"

Tourism has become a dominant economic sector in St. Vincent, St. Vincent and the Grenadines (SVG), increasingly intersecting with long-standing cultural and livelihood practices. One such practice is small-cetacean hunting based in Barrouallie, where whalers and vendors have historically captured, processed, and sold pilot whales and other small cetaceans. The rapid expansion of whale-watching has introduced new economic opportunities while also generating tensions surrounding resource use, cultural values, and marine governance. This study evaluates the social-economic contributions of small-cetacean hunting and whale-watching, examines the extent of their spatial and operational overlap, and investigates stakeholder perceptions regarding coexistence, competition, and conflict. To address these objectives, we integrate semi-structured interviews with whalers, vendors, and whale-watching operators alongside economic modeling. Estimates of costs, revenues, and total use values are developed to compare sector performance, while qualitative interview data are analyzed using a grounded theory approach to identify emergent themes related to livelihoods, cultural significance, perceived conflicts, and adaptive strategies. Findings clarify the economic structures of both sectors, including start-up costs, revenue variability, and perceived profitability, and highlight areas of spatial overlap. Stakeholder perspectives reveal a complex social landscape characterized by both tensions and potential pathways for coexistence. This research advances understanding of how traditional extractive practices and non-consumptive tourism interact within small-island social-ecological systems. By combining qualitative and quantitative evidence, the study provides an empirically grounded comparison of economic value, cultural importance, and conflict dynamics. The results inform local policy discussions on marine resource management, cultural heritage, and sustainable development, while contributing more broadly to global debates on balancing livelihood security, tourism growth, and ecological sustainability in regions where whaling and wildlife tourism converge.

50 - Emilie Christiansen, "Topography, Accessibility, and the Built Environment: Explaining Spatial Patterns of Bicycle Theft"

In many cities worldwide, cycling is gaining popularity as a mode of transportation, offering environmental, health, and financial benefits. Yet research suggests that bicycle theft continues to deter individuals from cycling, limiting the broader adoption of this sustainable form of transportation. Although a growing body of criminological research has examined how features of the built and social environment influences crime patterns, the role of topography remains largely overlooked—particularly concerning bicycle theft. To date, few studies have explored how slope and hilliness relate to criminal behavior. This study contributes to this emerging area by applying environmental criminological theories to examine the spatial distribution of bicycle thefts in San Francisco, California, from 2018 to 2023 (n= 2,762 bicycle thefts). Various topographical measures, along with spatial access measures of built environment features, street centrality, population estimates, and social disorganization indices were included in the final negative binomial regression models. Findings show that street slope was negatively associated with bicycle theft, with streets with steeper slope gradients experiencing fewer thefts. Multiple infrastructure-related variables were significant predictors of bicycle theft, including bicycle racks, transit stops, and bike share stations while street centrality was not associated with theft. The theoretical implications of this study suggest that criminological research should incorporate measures of topography as these factors influence crime patterns by shaping offender mobility, target availability, and escape feasibility. Integrating these insights into bicycle theft prevention may help promote cycling as a sustainable mode of urban transportation.

51 - Andres Davila, "Family Dynamics and Youth Risk for Substance Abuse: A Study in Chile"

Chile is regarded as one of the most stable countries in Latin America; however, the country has recently been observing a rise in illicit drug trafficking and consumption. Despite maintaining a secure economy and democracy after the dictatorship of Augusto Pinochet, Chile is struggling with the rise of crime and drug trafficking. This has caused growing concerns among the general public, specifically how it has impacted Chilean youth and what it can mean for the future. While external social factors contribute to the rise of drug consumption among Chilean adolescents, it is important to note that family dynamics can impact youth and be a predictive factor for the rise of drug consumption. This case study investigates what combinations of risk factors predict the youth groups most likely to consume drugs, through the use of predictive modeling. To determine the combinations, data were obtained from the Servicio Nacional para la Prevención y Rehabilitación del Consumo de Drogas y Alcohol (SENDA), a department of the Chilean Interior Ministry. The data comes from an annual questionnaire given to students in the 8° básico y 4° medio in the Chilean school system (equivalent to 8th grade and 12th grade in the U.S. school system). The questions in the survey relate to the family dynamics at home, their history of drug consumption, and their academic performance in school. The dataset will have responses from 2001 to 2013 for the analysis. This analysis will include preliminary patterns within the region, such as demographic patterns and descriptive statistics, to determine which factors can be incorporated into the predictive modeling. The predictive modeling generates an understanding of how drug crimes and substance abuse go hand-in-hand in Chile, a heavily debated issue during the 2025 presidential elections. In addition, it provides insights into how Chile responds to substance treatment policies and tackles drug trafficking throughout the nation. The country already has several approaches, such as the Social Competence Promotion Program among Young Adolescents, which will be observed how effective these programs are based on the questionnaires and predictive model.

52 - Johanna Desormont, "Evaluating Sense of Belonging Among Undocumented Students Through UndocuTalks"

Background: Undocumented students face systemic challenges in higher education, often struggling to establish a sense of belonging within traditional university settings. The UndocuTalks events, part of the Here to Dream initiative, provide a dedicated space for community-building, empowerment, and cultural identity reinforcement. This study seeks to evaluate the extent to which these events enhance students' sense of belonging compared to their overall university experience. Methods: A longitudinal, mixed-methods design will assess changes in belonging over time across multiple UndocuTalks sessions (virtual and in-person). Quantitative measures include repeated Likert-scale surveys tracking belonging, social inclusion, and perceived support across up to 9 time points. Qualitative data from session recordings and anonymous follow-up interviews will provide contextualized personal narratives. Data integration involves thematic analysis using open coding to align insights with UndocuCrit constructs. Analysis will apply mixed-effects models and growth curve modeling to examine longitudinal trends, with paired comparisons assessing differences between virtual and in-person sessions. Expected Results: We hypothesize that Dreamers will report a higher sense of belonging and social inclusion within the UndocuTalks/Here to Dream community compared to their broader university experience. Differences between virtual and in-person sessions may also emerge, providing insight into the most effective engagement methods. Implications: Findings will offer evidence on how community-based interventions enhance undocumented students' belonging, informing institutional support strategies and policies. This study highlights the value of a mixed-methods approach in capturing both measurable and nuanced experiences, offering a model for inclusive educational initiatives.

53 - Arrianna Edwards, "Mapping Disability Related Disaster Vulnerability: Social Vulnerability Index Patterns Across Florida Counties"

Residents with disabilities in Florida face disproportionate risks related to disaster exposure, mental health burden, and barriers to access, yet these risks are not evenly distributed across geographic areas. County-level patterns in social vulnerability, particularly those related to disability, minority status, housing, transportation, and socioeconomic conditions, may intersect with Florida's high hurricane exposure to intensify inequities. Vulnerability patterns vary across major Florida counties is needed to identify geographic disparities that contribute to increased disaster risk and adverse outcomes for people with disabilities This poster examines three domains: socioeconomic status, household composition & disability, and minority status and language across four Florida counties. The objective is to identify disparities that increase disaster risk by analyzing resource constraints, county-level variability, and infrastructural challenges that undermine the ability to meet the needs of IWD during disasters. Approximately 1.2 million individuals with disabilities were impacted by a Category 5 hurricane individuals with disabilities. Within Florida, approximately 13-14% of residents live with a disability. Many of these residents live in counties with limited resources, exposed to poverty, and communication barriers. The data from the SVI themes 1, 2, and 3 demonstrate disadvantages in minority status, language access, financial difficulties, age, and disability prevalence. The SVI 2020 county-level data were reviewed for Miami-Dade, Broward, Hillsborough, and Escambia. Socioeconomic status (theme 1), household composition & disability (theme 2), and minority status (theme 3) were analyzed. Miami-Dade, Broward, Hillsborough, and Escambia demonstrated distinct vulnerability themes. Miami-Dade and Broward displayed higher levels of vulnerability among minority/language barriers. Hillsborough presented with moderate socio-economic vulnerability but significant levels of household competition & disability. Lastly, Escambia displayed higher levels of vulnerability across all three themes. These results indicate that high-SVI counties face increased barriers to sheltering, continuity of care, and disaster preparedness. Examining the themes presented in 1,2 and 3 offers a clear and actionable path for addressing disability-related communication barriers and socioeconomic disadvantages. As disasters continue to occur and intensify, disaster planning for the marginalized population is vital. By examining the inequalities and disparities, researchers and practitioners can identify effective strategies that help individuals with disabilities prepare and recover from disasters.

54 - Fahima Nasrin Eva, “Dual Use of Cigarettes and E-Cigarettes Among U.S. Young Adults: The Role of Race/Ethnicity and Mental Distress, Behavioral Risk Factor Surveillance System, 2024”

Background

Dual use of cigarettes and e-cigarettes is rising among U.S. young adults. Mental distress, racial/ethnic disparities, and healthcare barriers intersect to shape use patterns, yet nationally representative studies grounded in the Minority Stress Model remain scarce to inform equity-focused interventions.

Objective

This study investigates the relationship between mental distress and dual use of cigarettes and e-cigarettes among U.S. young adults aged 18–24, with particular attention to racial/ethnic differences and indicators of healthcare access.

Method

A cross-sectional analysis of 2024 Behavioral Risk Factor Surveillance System (BRFSS) data was conducted among 15,149 young adults aged 18–24. Survey-weighted logistic regression estimated adjusted odds ratios (AORs) for dual use (vs non-use) in relation to mental distress, depressive disorder, race/ethnicity, and sociodemographic and healthcare-access factors. Analyses accounted for complex survey design, used two-sided $p < 0.05$ to define statistical significance, and were conducted in SAS 9.4.

Result

Among 15,149 U.S. young adults aged 18–24 in BRFSS 2024, the sample was predominantly male (58.2%), Non-Hispanic White (59.7%), and urban residents (91.7%). Overall, 3.3% were dual users of cigarettes and e-cigarettes. In adjusted models, females had lower odds of dual use than males (AOR 0.38, 95% CI 0.28–0.54, $p < 0.001$), as did non-Hispanic Black versus non-Hispanic White adults (AOR 0.31, 95% CI 0.16–0.59, $p < 0.001$). In contrast, not completing high school (AOR 2.88, 95% CI 1.52–5.47, $p < 0.001$) and rural residence (AOR 2.72, 95% CI 1.67–4.42, $p < 0.001$) were associated with higher odds of dual use. Frequent mental distress (AOR 2.13, 95% CI 1.32–3.45, $p = 0.002$), depressive disorder (AOR 2.60, 95% CI 1.84–3.67, $p < 0.001$), and delayed routine checkups (2–5 years: AOR 2.57, 95% CI 1.58–4.19, $p < 0.001$; ≥ 5 years: AOR 3.24, 95% CI 1.97–5.33, $p < 0.001$) were significantly associated with dual use. No significant interaction was found between race/ethnicity and mental distress in predicting dual use.

Conclusion

Dual cigarette and e-cigarette use was relatively uncommon but highly concentrated among men, those with lower educational attainment, rural residents, and young adults experiencing frequent mental distress, depressive disorder, and barriers to healthcare access. Mental distress remained a strong correlate of dual use across racial/ethnic groups.

55 - Ana Luiza Ferreira Terra Pinto, “Leadership Development as a Catalyst for Sustainable Civic Engagement”

Public Institutions face challenges in attracting the younger generations to the public sector (McKinsey & Company, 2025). The paper is focused on the use of leadership development programs to engage the younger generations using civic education and engagement to create the new generation of public leaders. Public servants need the ability to maintain a relationship of trust with citizens, establishing the legitimacy of public service actions. Since citizens are the “public” in public administration (Kim, Rho, & Teo, 2024), civic education is central to the community well-being. Civic education role is to educate students on the ways that federal and local governments impact the lives of citizens, how the systems operate, and how the government is structured, including the roles of local and federal government (Matto et al., 2017). Therefore, leading to an increase in the awareness of how the public sector affects our life. To explore the importance of leadership programs to foster civic engagement among the younger generations, the study employs a literature review methodology. Through this literature review is possible to examine how leadership development programs promote the connections of the younger generations to public service by fostering civic engagement, leadership skills, public service motivation and values, and networking with stakeholders and communities. The study offers insights for policymakers, educators and institutions on how to strengthen the leadership development of the younger generations to revitalize public institutions

56 - Sofia Fraile, “Hippocampal Microstructure and Associative Learning: Evidence from Trace Eye-Blink Conditioning in Early Childhood”

No reliable and valid measure of hippocampal function in very young children is currently available. Trace eye-blink conditioning (EBC), an associative learning task, has been well established in animal models as hippocampus-dependent (Christian & Thompson, 2003), and prior human studies have reported links between trace EBC performance and hippocampal activation (Cheng et al., 2008). The present study re-examines this relationship by replicating earlier findings in a larger sample, applying more robust metrics of hippocampal structure, and extending hypotheses to consider both hippocampal subfields and anterior–posterior orientation. As part of a larger project, trace EBC (measured by conditioned response latency) and diffusion magnetic resonance imaging (dMRI) were collected from children aged 4–6 years (Vieites et al., 2023). dMRI captures the movement of water molecules within tissue (Zhao et al., 2021), and advanced modeling approaches such as Restricted Spectrum Imaging (RSI) can quantify microstructural organization and cellular compartmentalization (Palmer et al., 2021). These measures provide a proxy for hippocampal development at the cellular level. We hypothesize that greater hippocampal microstructural integrity will be associated with shorter conditioned response latencies. Moreover, we predict that the CA1 subfield and the anterior hippocampus will show stronger associations with task performance than their respective counterparts. By leveraging advanced diffusion methods sensitive to synaptic pruning and related developmental processes, this study aims to improve the characterization of hippocampal maturation in early childhood and better understand emerging cognitive functions at this stage. Findings will advance understanding of the hippocampal structure-function relationship, provide evidence for the implementation of robust neuroimaging modeling in pediatric samples, and contribute to the development of a reliable, non-invasive tool for assessing hippocampal function in young children. With a behaviorally accessible marker of hippocampal development, this work can contribute to earlier identification of neurodevelopmental conditions and inform developmentally sensitive educational and clinical interventions.

57 - Breana Frazier, "Examining Commercial Sexual Exploitation of Children"

The commercial sexual exploitation of children (CSEC) is a serious public health issue globally (Benavente et al., 2021) and in the US (Hounmenou & O'Grady, 2019) that demands urgent and effective intervention through services (Rothman et al., 2019). CSEC is defined as a range of activities and crime that involve the sexual abuse or exploitation of a child for financial benefits given or received by any person. CSEC is not only viewed as a severe form of child maltreatment but is also a subset of human trafficking that includes both online and in-person exploitation. (Bounds et al., 2015; Brien et al., 2024). Approximately 808,500 children from grades 7 to 12 in the United States have exchanged sex for drugs or money (Kim et al., 2022). Despite researchers growing interest of CSEC, there are still various gaps in our understanding on the topic of CSEC and the types of services that are provided for youth victims (Franchino-Olsen, 2019). For this study, I will be conducting a scoping review to investigate the existing literature on CSEC and to examine how CSEC affects two opposite and vulnerable populations. So far, my research shows a significant finding that the lack of knowledge on this crime continues to hinder law enforcement's ability to identify it. The aim of this research is to narrow the gap in our understanding of this crime and provide clarity on how to identify it so that victims are directed to services instead of the juvenile justice system.

58 - Elizabeth Garcia, “Psychosocial and Behavioral Interventions to Support Treatment Adherence in Adults with Pre-Dialysis CKD: A Systematic Review”

Problem Statement: Chronic kidney disease (CKD) affects approximately 35.5 million adults in the United States, yet nearly 90% remain unaware of their diagnosis. Effective CKD management includes adherence to medication and dietary restrictions. However, nonadherence continues to be a problem. Studies have shown that 12 to 53% of adults with CKD are nonadherent to medications and 20-78% fail to follow dietary restrictions. Thus, contributing to higher mortality, faster disease progression, and increased hospitalization.

Research Objective: The purpose of this systematic review is to evaluate the effectiveness of psychosocial and behavioral interventions in improving treatment adherence among adults with CKD in pre-dialysis.

Method: Guided by Cochrane Handbook protocols and guidelines, a search across seven databases (2000 – 2025) was used to identify randomized controlled trials. Eligible studies involved adults with CKD stages 3 to 5 receiving psychosocial and/or behavioral interventions. Five trials met the inclusion criteria. The Cochrane RoB 2.0 tool was used to assess risk of bias and due to the differences in adherence outcomes, the findings were summarized using a narrative approach.

Results/Conclusions: Four articles reported significant improvements in dietary adherence, where lower amounts of protein ($p = 0.003$), sodium ($p < 0.001$), and fat ($p = 0.010$), phosphorus ($p = .009$) were shown, and improved Mediterranean diet adherence ($p < 0.001$; $p = 0.024$). Findings for medication adherence were mixed, with only one pharmacist-led intervention showing significant improvements ($p < 0.001$). None of the included articles were rated as a low risk of bias across all domains. Across the included studies, psychosocial and behavioral interventions showed significant improvements in dietary adherence than in medication.

Contribution/Significance: This systematic review contributes to the literature by synthesizing evidence from psychosocial and behavioral interventions among adults with CKD stages 3 to 5 and by identifying anticipatory grief as a overlooked factor that should be considered in future CKD treatment adherence research.

Broader Impacts: These findings highlight the importance of developing interdisciplinary, patient-centered interventions that include psychosocial and emotional support to improve long-term CKD care, with the potential to delay kidney failure.

59 - Jamie Haynes, “Organizational Climate and Employee Outcomes in the U.S. Hospitality Industry”

The U.S. hospitality industry continues to face persistent challenges related to employee turnover, productivity, and engagement. While prior research has examined job satisfaction as a predictor of employee outcomes, less attention has been given to the broader role of organizational climate in shaping workforce stability and performance. This gap is particularly evident in studies that examine organizational climate as a multidimensional construct and its relationship to productivity, employee engagement, turnover intentions, and perceptions of the work environment.

The purpose of this study is to examine the motivational and organizational climate factors that influence job turnover and productivity among employees in the U.S. hospitality industry. The study focuses on key dimensions of organizational climate, including leadership quality, training and development, decision-making participation, work-life balance, collaborative climate, psychological safety, and job security, and evaluates their relationships with employee productivity, engagement, turnover intentions, and perceptions of the work environment.

A quantitative, survey-based research design is employed. Data are collected from a purposive sample of employees working in major hotel organizations within the U.S. hospitality industry. A structured Likert-scale questionnaire is used, drawing from established and adapted measurement instruments to assess organizational climate constructs and employee outcomes. Data analysis includes descriptive statistics, confirmatory factor analysis (CFA) to assess construct validity, and structural equation modeling (SEM) to examine relationships among latent variables.

The findings indicate that organizational climate is significantly associated with employee productivity, engagement, turnover intentions, and perceptions of the work environment. Several climate dimensions, particularly leadership quality, employee involvement in decision-making, and psychological safety, demonstrate meaningful relationships with workforce outcomes.

This study contributes to the hospitality management literature by empirically validating organizational climate as a reflective, multidimensional construct and by extending prior job satisfaction research to include productivity and work environment outcomes. The results provide practical insights for hospitality leaders seeking to improve employee retention, performance, and overall organizational effectiveness.

Broader impacts include supporting evidence-based workforce strategies, informing leadership development initiatives, and promoting more sustainable human capital practices across the hospitality industry.

60 - Jeann Hernandez, "Preference of P-Stranded Sentences by L1 Spanish Speakers and Heritage Speakers of Spanish"

Preposition Stranding (p-stranding) is a complex construction in English where a preposition is separated from its object, as in "Where are you from?". However, this syntactic construction is perceived as ungrammatical in speakers of Spanish, as in "*¿Dónde eres de?", which is not allowed in the language. Depiante and Thompson (2013) explored p-stranding in Spanish in heritage speakers compared to native monolingual speakers. More recently, Koronkiewicz (2022) and Delgado & Koronkiewicz (2025) studied p-stranding in US Spanish-English bilinguals. Nonetheless, there is yet to be a focus on how p-stranding in English is interpreted by Heritage Speakers of Spanish (HSS) and L1 Spanish speakers (L1S). The purpose of this study is to compare how non-stranded (Pied-Piped) sentences are preferred over p-stranded sentences between L1S and HSS. Further, we compared whether different complex sentence structures (clefting, WH-question, relative clause, topicalization) affected the outcome of p-stranding. The study consisted of three groups of 40 participants: L1 Spanish speakers who are learning English, Heritage Speakers of Spanish, and Monolingual Speakers of English (MES). The participants were assigned a grammaticality judgement task which consisted of a 70-question questionnaire via Qualtrics. Primary analyses were conducted using linear mixed-effects models. We adopted a stepwise model-comparison approach to assess the contribution of fixed effects. The results of statistical analysis show that acceptability differs systematically across construction types ($p < .001$). Although there were no significant differences across groups (MES, L1S, and HSS) overall ($p = .112$), p-stranding acceptability depends on the syntactic construction. We saw significant group differences in L1S compared to MES and HSS in WH-question constructions ($p = 0.007$). The findings suggest that there may be a link between the dominance of a language and the transfer that may occur in different syntactic structures in the study of second language acquisition. Moreover, the study supports the idea that there is a separate system in heritage speakers that does not compare to the system of a monolingual speaker or a sequential bilingual speaker (Polinsky 2018).

63 - Tasmin Hossain, "Perceived Supervisory Support: Does Informal Supervisory Position Matters?"

Research has extensively discussed the need for organizational management to ensure equitable supervisory support, as it fosters organizational commitment, a favourable culture of leadership development, and career aspiration among employees. Management often leverages self-managed teams and decentralizes supervisory responsibilities among employees to promote equitable supervisory support (Rubel, 2023). However, the public management literature discusses that work teams informally supervised by employees, and not managers, may find it difficult to distinguish the feeling of being supported by a formal supervisor or the organization (Burns, 2016; Boyer & Edmondson, 2015). Meanwhile, managers who permit employees to supervise work teams or be team leaders tend to reduce turnover intentions, foster employees' innovative behaviour and interpersonal relationships, and improve organizational commitment (Damanpour & Schneider, 2009). This study advances management and leadership theory and practice by exploring the relationship between informal supervisory positions and perceived supervisory support. The study further shows how team leaders' organizational commitment mediates the relationship. It broadens our understanding of how perceived organizational support influences the relationship between team leaders' organizational commitment and their perceived supervisory support (PSS) by integrating a moderated-mediation analysis. This study contributes to the discourse around the need for new public management to reevaluate the management and leadership framework of federal agencies. The study uses the Federal Employee Viewpoint Survey (FEVS) 2023 and employs OLS regression, integrating moderate-mediation analysis, to test the hypotheses. The 2023 FEVS data present an opportunity to analyze both the employee-focused variables and the employee engagement index—a newly introduced composite index from which we chose the PSS as the dependent variable, and informal leadership position (Team Leader) as the independent variable.

64 - Margaret Johansson, "Understanding Comorbid ADHD and Disruptive Behavior Disorders Through Executive Functioning"

Background/Problem Statement: As part of early intervention efforts, it is important to examine potentially malleable characteristics, such as executive functioning (EF), that may differentiate young children with pure Attention-Deficit/Hyperactivity Disorder (ADHD) from those with comorbidities. Though deficits in EF have been theorized to be a developmental pathway of Disruptive Behavior Disorder (DBDs) and callous-unemotional behaviors (CU), our understanding of EF differences between children with pure ADHD and those with comorbidities is limited. The present study sought to fill this gap by exploring how common ADHD comorbidities, such as DBDs and CU, categorically and dimensionally relate to EF. Objective: To explore how comorbidities associated with Attention-Deficit/Hyperactivity Disorder (ADHD) during early childhood like Disruptive Behavior Disorder (DBD) and/or the presence of callous-unemotional behaviors (CU) relate to executive functioning (EF). Method: Participants were 323 young children (68.7% boys; Mage = 5.47, SD = 0.77, 81.1% Latinx) with ADHD (n = 46), ADHD+DBD (n = 129), and typically developing (TD; n = 148). Parent/teacher ratings of ADHD, DBD symptoms, and CU were collected at baseline along with a multimodal assessment of EF including tasks and parent/teacher ratings. Results: Univariate analyses of covariance (ANCOVAs) indicated that while children diagnosed with ADHD and ADHD+DBD have worse EF deficits than TD children (Cohen's d's range from 0.34-2.35), they do not differ from each other. Regression analyses showed that parent-/teacher-reported ADHD symptoms were the strongest predictors of EF deficits (task-based and parent/teacher reports; β range from -0.43-1.00). CU also related to EF across two tasks and parent-/teacher-rated EF problems (β range -0.15-0.16). Conclusions/Significance: Young children with ADHD have the most EF deficits, regardless of DBD comorbidity. The presence of CU does appear to contribute to worse EF, even when accounting for ADHD and DBD symptomology. Future work should examine whether longitudinal changes of CU (either through development or intervention) correspond to changes in EF. Broader Impact: Individualizing treatment for children with ADHD and comorbid CU to have a stronger focus on promoting EF may be beneficial to this group.

65 - Kayla Jolly, "Ecological Factors and Emotional Neglect Risk"

Problem Statement: Emotional neglect (EN) is an understudied form of child abuse. This lack of research has stymied progress towards understanding subtypes of EN and what factors are associated with perpetration. **Research Objectives:** We sought to understand how different levels of factors were associated with caregivers' risk of perpetrating specific EN subtypes. **Research Methodology:** Structural equation modeling (SEM) of a secondary sample of caregivers (N = 373, M = 41.1 years) was used to analyze risk factors and six EN subtypes (i.e., emotional distance [ED], disinvolvement [D], poor emotion socialization [PES], role confusion [RC], psychological control [PC], and emotional abuse [EA]). Five models were created: child factors and parent factors (i.e., age, gender, race, sex), caregiver individual factors (e.g., impulse, stress, emotion regulation), family factors (i.e., household number, relationship status), and macro factors (i.e., income, monetary worry, unemployment). **Results/Conclusions:** SEM results verified that different factors had different relationships with the EN subtypes. Notable associations included (a) non-cisgendered children and PC (17.897, $p = 0.000$) and PES (26.560, $p < 0.005$), (b) male parents and PES perpetration (14.171, $p = 0.000$), (c) and higher income and decreased RC (-0.219, $p < 0.05$), PC (-0.783, $p < 0.05$) and PES (-2.241, $p < 0.005$). Additionally, findings highlighted that some factors were associated with an increased risk of an EN subtype (e.g., higher household number and EA), but decreased the risk of others (e.g., higher household number and PC and PES). **Contribution/Significance:** The findings of the current study help to fill the research gap of EN, what factors may increase the risk of perpetration, and how these factors relate to specific subtypes of EN. Findings also highlight that factors commonly associated with risk may be protective in different circumstances and thus, have a more nuanced impact than thought. **Broader Impacts:** The results of this study can be used to aid in the development of interventions to address EN that better address risk factors and help shape such interventions to be more strength-based. Additionally, the results highlight the necessity of more rigorous methods with EN and focus on studying EN as a multidimensional construct.

66 - Junhee Kim, “Testing Cross-National Measurement Invariance of TIMSS 2023 EAB Framework and Implications in Environmental Education Research”

From the energy demands of artificial intelligence to the spread of microplastics and “forever chemicals,” contemporary environmental problems sit at the intersection of science, society, and policy. IEA, the organization that administers the TIMSS & PIRLS international assessments, emphasizes the need for students to develop both environmental knowledge and enact environmentally responsive values. To advance research in this area, the 2023 administration of TIMSS includes a new Environmental Attitudes and Behaviors (EAB) framework. However, the types of statistically valid international comparisons that can be made with these data depend on the degree of measurement invariance established across education systems. Our current study investigates which cross-national comparisons are warranted for the TIMSS 2023 EAB data by examining the invariance of students’ environmental attitudes, behaviors, and related home and school factors. Using Multi-Group Confirmatory Factor Analysis (MG-CFA) across 55 education systems, we estimated configural, metric, and scalar models for student attitudes, student behaviors, home factors, and school factors. Our findings showed that the home and school constructs did not meet basic configural invariance criteria, precluding their use in international comparisons. Additionally, student attitudes demonstrated configural but not metric invariance, limiting analyses to within-country patterns and rendering cross-national comparisons of relationships or mean differences inappropriate. In contrast, student behaviors demonstrated metric but not scalar invariance, permitting cross-national comparisons of the strength of associations between behaviors and other variables, but not comparisons of latent mean levels. The findings from our research clarify the conditions under which the TIMSS 2023 EAB data can be used legitimately for environmental and STEM education research, offering concrete guidance on which international comparisons are and are not supported by the measurement properties of the constructs. By making these limits explicit, our study helps prevent misinterpretation of cross-national results, informs future refinement of international environmental attitude and behavior measures, and supports more responsible, equity-oriented use of large-scale assessment data in research, policy, and curriculum design.

67 - Jacqueline Krystel Loubeau, "Engagement barriers in HIV care among South Florida's Haitian immigrants"

Background: People Living with HIV (PLWH), particularly immigrant populations, face significant barriers to maintaining engagement in HIV care and adhering to treatment recommendations. Our study aimed to explore providers' perceptions of barriers to engaging in HIV care and achieving viral suppression among Haitian Immigrants Living with HIV (HILWH) in South Florida.

Methods: Between February and April 2024, a qualitative study was conducted using focus groups and in-depth interviews with 31 providers of HIV care and ancillary services. Domains of exploration included barriers to keeping clinic appointments, following antiretroviral treatment (ART), and achieving viral suppression.

Results: Providers identified the structural barrier of HIV stigma prevalent in the Haitian community and related psychosocial barriers as the foremost burden, with other barriers such as language and limited health literacy having a reinforcing effect. The most common psychosocial barriers identified were lack of basic knowledge and education about HIV, fear of HIV status disclosure, internalized stigma, lack of family support, or fear of rejection by family and friends. As structural barriers, providers reported a lack of transportation, education about HIV in the surrounding Haitian community, as well as work obligations.

Conclusions: Our findings suggest that intervention components tailored to the severity of these barriers may reverse the persistent pattern of lagging HIV health outcomes among HILWH and other immigrant populations.

68 - Kelsey Macdonald, "Infant Multisensory Attention Skills Serve As a Foundation For Child Self-Regulation"

Child self-regulation (managing behavior, attention, and emotions to achieve goals) is a cognitive skill that predicts a variety of developmental outcomes (e.g., academic achievement, social competence). Child cognitive skills (e.g., working memory) and environmental factors (e.g., socioeconomic status, SES) are well-established predictors of self-regulation. An important goal of developmental science is to identify early predictors (e.g., in infancy) of child behaviors, given that childhood skills are built upon the foundation of earlier skills. However, few infant predictors of child self-regulation have been identified. In infancy, multisensory attention skills (MASks) index early forms of attention control, including face-voice matching on the basis of temporal synchrony, and resisting distractors when attending to faces. Recent research shows these MASks predict later language, socioemotional, and cognitive outcomes. For example, both face-voice matching and resisting distractors at 12-months predicted working memory at 36-months. The present study extends these findings by characterizing developmental pathways from infant MASks to child working memory and to a new outcome, self-regulation. We predicted that better infant MASks (greater resistance to distractors when attending to faces, greater face-voice matching) would predict better child working memory and self-regulation.

Children (N=102) from a larger longitudinal study participated. Infant MASks (resistance to distractors, face-voice matching) were assessed at 12-months, using a video-based protocol (Multisensory Attention Assessment Protocol; Bahrack et al., 2018). Working memory was assessed at 36-months, and self-regulation was assessed at 48-72-months. SES was included as a covariate of working memory and self-regulation.

Structural equation modeling revealed that greater infant face-voice matching predicted greater infant resistance to distractors when attending to faces ($p=.03$), which, in turn, predicted better child working memory, controlling for SES ($p=.03$). In turn, working memory predicted better child self-regulation, controlling for SES ($p<.001$).

Findings were consistent with our predictions and provided the first evidence of a novel developmental pathway from basic infant attention skills to child working memory and self-regulation. Findings highlight early MASks as foundations for later cognitive skills. Further, these findings may help identify infants at-risk for poor self-regulation in later childhood. Infant MASks may serve as potential targets for early intervention.

69 - Praveen Manimangalam, "Why AI Tools Alone Don't Deliver Business Value: Evidence from AI-Enabled CRM Systems"

Problem Statement

Organizations across industries are making substantial investments in artificial intelligence (AI), particularly through AI-enabled customer relationship management (CRM) systems. While these technologies are widely promoted as drivers of efficiency, customer engagement, and revenue growth, many organizations struggle to realize consistent performance benefits. This gap between AI adoption and realized value raises an important question: why do AI tools often fail to generate the expected business outcomes?

Research Objectives

The objective of this study is to examine whether AI-enabled CRM technologies directly improve business performance or whether their effects depend on the development of organizational capabilities. Specifically, the research investigates how firms convert AI investments into operational, customer, and financial outcomes through capability building.

Research Methodology

This study draws on survey data from 300 organizations that have implemented AI-enabled CRM systems. Confirmatory factor analysis (CFA) and structural equation modeling (SEM) are used to test a capability-mediated performance framework. The analysis examines relationships among AI-integrated CRM functionalities, strategic AI investment, organizational capabilities, and business performance outcomes. Established reliability and model-fit criteria are applied to validate the measurement and structural models.

Results / Conclusions

Preliminary findings indicate that AI-enabled CRM technologies do not have a significant direct effect on business performance. Instead, their impact operates through organizational capabilities, including process automation capability, employee analytical expertise, and innovation capability. Organizations that invest in AI without strengthening these complementary capabilities experience limited performance gains. The results also suggest that industry context plays a conditioning role, with stronger capability effects observed in service-oriented firms.

Contribution / Significance

This research contributes to ongoing discussions on AI and digital transformation by shifting attention from technology adoption to capability conversion. It highlights the importance of organizational readiness in explaining why similar AI investments produce different outcomes across firms and provides an empirically tested framework linking AI, capabilities, and performance.

Broader Impacts

The study offers practical insights for managers, educators, and policymakers by emphasizing the need to align AI adoption with workforce development, process redesign, and organizational learning. For institutions and organizations investing in AI, the findings underscore pathways toward more effective, responsible, and sustainable use of emerging technologies.

70 - Helen Martinez, "Federal Grant Writing Methods: A Systematic Review"

Problem Statement

Securing federal funding is essential for advancing research, educator preparation, and service delivery within Special Education and Related Services (SERA) programs at Minority-Serving Institutions (MSIs). Despite the importance of such funding, limited scholarship has examined the challenges and effective strategies specific to these institutions in developing competitive federal proposals, leaving a gap in the literature concerning evidence-based grant writing practices that promote institutional equity and sustainability.

Research Objectives

This literature review sought to identify evidence-based approaches that improve the competitiveness and success of federal grant proposals in higher education, with a particular focus on SERA programs within MSIs. The review was guided by the following research question: What evidence-based approaches have been identified as effective in securing federal education grants in higher education?

Research Methodology

A systematic literature review was conducted using five databases: ERIC (ProQuest), Scopus, ASSIA, Education Source (EBSCOhost), and Gale in Context: College. Peer-reviewed studies published between 2015 and 2025 were included based on predefined inclusion and exclusion criteria. After a multi-stage screening process, ten studies met the final criteria. Data extraction followed a structured framework, and thematic analysis was employed to identify recurring patterns, practices, and strategic approaches.

Results/Conclusions

Findings revealed five key themes linked to successful federal grant acquisition: (1) professional development that builds proposal capacity, (2) collaboration within and beyond institutions, (3) supportive institutional infrastructure, (4) practical application of tools and data-driven templates, and (5) personal agency characterized by persistence and self-efficacy. The review concludes that targeted training, collaborative partnerships, and institutional investment are essential for enhancing grant success.

Contribution/Significance

This study contributes to the growing body of research on capacity building and equity in higher education by identifying actionable strategies that strengthen institutional readiness and competitiveness in federal grant processes.

Broader Impacts

By equipping MSIs with evidence-based approaches to grant development, this research supports inclusive growth within the federal funding landscape. Strengthening grant capacity at underrepresented institutions promotes educational equity, diversifies research participation, and advances sustainable innovation in special education and related services.

71 - Eduardo Mendoza Montoya, "Ninety Minutes of Peace: National Football Match Days and Crime in Colombia"

National football matches in Colombia attract widespread attention and consistently achieve record-breaking television viewership, temporarily reshaping daily routines across the country. While large sporting events are often associated with changes in social behavior, limited research has examined whether nationally shared sporting events influence short-term crime patterns in Latin American contexts. This study investigates whether crime in Colombia differs on days when the Colombian national football team plays official matches compared to similar days when no match was played, with two main objectives. First, to assess whether match days are associated with measurable changes in national crime levels and if these differ across crime types, including homicide, theft, assault, and domestic violence. Second, to explore whether the geographic distribution of crime across Colombian municipalities differs between match days and non-match days. The study employs a quasi-experimental event-day design using daily national crime data from 2014 to 2025, comparing match days to comparable non-match days within the same period to evaluate short-term changes in crime patterns. Separate analyses are conducted for each crime category, and municipal-level hotspot analysis is used to examine whether the spatial concentration of crime shifts on match days. The results offer important insights into short-term crime dynamics associated with nationally shared events and contribute to understanding how collective attention and routine disruption influence crime patterns. Furthermore, the findings highlight potential spatial shifts in crime concentration, offering evidence that may inform public safety planning and policing strategies during high-attention national events.

73 - Ekaterina Oparina, "A Structural Equation Modeling Pathway Based on the COM-B Model for Understanding the Factors Influencing Green Exercise"

Green exercise (i.e., physical activity conducted in natural environments) yields physical and psychosocial benefits, yet sustained participation remains poorly understood. This study applied the Capability, Opportunity, Motivation, Behavior (COM-B) framework to test direct and indirect pathways predicting green exercise volume using structural equation modeling (SEM). Adults who regularly engaged in green exercise (N = 332; 57.5% female; M age = 34.6, SD = 12.8) completed an online survey assessing Capability (perceived fitness, perceived physical ability, exercise self-efficacy), Opportunity (index of neighborhood walkability, perceived access to green space, social support from family and friends, and group cohesion when applicable), Motivation (autonomous motivation, enjoyment, habit strength, and exercise health beliefs), and outdoor physical activity (IPAQ-SF MET-min/week). Models were estimated with robust maximum likelihood and full information maximum likelihood, controlling for age, gender, race/ethnicity, and socioeconomic status. The two-factor measurement model for Capability and Motivation fit acceptably to well, $\chi^2(13) = 34.34$, CFI = .96, TLI = .94, RMSEA = .07, SRMR = .04. The hypothesized structural model demonstrated mixed fit, $\chi^2(73) = 188.83$, CFI = .83, TLI = .79, RMSEA = .069, SRMR = .061. Capability strongly predicted Motivation ($\beta = .74$, $p < .001$) and showed a significant direct association with green exercise volume ($\beta = .29$, $p = .04$). Opportunity did not significantly predict Motivation ($\beta = .08$, $p = .16$) or green exercise volume ($\beta = .06$, $p = .34$). Motivation was not associated with green exercise volume ($\beta = -.02$, $p = .90$), and indirect effects via Motivation were non-significant. Findings suggest that among regular green exercisers, capability-related resources (fitness and self-efficacy) may be more proximal determinants of weekly outdoor activity volume than opportunity conditions or motivational quality when modeled simultaneously. Results inform public health and parks-based programming by highlighting capability-building (e.g., mastery-based skill/fitness progression, confidence and barrier-management supports) as a promising lever to increase outdoor activity dose, with future longitudinal work needed to test causal pathways and maintenance outcomes.

76 - Mia Rodriguez, “Nurses Running the Glass Maze: Returning to Work After a Disability”

Today’s nursing staff are experiencing even greater shortages in the years following COVID-19, necessitating the reliance on expensive agency staffing to ensure hospital operations and to provide care for the communities they serve. However, these practices offer only superficial relief and cannot be sustained over the long term, prompting the need to reassess strategy. Fortunately, there is a talented group of qualified personnel—nurses with disabilities (NWD). These nurses are generally an underutilized talent pool and can help offset the many staffing challenges hospitals are currently facing if given clearer insight into the return-to-work (RTW) processes. To make the most of our available resources, we must understand the barriers and facilitators that nurses face after acquiring a disability during their careers. Using 15 semi-structured interviews and reflexive thematic analysis, we describe the ‘glass maze’ experienced by NWD from diverse clinical backgrounds when returning to work. All insights were informed by a phenomenological approach, with interviews transcribed verbatim. The glass maze is characterized by identity re-stitching, disability deficit framing, and leveraging disability as an asset. In line with this characterization, participants described a process of rediscovering the self, with many questioning their identity as a nurse after acquiring their disability. Others articulated the need to hide disability symptoms for fear of losing work, given that they no longer fit the idealized “healthy nurse” standard. Yet there were also those enlightened by their circumstances, who viewed it as a means to connect with the very people they serve. These nurses expressed greater empathy and understanding for the patients they care for following the onset of their disability, giving a perspective not typically afforded to their non-disabled counterparts. Therefore, to foster greater retention among NWD, designing RTW interventions that reduce disability deficit framing and teach the value of disability within the nursing profession is a necessary step. By acknowledging the lived experiences of NWD as a strength, rather than a weakness, we may achieve workforce stability and retain valuable talent for this vital profession.

77 - Karinna Rodriguez, "Using pupillometry to assess cognitive effort in children's mental rotation tasks"

Mental rotation is used to solve a range of problems, from puzzles to pulley systems, and is crucial for success in various Science, Technology, Engineering and Math (STEM) fields. Children's (and adults') mental rotation tasks typically present images rotated at varying angular disparities (e.g., 30°, 90°, 120°), with accuracy decreasing as rotation angle increases (Fernández-Méndez et al., 2020). Differences in performance are thought to reflect variation in cognitive effort. Using pupillometry, a psychophysiological measure shown to be sensitive to cognitive effort in adults (Saeedpour-Parizi et al., 2020), we tested whether children show changes in pupil diameter consistent with varying cognitive demands during a mental rotation task. Pupil diameter was recorded using eye-tracking technology in 161 children aged 3 to 7 years as they completed ten mental rotation trials featuring rotations of 30°, 90°, or 120°. A generalized additive mixed model was used to characterize non-linear changes in pupil diameter across each trial's duration. Across all conditions, pupil diameter fluctuated dynamically over time, suggesting active engagement and time-varying cognitive effort. Multiple comparisons with false discovery rate corrections revealed that trials involving 120° rotations elicited smaller changes in pupil diameter and distinct temporal patterns between 1000 – 2000 ms compared to 30° and 90° trials. Together, these findings suggest that pupillometry can capture nuanced temporal patterns associated with cognitive effort during spatial reasoning in early childhood, contributing deeper understanding of how children engage with mental rotation tasks.

78 - Mayte Rodriguez, “Factors Associated with Accessing Mental Health Services for Latino Children with Depression”

Background: Depression is a growing public health concern among children and adolescents with limited research focused on Latinos. Despite the high prevalence of depression among Latino children, many do not access mental health services. Using the framework from Johnson & Possemato (2019), this study aims to identify barriers to accessing mental health services for children with depression using data from Latino parents.

Methods: We used cross-sectional data from 65 Latino parents. Recruitment was conducted using BuildClinical, a recruitment agency, that advertised the study via search engines (e.g. google, bing) and social media (e.g. Instagram, Facebook, and Instagram). Whether parents reported seeking professional help for their children was measured as a dichotomous variable (Yes/No). Depression for children was assessed using the Revised Child Anxiety and Depression Scale-Parent Version (RCADS-P-47). Data was collected using an online survey. The survey included questions on depression stigma levels, depression literacy, attitude towards help seeking behaviors, and sociodemographic. Previously validated scales were used when possible. Descriptive (frequency and percentage) and bivariate (Crude Odds Ratio) analysis were conducted using SAS 9.4 software. This study was reviewed by the Florida International University Institutional Review Board.

Results: Of 65 parents, 22 reported symptoms for their child that met the criteria of clinical or borderline depression. Among the children who met the criteria, 81% of parents accessed mental health services. Lower rates of mental health seeking behavior were found among parents with children aged 5-9 years (50%) compared to those ages 10-18 (81.4%). Bivariate analysis showed depression literacy (cOR= 0.283, 95% CI: 0.092-0.873, p-value=0.02) and attitude towards help seeking (cOR=0.503, 95% CI: 0.163-1.554, p-value= 0.02) to be significant barriers for Latino parents when accessing mental health services for their children experiencing symptoms of depression. Surprisingly, no significant association was found among depression stigma levels and help seeking behaviors.

Conclusion: Overall, findings from the study suggest creating tailored interventions to address depression literacy and attitude towards seeking mental health services. Possible interventions include collaborations with primary physicians and school settings as current studies suggest can help increase knowledge of depression and therefore help seeking behaviors.

79 - Tamara Rubiera Pebe, "Big Five Personality Traits as Predictors of Neurodivergence Disclosure"

Neurodivergent individuals face challenging decisions regarding workplace disclosure and accommodation requests. Despite increased attention paid to the topic in recent literature, and neurodivergence affecting around 20% of the population, few individuals have disclosed neurodivergence in the working population. Disclosure and accommodation-requesting behaviors facilitate access to support at work, but are associated with high levels of perceived risk, including stigma and potential negative career consequences. We examine whether personality traits predict intent to disclose neurodivergence and intent to request accommodations during the job application process among neurodivergent individuals. Participants were university students (n = 430) who completed a personality measure and responded to two questions: When you apply for your next job, will you 1) request accommodations during the application process? and 2) request accommodations... during the application process? Results suggested that personality traits do not predict neurodivergent individuals' disclosure and accommodation request behaviors, but Conscientiousness and Openness predict unwillingness to do so in future job application processes, though effects were small. The findings suggest that personality differences do not strongly influence the disclosure decision, illustrating that personality-based explanations are unlikely to explain neurodivergence disclosure and accommodation-request behaviors. These findings discourage assumptions that individual differences contribute to disclosure decisions, emphasizing that contextual predictors may play a role. Organizations should prioritize psychological safety and inclusion signaling in application design.

80 - Ashfaq Ali Shafin, "Duplicating Deceit: Inauthentic Behavior Among Indian Misinformation Duplicators on X/Twitter"

Problem Statement. Social media platforms have become vectors for coordinated misinformation campaigns that exploit content duplication to amplify false narratives and manipulate public opinion. While conventional wisdom attributes such campaigns primarily to automated bots, the actual nature and behavior of accounts engaged in systematic misinformation dissemination remains poorly understood. This knowledge gap hinders effective fact-checking prioritization and platform moderation efforts.

Research Objectives. This study investigates inauthentic duplication behaviors on X/Twitter to: (1) characterize accounts that duplicate misinformation; (2) identify coordinated manipulation patterns; (3) evaluate whether past duplication behavior predicts future inauthentic activity; and (4) develop methods to detect emerging misinformation campaigns before they achieve widespread circulation.

Research Methodology. We analyzed 5,493 accounts that duplicated misinformation verified by AltNews, India's leading fact-checking organization, collecting over 12 million posts. We developed TweeXster, a novel framework employing Sentence-BERT embeddings and DBSCAN clustering to identify near-duplicate content clusters. Using BotometerX for automation detection, Louvain community detection for coordination analysis, and Google's Perspective API for toxicity assessment, we mapped coordinated inauthentic behavior.

Results and Conclusions. Contrary to prevailing assumptions, fewer than 1% of misinformation duplicators exhibited bot-like behavior; the vast majority were human-operated accounts. TweeXster identified 172,589 duplication clusters containing 514,958 tweets from 4,938 accounts, with 3,357 clusters having more than 10 duplicates. We detected 53 previously unreported misinformation campaigns garnering 128,658 likes and 65,998 retweets. Analysis revealed over 10,000 toxic content clusters, including 5,391 insult clusters and 4,226 identity attack clusters. We identified 4,249 clusters linking to specious news websites, with 41,421 total tweets promoting fabricated sources. Community detection uncovered 1,366 "super-duplicator" accounts organized into 62 politically-aligned communities (modularity=0.74).

Contribution and Significance. TweeXster outperforms traditional methods, detecting 12× more duplicate tweets and 5× more account pairs. Our findings challenge bot-centric models of misinformation spread, demonstrating human-operated networks drive coordinated deception. Past duplication behavior strongly predicts future inauthentic activity.

Broader Impacts. This research provides actionable insights for fact-checkers, platform moderators, and policymakers combating coordinated misinformation. By identifying high-risk accounts and emerging campaigns early, our approach enhances content moderation efficiency and protects vulnerable populations from targeted manipulation during elections and public health crises.

81 - Ananda Squire, “Conflicting Rationales: The Role of Institutional Logics in Collaboration for Housing Resilience”

Housing resilience broadly refers to the ability of a community’s housing systems to anticipate, absorb, recover from, and adapt to slow (e.g., sea level rise) and rapid onset (e.g., hurricanes) disasters. There is a growing interdisciplinary literature on housing resilience which highlights the importance of collaboration across diverse sectors, including the public, private, non-profit sectors and academia. However, our understanding of the factors that enable or hinder such collaboration remains limited. Focusing on this gap in the literature, this study examines the role of institutional logics—that is, belief systems, norms and values that shape how organizations decide and act within the broader system (e.g., market, communities)—in multi-sector collaboration in housing resilience. The study is based on semi-structured interviews (n=50) conducted with representatives across diverse sectors as part of a National Science Foundation funded study on housing resilience in Miami. The findings show that while the institutional logics in the public, private and non-profit sectors hinder collaboration in housing resilience, the professional logic in the academic sector (prioritization of professional competence) is more conducive to multi-sectoral collaboration. The institutional logics that hinder collaboration include: (1) a dominant market logic (e.g., Miami as a global capitalist hub) which contributes to leadership deficits and resistance to influence within the public sector, and to disengagement in the private sector due to insufficient incentives; and, (2) an ideal state logic (i.e., public service informed by meaningful participation) in the nonprofit sector that fosters distrust toward policy makers (and private sector actors). Therefore, the findings demonstrate that our ability to overcome logic-driven barriers will depend on efforts to strengthen academia's position as a neutral convener between stakeholders. Furthermore, policy interventions must consider and incorporate strategies to bridge the trust gaps across sectors and create stronger incentives for private sector engagement. Ultimately, these efforts will require better collaborative leadership capacities in local government.

82 - Demilade Vincent, "Opioid Misuse Among Older Adults with Chronic Pain: Risk Factors, Clinical Challenges, and Prevention Strategies"

Chronic pain affects nearly half of adults aged 65 and older and is frequently managed with opioid medications. While opioids may provide short-term relief, prolonged use increases the risk of misuse, dependence, adverse drug events, and overdose in older populations. Age-related physiological changes, polypharmacy, cognitive impairment, and comorbid mental health conditions further complicate safe opioid prescribing. This study examines patterns and predictors of opioid misuse among older adults with chronic non-cancer pain and evaluates clinical factors associated with increased vulnerability.

A retrospective analysis was conducted using electronic health record data from adults aged 65 years and older receiving long-term opioid therapy for chronic pain. Variables included opioid dosage (morphine milligram equivalents), duration of therapy, co-prescribed sedatives, documented pain severity, mental health diagnoses, and healthcare utilization patterns. Multivariate logistic regression was used to identify factors associated with opioid misuse, defined by early refill requests, dose escalation without provider authorization, or documented misuse behaviors.

Preliminary findings indicate that higher daily opioid dosages, concurrent benzodiazepine use, history of depression or anxiety, and social isolation were significantly associated with increased risk of misuse. Additionally, patients with multiple prescribers demonstrated higher rates of adverse outcomes. These findings highlight the multifactorial nature of opioid-related risks in aging populations.

This study contributes to ongoing efforts to optimize pain management strategies in geriatric care by identifying modifiable clinical and psychosocial risk factors. The results underscore the importance of individualized treatment plans, routine medication reviews, screening for mental health conditions, and integration of non-opioid and non-pharmacologic pain interventions. Broader impacts include informing prescribing guidelines, improving interdisciplinary pain management models, and reducing opioid-related harm among older adults while maintaining compassionate care for chronic pain.

83 - Brandy Whitford, "Governing AI Safety and Surveillance Systems in Immersive Service Environments"

Artificial intelligence (AI) systems are increasingly used in immersive service environments such as hospitality venues, large-scale events, and experiential spaces, for real-time surveillance, crowd monitoring, and safety decision-making. While these systems improve operational responsiveness, they shift consequential safety decisions from human judgment to algorithmic processes. In dense public environments, inadequate governance of AI systems risks undermining employee trust, perceptions of procedural fairness, and institutional legitimacy.

This research examines how AI-enabled safety and surveillance systems influence employee trust and perceptions of procedural justice in immersive service settings. Grounded in sociotechnical systems theory and organizational justice research, the project develops a governance-centered conceptual model that identifies structural mechanisms that shape trust formation. Specifically, it evaluates the roles of algorithmic transparency, human-in-the-loop oversight, and formal review mechanisms in moderating employee responses to AI-mediated decisions.

A structured interdisciplinary literature review synthesizes research across AI governance, organizational psychology, service management, and algorithmic accountability. The analysis demonstrates that trust outcomes are not determined by surveillance technology itself, but by how AI systems are embedded within accountable governance frameworks.

Findings indicate that immersive environments integrating meaningful human oversight and transparent decision criteria are more likely to sustain perceptions of fairness and legitimacy. In contrast, opaque or fully automated systems heighten perceptions of procedural injustice and resistance. In safety-sensitive public settings, governance failures may lead to workforce distrust, reputational harm, and diminished public confidence. This study contributes a governance-focused framework for responsible AI implementation in immersive service environments and establishes a foundation for future empirical research in hospitality and event-based contexts.