Idaho State University

Research & Creative Works

SYMPOSIUM

March 19, 2025 | Event Program

Idaho State University's Land Acknowledgment Statement

Acknowledging Native lands is an important way to honor and respect Indigenous peoples and their traditional territories. The land on which Idaho State University’s Pocatello campus sits is within the original Fort Hall Reservation boundaries and is the traditional and ancestral home of the Shoshone and Bannock peoples. We acknowledge the Fort Hall Shoshone and Bannock peoples, their elders past and present, their future generations, and all Indigenous peoples, including those upon whose land the University is located. We offer gratitude for the land itself and the original caretakers of it.

As a public research university, it is our ongoing commitment and responsibility to teach accurate histories of the regional Indigenous people and of our institutional relationship with them. It is our commitment to the Shoshone-Bannock Tribes and to ISU’s citizens that we will collaborate on future educational discourse and activities in our communities.

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Letter from the Vice President for Research and Economic Development

Martin Blair, Ph.D.

Vice President for Research
and Economic Development

ISU Student Research Colleagues,

You have accomplished much, learned much, and now contribute much to our common understanding of the world around us. Engaging in thoughtful discovery and imaginative creative works changes us in meaningful ways. The mental work you have done invites us to think more critically about how and why things function the way they do. It may even change our minds or encourage us to feel something we haven't experienced before. Thank you for sharing the results of your work--for putting yourselves "out there." I understand where you are coming from. Not too many years ago I was a new researcher sharing what I was learning. What you share today may be the beginning of an intellectual journey that will keep you exploring for decades to come. So, keep learning, keep growing, keep innovating, and keep sharing!

Keynote Speaker

Victoria L. Scharp, Ph.D.

Associate Professor

Department of Communication Sciences & Disorders

Victoria (Tori) Scharp, PhD, CCC-SLP is an Associate Professor in the Department of Communication Sciences and Disorders and Program Director for the PhD in Rehabilitation and Health Sciences at Idaho State University. She earned her PhD from the University of Pittsburgh and brings over 20 years of clinical experience to her scholarship and teaching. She directs the Scharp Language and Brain Lab at ISU's Pocatello campus and co-founded the Mountain West Aphasia Research Collective.

Dr. Scharp's research examines patient outcomes in intensive aphasia rehabilitation, focusing on discourse-level variables, student training, patient satisfaction, and family care partner perspectives. She co-leads an international working group on Intensive Comprehensive Aphasia Programs and was guest editor for a 2024 Aphasiology special issue. Her research has earned recent recognition, including a Rocky Mountain Research Evaluation and Commercialization Hub (RMT-REACH) Pilot Award and two ISU internal grants in 2024.

Committed to teaching excellence, Dr. Scharp has received multiple awards, including ISU Master Teacher, the College of Health Innovative Teacher Award, and the inaugural College of Health Teaching Fellowship. She holds a Quality Matters Teaching Online Certificate, serves on the Program for Instructional Effectiveness Steering Committee, and has a graduate course that is externally peer-reviewed and Quality Matters certified.

Dr. Scharp actively contributes to her field and academic community, holding an elected position on ISU's Research Council and she recently completed a term on the executive board of the Academy of Neurologic Communication Disorders and Sciences.

Pocatello Campus Agenda

Wednesday, March 19, 2025

Pond Student Union Building

1:00 - 3:00 p.m.	**Graduate Oral Presentations**	SUB - Upstairs Rooms & Little Wood
1:00 - 2:00 p.m.	**Undergraduate, Doctor of Pharmacy and Health Resident Poster Session A**	SUB - Ballroom
2:00 - 3:00 p.m.	**Undergraduate, Doctor of Pharmacy and Health Resident Poster Session B**	SUB - Ballroom
3:00 - 5:00 p.m.	**Graduate Poster Session**	SUB - Ballroom
3:00 - 5:00 p.m.	**Creative Works and Refreshments**	SUB - Wood River
3:15 - 4:45 p.m.	**Undergraduate, Doctor of Pharmacy and Health Resident Oral Presentations**	SUB - Upstairs Rooms & Little Wood
4:30 - 5:30 p.m.	**Celebrate Bengal Giving Day**	SUB - Quad Lounge
5:30 - 6:15 p.m.	**Keynote Speaker** **Dr. Victoria L. Scharp, Professor** *Department of Communication Sciences & Disorders*	SUB - Ballroom
6:15 p.m.	**Awards & Reception**	SUB - Ballroom YouTube Live

Meridian Campus Agenda

Wednesday, March 19, 2025

Sam and Aline Skaggs Health Science Center

1:00 - 4:45 p.m.	**Oral Presentations**	Rooms 687/817/818
3:30 - 4:45 p.m.	**Poster Presentations**	Main Foyer
5:30 - 6:45 p.m.	**Welcome, Keynote, & Awards via YouTube Live**	Room 687

Please note: Zoom links for oral and poster presentations can be found on the Symposium Website.

Oral Presentations

Graduate Oral Presentations

**Please note that only the Primary Presenter and up-to two Co-Presenters are listed. All Co-Authors are included with the abstracts.*

Biological & Natural Sciences

SUB Clearwater Room and Meridian 687

The confluence of social behavior, genitalia morphogenesis, and hormonal profiles during male to female sex change in the bluebanded goby, Lythrypnus dalli
Mackenzie Reed

Effects of Soil Amendments Targeting Roadside Revegetation on Soil Chemistry and Microbial Diversity in South-Eastern Idaho
Eric Christen

Advancing Aminoglycoside-Induced Ototoxicity Prevention with Zebrafish: A High-Throughput Screening Approach
Elizabeth Kara

Positive Allosteric Modulators (PAMS) of $\alpha 9\alpha 10$ nicotinic acetylcholine receptors (nAChRs) for the treatment of hidden hearing loss
Pooja Sapkota

Dispersal of Dormant Bacteria in Deep-Sea Sediments
Rhys Ellis

Recolonization and movement limit deep divergence patterns among Rainbow Trout populations
Tyler Breech (Zoom)

Characterizing the effect of a prescribed fire on Phosphorus and sediment biogeochemistry in a montane intermittent stream system
Jennings Leavell

Business, Economics & Public Administration
Engineering, Physical & Mathematical Sciences

SUB Little Wood Room

AI-Enhanced Credit Memo Evaluation for Financial Decision-Making
Callie Huber

Economic Trends & Cyber Operations (2019–2024)
Skyler Moa

A Case Study in Cybersecurity Policy of Self-training LLMs via RAG Dataset Production
Drew Perry

Feedback-Seeking in Remote Work: How Leaders Stay in Touch without Being in Touch
Rehnaz Karinjia

Advanced Deep Learning Framework for Automated Segmentation and Quantification of Vascular Bundles in Corn Stalk µ-CT Images
Antora Dev

Assessing Security Risks in Software Dependencies: A Quantitative Study of the Maven Ecosystem
Costain Nachuma and Md Mosharak Hossan

Oh Zaddy: Erotic Attachments to Right Wing Personal Brands
Weston Sprackles

Leveraging Artificial Intelligence to Enhance Functionality of Electronic Health Records
Susana Agudelo

From Discovery to Fix: The Journey of Software Vulnerabilities
Md Fazle Rabbi

Education, Learning & Training
Health, Nutrition & Clinical Sciences
Humanities, Behavioral & Social Sciences

SUB North Fork Room and Meridian 818

The Impact of Self-Care Education on Undergraduate Well-Being, Happiness, Flourishing, and Academic Burnout
Eliana Claps

Shaping Mathematical Identity: How Reasoning-Based Discourse Empowers Student Mathematicians
Mick Morgan

See, Learn, Act: Visual Cues in Learning to Detect Phishing Attempts
Arifa Islam Champa

Proposing Metrics for a Unique Model of DHH Family Engagement
Marie Martinez (Zoom)

Deafness and Autism
Emily Fitterer (Zoom)

Pediatric Hearing Healthcare Roadmap
Blair Richlin (Zoom)

Health, Nutrition & Clinical Sciences

SUB Middle Fork Room and Meridian 817

Idaho Public School's Healthcare Team and Healthcare Facility Availability: An Observational Cross-Sectional Study
Amy Hunt

Characterizing a new therapeutic strategy for the treatment of necrotizing soft tissue infections caused by group A streptococcus
Anyauba Nmaju

CPR and AED Availability in Public Schools in a Pacific Northwest State
Indianna Berg and Amy Hunt

Caregivers' Perspectives on Communication Modality Counseling for Children with Hearing Differences
Whitney Miller

Eastern Idaho State Fair Public Safety Improvement Project
Dallen Farmer

A Systematic Review of Phonological Awareness Interventions for Children who are Deaf and Hard of Hearing: A Guide for Clinicians
Bridget Fitzpatrick

Towards Selective Inhibition of Cyclin Dependent Kinase 11 for Cancer Therapy
Janhabee Shrestha

Identifying and Improving Access to Care for Veterans: A Quality Improvement Project
Virginia Holmgren

Components of the Renin Angiotensin System as Potential Biomarkers of Breast Cancer
Biwash Ghimire

Humanities, Behavioral & Social Sciences

SUB South Fork Room

Medieval Milk
Kierra Burns

Nigerian English: Deviation or Variation?
Taiwo Salako

How Hong Kong has affected British and Chinese Relations
Jacob Hall

The Influence of Therapist Recreational Alcohol Use on Client Perceptions of Therapeutic Alliance: A Survey Study
Katelyn Cathcart

Cybersecurity Awareness and Scams in the Elderly
Joshua Lindquist

Learning as Liberation: Resisting Religious Colonialism Through Education
Mahnaz Pooshahidi

Shaping Climate Discourse: A Comparative Study of Media Narratives Across National Contexts
Sadman Sakib

Predicting Health Behaviors using Posttraumatic Stress Disorder Symptom Clusters
Emme Tucker

Recovery in Motion: Neuroplasticity and Spinal Cord Injury
Alleyna Martes and Leticia Herrera

Does Caffeine Improve Your Reading Comprehension and How Well You Evaluate Your Performance?
Abigael Ntwal Mukaz, Jessica Chiapa, and Jeremy Russel

Undergraduate, Doctor of Pharmacy and Health Resident Oral Presentations

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Biological & Natural Sciences
Humanities, Behavioral & Social Sciences

SUB Little Wood Room

The Third-Person Effect and Education During COVID
Ashley Helm

International Collaborations in Psychotherapy Research
Ericka Christensen

Results of an Extensive Surface-Scanning Project of Idaho's Cretaceous Fossil Record
Miriam Fridel

Now Hear This! Impacts of Media Representation on Deaf Political Engagement and Social Acceptance
Chelsea Blanchard

Luchadoras por dentro y por fuera: Fighters Within and Without
Cristal Castillo

Business, Economics & Public Administration
Engineering, Physical & Mathematical Sciences

SUB North Fork Room and Meridian 818

Need and Interest in Personal Finance Elective in ISU Student Pharmacists
Rachel Ray

Immersive Analytics: Human-Machine Hybrid Approach with Virtual Reality for Detecting Outliers
Hyrum Redd

Crack detection of building infrastructure using AI applications
Pramesh Shah

Novel Light Absorbing Semiconductor Materials with Multinary Copper Chalcogenides
Prem Shah

Education, Learning & Training
Health, Nutrition & Clinical Sciences

SUB Middle Fork Room and Meridian 817

Vertical Ground Reaction Forces Experienced During Various Foot Strike Patterns
Victor Sklenka

Vaccine Education in K-12 Teachers and Staff
Clayton Salmon and Skyler Messick

Unlocking the Neurochemical Secrets of Aging: Investigating the Impact of GABA Producing Probiotics on Healthy Aging
Sanaly Nava

Reducing Vaccine Hesitancy in College-Aged Students
Victoria Pham

Redux: An Interactive, Dynamic Knowledge Base for Teaching NP-completeness
Andrija Seval

Creative Works Presentations

SUB Wood River Room

The Artist Mother Tension: The Days are Long and The Years are Short
Jihae Jang, graduate student

Etch the Soul
Jared Anderson, undergraduate student

Mental Health and Athletes
Zoe Dejardin, undergraduate student

Feeding the Crown when the Root no Longer Can: Childhood Memory Loss and Adult Identity
Ila Garrido, undergraduate student

Building a Geiger Counter
Parker Johnson and Cesar Garcia, undergraduate students

Trans Bodies
Soul King, undergraduate student

Painting of the Pleistocene Epoch
Riley Ortiz, undergraduate student

Poster Session Presentations

Graduate Poster Session

**Please note that only the Primary Presenter and up-to two Co-Presenters are listed. All Co-Authors are included with the abstracts. The Zoom link for remote poster presentations can be found on the Symposium Website. MC = Meridian Campus Poster.*

Biological & Natural Sciences

Zoom **Recolonization and movement limit deep divergence patterns among Rainbow Trout populations**
Tyler Breech

#5 **Dispersal of Dormant Bacteria in Deep-Sea Sediments**
Rhys Ellis

#42 **Investigating the effect of aging in adrenergic receptors in pancreatic islets**
Daniela Francia

#41 **Arachidonic Acid Pathway and Its Metabolites: Biomarkers for Breast Cancer?**
Pradeep Giri and Sina Dehestani

#28 **Microbial and Botanical Fingerprints of Human-Induced Ecological Change**
Rebecca Hazard

#17 **Playing for Both Teams: Molecular Mechanisms of Sex Change in the Bluebanded Goby**
Anthony Hinders

#1 **Positive Allosteric Modulators (PAMS) of α9α10 nicotinic acetylcholine receptors (nAChRs) for the treatment of hidden hearing loss**
Pooja Sapkota

#38 **Mountain spring controls on stream water quality and quantity in the non-perennial Gibson Jack watershed in southeastern Idaho**
Anna Sniadach

MC **Rodent Versus Zebrafish: Translatability of the Larval Zebrafish Lateral Line Neuromast Model as A High-Throughput Screening (HTS) Method for Noise-Induced Hearing Loss Drug Discovery**
Jiemin Yuan

Business, Economics & Public Administration

#9 **Leveraging Artificial Intelligence to Enhance Functionality of Electronic Health Records**
Susana Agudelo

#13 **Feedback-Seeking in Remote Work: How Leaders Stay in Touch Without Being in Touch**
Rehnaz Karanjia

#2 **Oh Zaddy: Erotic Attachments to Right Wing Personal Brands**
Weston Spraktes

Education, Learning & Training

#12 **Applying sports coaching standards in family-centered early intervention**
Ashley Ben Jacob

#15 **See, Learn, Act: Visual Cues in Learning to Detect Phishing Attempts**
Arifa Islam Champa

#34 **Transformational Leadership for Effective Injury Prevention Protocols**
Serenity Crabb

Zoom **Deafness and Autism**
Emily Fitterer

#27 **Practical Recommendations for Guided In-Class Practice of Visual Representations of Biological Phenomena**
Calista Gresick

Zoom **Improving Provider Knowledge of The Importance of Patient Education on Potential Mental Health Adverse Effects Associated with Hormonal Contraception**
Emilee Knapp

#3 **Exploring Different Text-Based Instruction Overlays in Video Games: Impact on Player Performance and Experience**
Rifat Ara Tasnim

Engineering, Physical & Mathematical Sciences

#16 **Advanced Deep Learning Framework for Automated Segmentation and Quantification of Vascular Bundles in Corn Stalk μ-CT Images**
Antora Dev

#33 **Laboratory Evaluation of Glass Fiber Reinforced Polymer (GFRP) Bars to Improve Joints in Natural Fiber Reinforced Concrete (NFRC) Pavements**
Saugat Dotel

#39 **Non-Destructive Detection of Hollow Heart in Potatoes Using Artificial Intelligence**
Nusrat Farheen

#23 **Assessing Security Risks in Software Dependencies: A Quantitative Study of the Maven Ecosystem**
Costain Nachuma and Md Mosharaf Hossan

#22 **Google Drive Storage Management**
Aney Paul

#44 **From Discovery to Fix: The Journey of Software Vulnerabilities**
Md Fazle Rabbi

#37 **Ultra-High-Performance Concrete for Compressed Air Energy Storage**
Greesh Vaidya

Health, Nutrition & Clinical Sciences

#21 **Factors influencing speech-in-noise performance**
Carley Church

#32 **Eastern Idaho State Fair Public Safety Improvement Project**
Dallen Farmer

MC **A Systematic Review of Phonological Awareness Interventions for Children who are Deaf and Hard of Hearing: A Guide for Clinicians**
Bridget Fitzpatrick

Zoom **Evaluating Intimate Partner Violence Awareness and Intervention in Rural Healthcare Settings: A DNP Project**
Amanda Froisland

#40 **Components of the Renin Angiotensin System as Potential Biomarkers of Breast Cancer**
Biwash Ghimire

MC **Provider Adherence to American Heart Association Cholesterol Guidelines**
Amber Mallet Wrout

#4 **Community Movie Screening: Assessing Advance Care Planning Readiness**
Jacob McMillin

MC **Caregivers' Perspectives on Communication Modality Counseling for Children with Hearing Differences**
Whitney Miller

MC **In silico Guided Modulation of Mechanotransduction Channels in Zebrafish**
Christopher Nicolet

#36 **Development of L-Ascorbic Acid Analogs as Biological Probes for Hearing Loss Therapy**
Jordan Oman

Zoom **Pediatric Hearing Healthcare Roadmap**
Blair Richlin

MC **Diagnosis Protocol for Treatment-Resistant Depression**
Kristina Welborn

Humanities, Behavioral & Social Sciences

#45 **A Content Analysis of Canine Therapy on Youth in Juvenile Detention Centers**
Ethan Bonham

#8 **Medieval Milk**
Kierra Burns

#35 **Child Marriage in India: Its Profound and Lasting Consequences**
Sarah May Clarkson

#18 **The Invisible Opponent: Mental Health Challenges in Student-Athletes**
Camryn Collman

#6 **Psychotherapy Stigma and its Origins: Mental Health Disorders, Treatment-Seeking, or Both?**
Angelina Conrow

#31 **Connected for a Better World: Human, Animal, and Environmental Welfare – Implications for Health Care Professionals**
RaeVonne Cox and Joseph Do

#19 **Effects of Opportunity Costs on Delay Discounting for Hypothetical Food and Money**
Andrew Harmon

#26 **Risks of Early Marijuana Engagement: The Potential Risks of Depression and Suicidality**
Hannah Lesnick

#24 **Building a Virtual Skeleton: Preservation of Human Skeletal Remains through Digitization at ISU**
Spencer Moore and Nyx Call

#11 **Delay discounting for sexual activity and money and their relationship to sexual risk behaviors in college students**
Kaylin Muller

#14 **Does Caffeine Improve Your Reading Comprehension and How Well You Evaluate Your Performance?**
Abigael Ntwal Mukaz, Jessica Chiapa, and Jeremy Russell

#29 **Modes of Communication During a Joint-Rhythm Task Modulate Cognitive Control Resources**
Juergen Riedelsheimer

#7 **Stone Testimonies: The Archaeology of LDS Symbolism in Mountain View Cemetery**
Rachel Sutherland and Spencer Moore

#25 **Gravestone Symbology and Resilience of the Greek Orthodox Community in Pocatello, Idaho**
Samantha Unwin, Jose Sanchez, and Elleah Wilding

#43 **The Power of Peer Interaction: How Group Therapy Shapes Social Communication**
Abigail West

Undergraduate, Doctor of Pharmacy and Health Resident Poster Session

**Please note that only the Primary Presenter and up-to two Co-Presenters are listed. All Co-Authors are included with the abstracts. MC = Meridian Campus Poster.*

Biological & Natural Sciences

#30A **TicTac's Totally Tubular Tail Protein: Bacteriophage Annotation Reveals "Fresh" Protein Functions for EK1 Cluster**
Megan Allgood

#32A **Rapid regulation of enzyme activity in male and female bluebanded gobies**
Ashley Cantin

#23A **Step-By-Step: Treadmill Stepping Behaviors Following Spinal Cord Injury**
Diana Cortez

#27A **Assessing the relationship between asbestos exposure and immune dysfunction in human subjects and mouse models**
Natalie Empey

#19A **Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS): A Powerful Analytical Tool for Diverse Applications**
Isabel Harbig

#20A **Magnesium Rescue of Streptococcus pneumoniae mntE Manganese-Sensitive Growth Defect**
Shannon Hendricks

#18A **Identification of the first fossil vertebrates described from Trinidad & Tobago: giant Ice Age armadillos (Chlamyphoridae: Glyptodontinae)**
Ferrania Huang

#26A **Biodegradation of Sulfur-Based Polymers Facilitated by Soil Bacteria**
Zachery McLane

#37A **Asbestos and autoimmune disease: Identifying the mouse lung citrullinome**
Larisa McOmber

#25A **Muscle Recruitment and Fatigue in the Biceps: An EMG Analysis**
Kyle Price, John Morrison, and Stephani Haun

#13A **Breast Dose and Lead Aprons**
Nicole Sacco, Jaycie Belnap, and Bobby Cunningham

#35A **Asbestos Induced Autoantibodies Inhibit the Effects of Plasminogen in Pleural Mesothelial Cells**
Darious Salas

#14A **Impact of Microplastics on Macrophage Toxicity and Phagocytic Activity**
Georgia York

Business, Economics & Public Administration

#24B **AI-Assisted Financial Insights on a Budget: A Comparative Study of Locally Hosted LLMs**
Matthew Alonzo

Education, Learning & Training

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Eliana CraigSmith

#22B **To What Extent do PSTs Understand the Validity of a Students' Mathematical Argument**
Tiffany Crotteau

#27B **Uncovering Students' Current Conceptual Understanding of a Topic Prior to Classroom Instruction**
Emma Grayson

#9B **Rural Secondary Teachers: The "Jack-of-All-Trades"**
Kailey Marler

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Maddie Nelson and Lillian Favor

Engineering, Physical & Mathematical Sciences

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#17B **Zeolite Catalyzed Friedel-Crafts Acylations**
Angela Hayden, Savanah Call, and Abbi Summerill

#19B **Improving Organism Identification in the Great Salt Lake: A Metagenomic Study of the Three Domains of Life in a Hypersaline Environment**
Kyla Johnston and Jeremy Hernandez

#30B **Reinforcement Learning for Upper-Extremity Trans-Radial Prosthesis Actuation**
Jaden Palmer, Kayson Oakey, and Christian Done

#12B **Novel Light Absorbing Semiconductor Materials with Multinary Copper Chalcogenides**
Prem Shah

#23B **Hydrolysis of Esters Using Zeolites as Acid Catalysts**
Mason Sistrunk and Amina Elora, and Greg Johnson

#6B **Materials Development for In-pile Peak Temperature Monitoring**
Adam Storms and Shanae Brachtl

#11B **Synthesis and comparison of zinc thiolate complexes as potential precursors for CZTS semiconductors.**
Mya Vanderpool

Health, Nutrition & Clinical Sciences

#11A **Community Pharmacists in Medication-Assisted Therapy for Opioid Use Disorder: Facilitating Positive Outcomes Through Prescribing, Patient Management, and Primary Care Referrals**
Mikayla Antonson and Duncan Andrus

#28A **The Regulatory Complexities of Forensic Psychiatry Across State Lines**
Jake Arbon

#29A **Scatter Radiation Blocked by Lead Glasses**
Jasmine Barajas, Makayla Searle, and Nate Nelson

#8A **Scatter Radiation in Fluoroscopy**
Marializ Barrera, Gabriela Garcia, and Mariela Castaneda

#36A **Utilizing Pharmacists to Improve Transitions of Care During Hospital and Emergency Department Follow-Up at a Federally Qualified Health Center**
Kristen Caldwell

#22A **Avoiding Dose Creep**
Alexandra Cook

#12A **'A Pill for Every Ill': Establishing a Pharmacist Led Comprehensive Medication Management Program at a Federally Qualified Health Care Center**
Mary Cutright

#33A **Bridging the Knowledge Gap: Enhancing Delirium Recognition and Prevention Through Staff Education**
Chaston Ellis

#15A **Meditation Group at a Women's Maximum Security Prison**
Leah Fortson

#16A **Importance of Wearing Lead during Portable Exams**
MaKell Furniss and Emily Mickelsen

#24A **Completion/Distribution Rate Improvement of Physician Orders for Scope of Treatment (POST) Forms Among Patients Over the Age of 65**
Landon Hillebrant

#7A **Inappropriate Use of Inhaled Corticosteroids (ICS) in Patients with Chronic Obstructive Pulmonary Disease (COPD)**
Harrison Hoskins

#21A **Medical, Psychiatric, and Sociodemographic Predictors of Clozapine Initiation at an Academic Medical Center**
Ryan Kelley

MC **Readability and Credibility of Online Patient-Directed Information about Opioid Addiction**
Sophia Kirsinas and Alexis Simpson

MC **Implementing Sustainable PRISM Model-Based Mobile Health Clinics**
Samuel McKnight

#9A **The Legal and Ethical Implications of Digital vs. Lead Markers: A Literature Review**
McKenna Nield

#31A **Injury Reporting and Care Satisfaction of Collegiate Dancers in the West**
Lauren Owens

#6A **Second Hand Observation Targeting Stress in Pediatrics (SHOTS-P)**
Colton Phippen, Cody Cunningham, and Sheldon Wernick

#34A **To Shield or Not to Shield: How effective is gonadal lead shielding in reducing scatter radiation dose to patients during x-ray procedures?**
Jessica Salisbury

#17A **'Holy Anorexia': Examining the Role of Religiosity as a Positive or Negative Factor for Eating Disorder Development Among Latine Women Within a Southeastern Idaho Education Institution**
Ingrid Sandoval Mendoza

#10A **Vertical Ground Reaction Forces Experienced During Various Foot Strike Patterns**
Victor Sklenka, Brandon Walker, and Kade Burch

Humanities, Behavioral & Social Sciences

#29B **Now Hear This! Impacts of Media Representation on Deaf Political Engagement and Social Acceptance**
Chelsea Blanchard

#20B **The Influence of Gender and Language Experience on Academic Confidence at ISU**
Vianney Blanco, Cristal Castillo, and Winter Konsella

#16B **Exploring the Link Between Parent and Child College Major Selection**
Haley Burke, Emma Standley, and Alyssa Harvey

#13B **Luchadoras por dentro y por fuera: Fighters Within and Without**
Cristal Castillo

#25B **Investigation of Undergraduate Attitudes towards the LGBTQ+ Community**
Jaden Davis

#8B **Sleep Duration and College Student's Productivity: A Correlational Study**
Ella Deasy and Chloe Roberts

#18B **Social Media Engagement and Productivity in College Students - A Correlational Study**
Kali Earl and Jazzy Hernandez

#21B **Stigmatization of Autism: Analyzing Caregiver Affiliate Stigmatization Experiences**
Ciara Gaches and Aubrey Fuchs

#26B **Private Mass Murder: How Specific Aspects Affect Familicide-Suicide Behavior Case Study**
Emma Hibler

#31B **The relationships between executive functions and social problems in school-age children**
Dexter Hoffman

#15B **Does Watching Bluey Encourage Adults to Seek Therapy?**
Arminda Horton

#32B **The Impact of Psychological Images: The Case of America's Two Parties**
Ethan Moss

#28B **Sensorimotor Reflexes in Adult Rats Following a Neonatal Spinal Cord Transection**
Aubrey Skinner

#10B **Religiosity related to Sex Education**
Taylor Stacey

2024 Research and Creative Works Symposium Award Recipients

Graduate Oral Presentation Award Recipients

Top Oral Presentation in Biological & Natural Sciences

Presented to

Christopher Nicolet

"Constructing the 3-Dimensional Structure of the Mechanoelectrical Transduction Channel"

Top Oral Presentation in Business, Economics & Public Administration

Presented to

Rian Binte Kamal

"Level of Triple Bottom Line Reporting Coverage: A Study on the Banking Industry of Bangladesh"

Top Oral Presentation in Education, Learning & Training

Presented to

Tingxuan Lu

"Integrating A Simulation Platform for ESL Teacher Candidates Training: A Case Study on Lesson Planning and Delivery"

Top Oral Presentation in Engineering, Physical & Mathematical Sciences

Presented to

Costain Nachuma

"Insights into the Use of ChatGPT in Programming"

Top Oral Presentation in Health, Nutrition & Clinical Sciences

Presented to

Blair Richlin

"Demographics Affecting Access to Hearing Technology: Insights from NHANES"

Top Oral Presentation in Humanities, Behavioral & Social Sciences

Presented to

Angelina Conrow

"Can AI Provide Quality Translation for Psychotherapy Research Measures?"

Undergraduate Oral Presentation Award Recipient

Top Oral Presentation in Humanities, Behavioral & Social Sciences

Presented to

Sydnee Thomas

"Empowering Patients: The Role of Early Hospice Discussions in Quality of Life"

Graduate Poster Presentation Award Recipients

Top Poster Presentation in Biological & Natural Sciences

Presented to

Makenzie Reed

"Dorsal fin raises as low intensity aggressive displays during hierarchy resolution in a sexually plastic fish"

Top Poster Presentation in Business, Economics & Public Administration

Presented to

Rian Binte Kamal

"Level of Triple Bottom Line Reporting Coverage: A Study on the Banking Industry of Bangladesh"

Top Poster Presentation in Education, Learning & Training

Presented to

Jessica Wooley

"A Mindful Pedagogical Approach to the Maternal in 20th-Century Postcolonial Fiction"

Top Poster Presentation in Engineering, Physical & Mathematical Sciences

Presented to

Daliedmarie Delgado Maisonet

"Surface morphometry as a control on micro-Ice Stability Regions (ISR)"

Top Poster Presentation in Health, Nutrition & Clinical Sciences

Presented to

Emily Harames

"Lights, Camera, Conversation! A Community Movie Day for Advance Care Planning Readiness"

Top Poster Presentation in Humanities, Behavioral & Social Sciences

Presented to

Morgan Musquez

"Effects of High-Sugar Diets on Delay Discounting for Food in Binge-Eating Prone and Binge-Eating Resistant Rats"

Undergraduate Poster Presentation Award Recipient

Top Poster Presentation in Biological & Natural Sciences

Presented to

Mya McHugh

“Hypermethylated in Cancer 2 (Hic2) manipulation affects Cranial Neural Crest gene expression in Xenopus laevis”

Creative Works Award Recipient

Presented to

Yidan Guo

“Women Who Are Asian Immigrants: The Seen and Unseen”

List of Student Presenters

**Please note that only the Primary Presenter and up-to two Co-Presenters are listed. All Co-Authors are included with the abstracts.*

College of Arts and Letters

Chelsea Blanchard (Communication, B.A.)
Vianney Blanco (Psychology, B.S.)
Haley Burke (Psychology, B.A.)
Kierra Burns (English, MA)
Cristal Castillo (Spanish, B.A.)
Katelyn Cathcart (Clinical Psychology, PhD)
Jessica Chiapa (Psychology, B.A.)
Ericka Christensen (Psychology, B.S.)
Eliana Claps (Clinical Psychology, PhD)
Sarah May Clarkson (Interdisciplinary, MA)
Angelina Conrow (Clinical Psychology, PhD)
Jaden Davis (Psychology, B.S.)
Ella Deasy (Psychology, B.S.)
Kali Earl (Psychology, B.S.)
Aubrey Fuchs (Psychology, B.S.)
Ciara Gaches (Psychology, B.S.)
Ila Garrido (Digital Media, B.F.A)
Jacob Hall (Political Science, MA)
Isabel Harbig (Psychology, B.S.)
Andrew Harmon (Experimental Psychology, PhD)
Alyssa Harvey (Psychology, B.A.)
Ashley Helm (Political Science, B.A.)
Jazzy Hernandez (Psychology, B.A.)
Leticia Herrera (Experimental Psychology, PhD)
Emma Hibler (Psychology, B.S.)
Dexter Hoffman (Psychology, B.S.)
Arminda Horton (English, BA)
Jihae Jang (Art, MFA)
Soul King (Art, B.F.A)
Winter Konsella (Social Work, B.A.)
Hannah Lesnick (Experimental Psychology, PhD)
Alleyna Martes (Experimental Psychology, PhD)
Spencer Moore (Anthropology, MS)
Ethan Moss (Psychology, B.S.)
Kaylin Muller (Clinical Psychology, PhD)
Abigael Ntwal Mukaz (Experimental Psychology, PhD)
Mahnaz Poorshahidi (English & Teaching of English, PhD)
Juergen Riedelsheimer (Psychology, MS)
Chloe Roberts (Psychology, B.A.)
Sadman Sakib (Communication, MA)
Taiwo Salako (English, MA)
Jose Sanchez (Anthropology, MS)

Aubrey Skinner (Psychology, B.S.)
Taylor Stacey (Psychology, B.A.)
Emma Standley (Psychology, B.A.)
Rachel Sutherland (Anthropology, MS)
Emme Tucker (Clinical Psychology, PhD)
Samantha Unwin (Anthropology, MS)
Elleah Wilding (Sociology, MA)

College of Science and Engineering

Megan Allgood (Biology, B.S.)
Jared Anderson (BS, Computer Science)
Shanae Brachtl (Biochemistry, B.S.)
Tyler Breech (Biology, PhD)
Nyx Call (Geology, B.S.)
Savanah Call (Chemistry, B.S.)
Arifa Islam Champa (Engineering & Applied Science, PhD)
Eric Christen (Microbiology, MS)
Eliana CraigSmith (Chemistry, B.S.)
Antora Dev (Engineering & Applied Science, PhD)
Christian Done (Mechanical Engineering, B.S.)
Saugat Dotel (Civil Engineering, MS)
Rhys Ellis (Microbiology, MS)
Amina Elora (Chemistry, MS)
Natalie Empey (Biochemistry, B.S.)
Nusrat Farheen (Engineering & Applied Science, PhD)
Daniela Francia (Biology, MS)
Miriam Fridel (Geology, B.S.)
Calista Gresick (Biology, DA)
Angela Hayden (Chemistry, B.S.)
Rebecca Hazard (Engineering & Applied Science, PhD)
Shannon Hendricks (Microbiology, B.S.)
Jeremy Hernandez (Biochemistry, B.S.)
Anthony Hinders (Biology, MS)
Md Mosharaf Hossan (Computer Science, MS)
Greg Johnson (Chemistry, B.S.)
Kyla Johnston (Biochemistry, B.S.)
Jennings Leavell (Geology, MS)
Zachery McLane (Biochemistry, B.S.)
Larisa McOmber (Biology, B.S.)
Costain Nachuma (Engineering & Applied Science, PhD)
Kayson Oakey (Mechanical Engineering, B.S.)
Riley Ortiz (HBS, Biochemistry, AA, University Studies)
Jaden Palmer (Mechanical Engineering, B.S.)
Aney Paul (Engineering & Applied Science, PhD)
Md Fazle Rabbi (Engineering & Applied Science, PhD)
Hyrum Redd (Mechanical Engineering, B.S.)
Makenzie Reed (Biology, PhD)
Jeremy Russell (Computer Science, BS)

Darious Salas (Biochemistry, B.S.)
Andrija Sevaljevic (Computer Science, B.S.)
Pramesh Shah (Computer Science, B.S.)
Prem Shah (Physics, B.S.)
Mason Sistrunk (Chemistry, B.S.)
Anna Sniadach (Geology, MS)
Adam Storms (Chemistry, B.S.)
Rifat Ara Tasnim (Engineering & Applied Science, PhD)
Greesh Vaidya (Civil Engineering, MS)
Mya Vanderpool (Chemistry, B.A.)
Georgia York (Microbiology, B.S.)

College of Business

Susana Agudelo (Business Administration, MBA)
Matthew Alonzo (Business, B.S.)
Cristal Castillo (Business, B.S.)
Callie Huber (Business Administration, MBA)
Rehnaz Karanjia (Business Administration, MBA)
Joshua Lindquist (Business Administration, MBA)
Skyler Moa (Business Administration, MBA)
Drew Perry (Business Administration, MBA)
Weston Spraktes (Business Administration, MBA)

College of Education

Kade Burch (Sport and Exercise Science, B.S.)
Serenity Crabb (Athletic Administration, MA)
Tiffany Crotteau (Elementary Education, B.A.)
Zoe Dejardin (Sport Management, B.A.)
Emily Fitterer (Deaf Education, MS)
Emma Grayson (Secondary Education, B.S.)
Kailey Marler (Secondary Education, B.A.)
Mick Morgan (Elementary Education, M.Ed)
Brandon Walker (Sport and Exercise Science, B.S.)
Victor Sklenka (Sport and Exercise Science, B.S.)

College of Technology

Tayen Brooks (Energy Systems Nuclear Operations Tech, Licensed Operator Concentration, A.A.S.)
Ryan Chapman (Energy Systems Nuclear Operations Tech, Licensed Operator Concentration, A.A.S.)
Cesar Garcia (Energy Systems Nuclear Operations Tech, Licensed Operator Concentration, A.A.S.)
Jonathan Garritson (Energy Systems Nuclear Operations Tech, Licensed Operator Concentration, A.A.S.)
Parker Johnson (Energy System Nuclear Operations Tech, AAS)

Kasiska Division of Health Sciences: College of Health

Jasmine Barajas (Radiographic Science, B.S.)
Marializ Barrera (Radiographic Science, B.S.)
Jaycie Belnap (Radiographic Science, B.S.)
Ashley Ben-Jacob (Rehabilitation & Health Sciences, PhD)
Indianna Berg (Athletic Training, MS)
Ethan Bonham (Counseling, Clinical Mental Health, M.Coun)
Ashley Cantin (Medical Lab Science, B.S.)
Mariela Castaneda (Radiographic Science, B.S.)
Carley Church (Audiology, AuD)
Camryn Collman (Counseling, Clinical Mental Health, M.Coun)
Alexandra Cook (Radiographic Science, B.S.)
Diana Cortez (Health Science, B.S.)
RaeVonne Cox (Counseling, Clinical Mental Health, M.Coun)
Bobby Cunningham (Radiographic Science, B.S.)
Joseph Do (Counseling, Marital/Couple/Family Counseling, M.Coun)
Dallen Farmer (Homeland Security and Emergency Management, MS)
Lillian Favor (Radiographic Science, B.S.)
Bridget Fitzpatrick (Speech-Language Pathology, MS)
Amanda Froisland (Nursing Practice -DNP)
MaKell Furniss (Radiographic Science, B.S.)
Gabriela Garcia (Radiographic Science, B.S.)
Stephani Haun (Physician Assistant Studies, MA)
Virginia Holmgren (Nursing Practice -DNP)
Ferrania Huang (Medical Lab Science, B.S.)
Amy Hunt (Athletic Training, MS)
Emilee Knapp (Nursing Practice -DNP)
Amber Mallet Wrout (Nursing Practice, DNP)
Marie Martinez (Rehabilitation & Health Sciences, PhD)
Jacob McMillin (Nursing Practice, DNP)
Emily Mickelsen (Radiographic Science, B.S.)
Whitney Miller (Audiology, AuD)
John Morrison (Health Science, B.S.)
Sanaly Nava (Health Science, B.S.)
Maddie Nelson (Radiographic Science, B.S.)
Nate Nelson (Radiographic Science, B.S.)
McKenna Nield (Radiographic Science, B.S.)
Lauren Owens (Health Science, B.S.)
Kyle Price (Health Science, B.S.)
Blair Richlin (Rehabilitation & Health Sciences, PhD)
Nicole Sacco (Radiographic Science, B.S.)
Jessica Salisbury (Radiographic Science, B.S.)
Ingrid Sandoval Mendoza (Health Science, B.S.)
Makayla Searle (Radiographic Science, B.S.)
Abbi Summerill (Health Science, B.S.)
Kristina Welborn (Nursing Practice, DNP)
Abigail West (Speech-Language Pathology, MS)

Kasiska Division of Health Sciences: College of Pharmacy

Duncan Andrus (Pharmacy, Pharm.D)
Mikayla Antonson (Pharmacy, Pharm.D)
Sina Dehestani (Pharmaceutical Science, PhD)
Biwash Ghimire (Pharmaceutical Science, PhD)
Pradeep Giri (Pharmaceutical Science, PhD)
Elizabeth Kara (Pharmaceutical Science, PhD)
Sophia Kirsinas (Pharmacy, Pharm.D)
Samuel McKnight (Pharmacy, Pharm.D)
Skyler Messick (Pharmacy, Pharm.D)
Christopher Nicolet (Pharmaceutical Science, PhD)
Anyauba Nmaju (Pharmaceutical Science, PhD)
Jordan Oman (Pharmaceutical Science, PhD)
Brittney Patton (Pharmacy, Pharm.D)
Victoria Pham (Pharmacy, Pharm.D)
Rachel Ray (Pharmacy, Pharm.D)
Clayton Salmon (Pharmacy, Pharm.D)
Pooja Sapkota (Pharmaceutical Science, PhD)
Janhabee Shrestha (Pharmaceutical Science, PhD)
Alexis Simpson (Pharmacy, Pharm.D)
Jiemin Yuan (Pharmaceutical Science, PhD)

Kasiska Division of Health Sciences: Health Residents

Jake Arbon (Psychiatry Residency)
Kristen Caldwell (Pharmacotherapy Residency)
Cody Cunningham (Family Medicine Residency)
Mary Cutright (Pharmacotherapy Residency)
Chaston Ellis (Psychiatry Residency)
Leah Fortson (Psychiatry Residency)
Landon Hillebrant (Family Medicine Residency)
Harrison Hoskins (Pharmacotherapy Residency)
Ryan Kelley (Psychiatry Residency)
Colton Phippen (Family Medicine Residency)
Sheldon Wernick (Family Medicine Residency)

Abstracts

Graduate Abstracts

Susana Agudelo

Subject: Business, Economics & Public Administration

Leveraging Artificial Intelligence to Enhance Functionality of Electronic Health Records

Background: Inefficiencies in healthcare delivery, such as documentation delays, disjointed patient data management, and the intensified workload on healthcare providers, emphasize the urgent need for more robust health information systems. Critical vulnerabilities in traditional electronic health record (EHR) systems became evident during the COVID-19 pandemic, pushing the need for innovative solutions. Objective: To examine the potential of artificial intelligence (AI) to enhance EHR functionality and to address healthcare system challenges. Methods: A qualitative research methodology, including a literature review of both peer-reviewed articles, gray literature, and an interview with an Information Technology expert. Results: Current limitations of traditional EHR systems contribute to clinician burnout and reduced patient interaction. Ethical concerns, implementation costs, and regulatory gaps challenge AI adoption. Nevertheless, the capabilities of AI can be used to integrate and optimize EHRs, leading to more resilient and efficient healthcare delivery. Addressing challenges through improved AI literacy, interoperability, and data governance is an approach towards a cost-effective solution that might translate into more time for provider-patient interaction and a better handling of patient records. Recommendations to address these challenges focus on improving AI literacy, enhancing interoperability standards, developing robust data governance frameworks, and expanding financial support mechanisms. AI-driven innovations, like automated data entry and real-time analytics show promise for streamlining processes and improving patient outcomes.Conclusion and Implications: AI advancements could be implemented effectively to enhance EHR functionality and improve patient care, provided US healthcare authorities assign appropriate priority to AI applications. These innovations offer a pathway to more resilient, efficient, and equitable healthcare delivery, ensuring preparedness for unexpected health situations while maintaining a strong focus on patient care.

Ashley Ben-Jacob, Kristina Blaiser, Elaine Foster, Marie Martinez, and Blair Richlin

Subject: Education, Learning & Training

Applying sports coaching standards in family-centered early intervention

Coaching in early intervention (EI) is crucial for improving developmental outcomes in Deaf or Hard of Hearing (DHH) children (Noll et al., 2021). This approach focuses not only on enhancing a child's skills but also on empowering families to support language development (Brock, 2023). Although research shows that coaching leads to better outcomes (Noll et al., 2021), few providers integrate coaching behaviors when working with families (Friedman et al., 2012). While the application of coaching in EI for DHH children is relatively new, the concept is well-established in sports and athletics, where national standards guide effective practices (Gano-Overway et al., 2021). In contrast, research-based standards for EI coaching are still emerging. Moeller et al. (2024) recently identified ten evidence-informed principles to advance family-centered early intervention for DHH children. Despite these advances, many aspects of EI coaching remain underexplored. This presentation will demonstrate how key elements of sports coaching can be adapted to early intervention contexts. By bridging these two fields, we can enhance our understanding and implementation of coaching strategies that foster the development of young DHH children, ultimately benefiting both the children and their families.

Indianna Berg, Amy Hunt, Dani Moffit, Karla Judge, and Garret Wood

Subject: Health, Nutrition & Clinical Sciences

CPR and AED Availability in Public Schools in a Pacific Northwest State

Cardiac events have become more prevalent in today's society, regardless of age of the person. Cardiopulmonary Resuscitation (CPR) training is readily available to the public, and should be part of a public school policy for all employees. The availability of Automatic Electronic Defibrillators (AEDs), along with employee CPR training, could play a major role in the survival of any individual experiencing a cardiac event, especially if emergency medical care is not readily available. The purpose of this study was to identify how many public school employees in Idaho maintained CPR and AED training, the accessibility of AEDs, as well as the distance from the school to the nearest healthcare facility. The study was an observational cross-sectional design. A survey was sent to 595 public, co-ed schools in Idaho, and was distributed via Qualtrics. This survey was used as part of a larger study focused on the overall safety within public schools. Public schools in Idaho are limited in staff who are certified in CPR and AED use. Several schools reported that neither the teachers nor coaches were certified. Teachers and coaches are the individuals who interact with the students the most, and are the most likely to be on the scene of a cardiac emergency. Two schools within our survey asked for help and for more funding in the comments section of the survey, and both of these were located in rural areas. Only 39% of secondary schools in Idaho have athletic trainers. This is a disservice to the 61% of the schools' athletes which do not employ athletic trainers, especially those in a rural setting. All athletic trainers are certified in the use of AEDs and CPR in emergency situations and could provide a valuable service to school populations.

Ethan Bonham

Subject: Humanities, Behavioral & Social Sciences

A Content Analysis of Canine Therapy on Youth in Juvenile Detention Centers

Canine Assisted Therapies (CAT) have proven to be an effective intervention for the rehabilitation of adults within correctional facilities, promoting improvements in mental health, social skills, and self-responsibility. This poster explores how these therapies can be applied to incarcerated youth, a unique demographic that is faced with rehabilitation and developmental challenges. With such a large population of youth detained worldwide, there is a pressing need for effective strategies to ensure rehabilitation and reintegration into society. Through the evaluation of existing research, this poster will examine how youth within the justice system have responded to the use of canine assisted therapies. Published findings from 2013-2023 on the topic of canine-assisted therapies within correctional facilities were reviewed to evaluate benefits and connections between youth in correctional facilities and CAT. Peer-reviewed articles included self-report studies, quasi-experimental designs, and qualitative research. The research questions are as follows: How do canine assisted therapies impact the mental health, social skills, and self-responsibility of incarcerated youth? What factors influence the successful implementation of these programs within juvenile correctional facilities? Key terms for the analysis included; counseling, animal assisted therapies within the justice system, animal assisted therapies in counseling, counseling within juvenile detention centers. The presenter found evidence that the presence of canines within juvenile correctional facilities has a positive impact on youth in the form of support, comfort, security, and self-care. Participation in animal assisted therapies in juvenile detention centers is associated with reduced recidivism rates and the development of skills essential to contributing to society. Future interventions could focus on training programs for both canines and youth to further enhance therapeutic effectiveness and societal contribution. These findings are relevant to the field of counseling, specifically AAS. Current research suggests that CAT is beneficial for mental states of youth while in the correctional system and in lowering recidivism rates. Further studies are suggested focusing on longitudinal designs and cross-cultural contexts.

Tyler Breech, Janet Loxterman, Ernest Keeley, and Shawn Narum

Subject: Biological & Natural Sciences

Recolonization and movement limit deep divergence patterns among Rainbow Trout populations

Species with broad geographic ranges often exhibit significant intraspecific diversity in behavior, morphology, physiology, or life history characteristics. Although intraspecific diversity has often been recognized by subspecies names, evolutionarily significant units, and distinct population segments, evaluating phenotypic differences over such a broad range can prove difficult from lack of standardization and amount of effort for data collection. Alternatively, genetic data can be useful in comparing distant populations, and have been successful in evaluating differences over species ranges. In widely distributed species that exhibit substantial diversity, describing major evolutionary lineages provides critical information about the main axes of variation and a framework to examine fine scale or adaptive differences. Rainbow Trout (Oncorhynchus mykiss) is a salmonid species that exhibits one of the largest latitudinal ranges among fishes. The extensive variation within Rainbow Trout has been recognized for decades and attempts to organize it have varied from recognizing numerous species to subspecies, but have been consistently confounded by phenotypic plasticity, morphological overlap, and local adaptations. However, no phylogeographic study of Rainbow Trout has determined whether the current hypothesized subspecies encompass the main evolutionary lineages of Rainbow Trout. We gathered mtDNA sequence data from Rainbow Trout and sister taxa by sampling across the central portion of the species range followed by supplementing our dataset with samples from other agencies, researchers, past studies, and public databases. The subsequent dataset has a geographic range from Mexico to Alaska, and includes at least one representative from nearly all hypothesized lineages, resulting in possibly the most extensive compilation of Rainbow Trout mtDNA sequences to date. Haplotype analysis of the final dataset of 1190 fish from 364 locations (Fig 1) yielded 145 unique haplotype sequences. We identified seven major haplogroups in the phylogenetic tree based on bootstrap support above 50% at major nodes and branch length differences.

Kierra Burns

Subject: Humanities, Behavioral & Social Sciences

Medieval Milk

Human lactation represents one of the most fundamental aspects of motherhood and the female experience and remains one of the few societal spaces that exists almost exclusively for women. However, not until the 20th century did we develop a scientific understanding of the mechanisms of human milk. My research examines the beliefs, attitudes, and practices around lactation in the medieval period, from the natural role of mothers as nurturers in Early Medieval England, to the sometimes bizarre mystical lactation miracles and visions of the lactating Christ in the 12th to 14th centuries, to the practical medical and folk knowledge passed on throughout the Middle Ages. Through original translation (from Old and Middle English) and historical research, I aim to add to our understanding of medieval lactation beliefs and show how they affected the lives of women, even echoing down to our modern age.

Katelyn Cathcart, Joshua Swift, Eliana Claps, and Jacob Bingham

Subject: Humanities, Behavioral & Social Sciences

The Influence of Therapist Recreational Alcohol Use on Client Perceptions of Therapeutic Alliance: A Survey Study

A strong therapeutic alliance is one of the most consistent predictors of success in psychotherapy (Aafjes-van Doorn et al., 2024; Videtta et al., 2025). Research has examined various factors that contribute to this alliance, including therapist self-disclosure (Price & Jones, 1998; Knox & Hill, 2003; Kottler, 2003). Although there is ongoing theoretical debate regarding the role of self-disclosure in therapy, the impact of

such disclosures on the therapeutic relationship and outcomes remains inconclusive. Much of the research has concentrated on intentionally shared personal information, but less attention has been given to the effect of information clients might inadvertently learn about their therapist—particularly regarding sensitive issues like recreational alcohol use. The influence of such unintentional knowledge on clients' beliefs and stigma perceptions is still largely unexplored. This study seeks to investigate the relationship between therapists' public behaviors (including therapist control, casual drinking, and public drunkenness) and perceived working alliance (WA) outcomes. It also considers how both self-stigma and perceived public stigma might serve as potential mediators or moderators. An ongoing survey was administered to ~50-100 participants to explore how these conditions influence WA outcomes and to assess the role of stigma in this dynamic. Furthermore, the survey included open-ended questions to understand (1) client perspectives on whether they should bring up their therapist's behavior in their therapy session, (2) their opinions on whether therapists should avoid drinking in public, and (3) their opinions on whether therapists should avoid getting drunk in public. Preliminary quantitative data analyses, along with themes from the open-ended responses, will be presented. While the survey was launched in January 2025 and we anticipate reaching our target number of participants by the presentation date, we have already identified emerging themes from the open-ended questions that explore the ethical perspectives of current and former psychotherapy clients. This project will offer insights into the potential impact therapist behaviors have on client perceptions of therapeutic relationships and broader implications for stigma management in therapeutic contexts.

Arifa Islam Champa, Md Fazle Rabbi, Farjana Eishita, and Minhaz Zibran

Subject: Education, Learning & Training

See, Learn, Act: Visual Cues in Learning to Detect Phishing Attempts

Phishing attacks are a growing cybersecurity threat that exploit human vulnerabilities to steal sensitive information. The increasingly sophisticated phishing tactics highlight the need for education and training to empower users with stronger defenses. This study focuses on how educational strategies, such as email categorization, visual cues, and explanatory feedback-based learning, improve users' ability to detect phishing emails. We conduct a user study with 55 participants, designed to evaluate learning and performance across three tasks: (1) detecting phishing emails without visual cues, (2) detecting phishing emails with visual cues that highlight suspicious elements, and (3) detecting phishing emails without cues but after receiving explanatory feedback with correct answers. In each task, participants identify 10 emails evenly split between phishing and non-phishing, drawn from five categories: "Authority and Social Compliance", "Distraction and Overload", "Liking, Similarity, and Deception", "Social Proof and Herd Mentality", and "Visceral Triggers", to assess performance across phishing types. The results reveal that visual cues provide modest improvements in accuracy, while explanatory feedback significantly enhances learning outcomes. Feedback helps participants remember what they learned, match their confidence to their actual performance, and apply their knowledge to new emails. Participants performed well with emails in the "Social Proof and Herd Mentality" category but struggled with emails belonging to "Liking, Similarity, and Deception" category. These results emphasize the importance of tailored training programs that incorporate visual aids and explanatory feedback to improve decision-making and reinforce learning. This study provides key insights for designing effective education and training programs aimed at reducing the impact of phishing attacks. By combining these approaches with automated detection systems, we can better prepare users to recognize and respond to phishing threats, ultimately strengthening overall cybersecurity.

Eric Christen, Erika Stewart, Joshua Grinith, and Anirban Chakraborty

Subject: Biological & Natural Sciences

Effects of Soil Amendments Targeting Roadside Revegetation on Soil Chemistry and Microbial Diversity in South-Eastern Idaho

Roadside restoration efforts target many different outcomes such as fire management, invasive weed control, and erosion, and can be achieved by promoting the growth of native plant assemblages. Soil amendments, such as seed mixes, pesticides and fertilizers, are a widely used management practice to control the growth of native and invasive plant species. While these soil amendments have individually been effective for native plant growth, it remains unclear as to how combinations of soil amendments may affect soil health in terms of microbial diversity and soil chemical properties. We hypothesized that a combination of soil amendments will lead to alterations in diversity and abundance in the soil microbial assemblages by providing elevated levels of nutrients for microbes to access. To address this hypothesis, a collaborative soil amendment project was initiated in March of 2022 at three sites owned by the Idaho Transportation Department along Interstate 15 in Southeastern Idaho, with each site containing 90 experimental plots distributed within six blocks. The soil amendments tested consisted of a glyphosate herbicide spray, a non-synthetic high-micronutrient fertilizer, a wool pellet-based fertilizer, and a commercial microbial spray containing bacterial and fungal strains. Two factorial experiments were set up crossing the herbicide, microbial spray, and the two fertilizers in plots at each site. A set of 130 homogenized soil samples from the experimental plots were collected in each summer from 2022 – 2024.. Soil microbial assemblages were analyzed using high-throughput 16s rRNA gene amplicon sequencing on Illumina MiSeq platform while soil chemistry was analyzed using a suite of analytical tools. Beta diversity analyses revealed significant community dissimilarity among the three sites and differences in microbe treatments. Soil chemistry data showed an elevated level of nitrate in one of the three sites along with increased levels of copper in some plots containing the high-micronutrient fertilizer.

Carley Church, Tali Rotman, Nashrah Maamor, Garrett Anderson, and Curtis Billings

Subject: Health, Nutrition & Clinical Sciences

Factors influencing speech-in-noise performance

Hearing loss is an important factor affecting how a person understands speech in background noise. However, there is variability in performance on speech-in-noise tasks that cannot be explained completely by hearing ability. Aging can also influence speech-in-noise performance, along with cognitive factors like executive function and working memory. We tested three groups varying in age and hearing ability to determine the relative contributions of these factors to speech-in-noise recognition and cognitive tasks. Young individuals with normal hearing , older individuals with close-to-normal hearing, and older individuals with hearing loss were tested. Speech-in-noise recognition tasks included a word test (Words in Noise) and two sentence level tests (Quick Speech-in-Noise and the Listening in Spatialized Noise-Sentences). Cognitive tests included the Digit Span, Stroop Color-Word, and Trail Making Tests. The young individuals with the normal hearing group performed the best on all the speech-in-noise tests when compared to the two older groups, and the more normal hearing older group performed better than the older group with hearing loss. For the cognitive tasks, again the young normal hearing group performed the best, with the two other groups performing similarly to each other, but worse than the young normal hearing group for most of the tests. Age and hearing loss both have robust effects on speech-in-noise recognition tasks, with age showing the stronger effect on cognitive tasks, perhaps because most of the cognitive tests are not presented exclusively in the auditory modality. The relationship between cognition and speech-in-noise recognition will also be discussed.

Eliana Claps and Joshua Swift

Subject: Education, Learning & Training

The Impact of Self-Care Education on Undergraduate Well-Being, Happiness, Flourishing, and Academic Burnout

The transition into college is often marked by increased stress due to various new academic and social challenges, and college students often experience mental health concerns; however, few students take advantage of college campus psychotherapy services. Considering the mental health needs of college students and the lack of help-seeking in this population, there is a need to examine methods for bringing treatment principles, like self-care, to the general public. Research suggests that teaching self-care strategies can be a successful tool to combat educational stressors. Yet, there is a significant gap in the literature exploring the impact of formal self-care education in a college sample. The present study examined the influence of formal self-care education on undergraduate well-being over a semester. Idaho State University undergraduate students enrolled in a self-care class (n = 71) were compared to a control group (n = 130) on measures of happiness, mental well-being, flourishing, and academic burnout over the fall semester. Results indicated that those in the self-care class reported significantly greater mental well-being (p < .001), happiness (p < .001), and flourishing (p <.001), and significantly less academic burnout (p < .001) by the end of the semester compared to those not enrolled in the self-care class. These findings highlight the importance of self-care education for undergraduate well-being.

Sarah May Clarkson

Subject: Humanities, Behavioral & Social Sciences

Child Marriage in India: Its Profound and Lasting Consequences

Child marriage (legal or religious marriage before age 18) has long been cultural practice in India. Despite legislative and social efforts to discourage it, child marriage continues as both a custom, a tradition, or in response to familial / economic circumstances and turmoil.

India is a nation of great consequence: the most populous country on the globe with 1.4 billion people, by far the world's largest democracy (four times that of the U.S., the second largest democracy). Indian tradition is a powerful force. But tradition has its own consequences, obscuring practices and social problems that arise out of desperation (personal and economic), natural disaster, or political unrest. Examined from the perspectives of anthropology and history, this poster will present the research questions, areas of focus and analysis, responses to the issue, and proposals for change. Additionally, the poster will encourage participation and engagement by asking probing questions, seeking input from attendees. Child marriage in India has negative impacts not just on girls married too young but also their children. Child brides lose their personal autonomy, educational and employment opportunities, their mental and physical health is often compromised. Girls can be vulnerable to child marriage during times of climate crisis, when a family's livelihood is tenuous, or when there is social or political disorder. The children of such girls face similar circumstances, perpetuating a cycle of struggle. By encouraging education and delaying marriage, Indian girls can secure their futures, which benefits not only them, but also any children they might bear, their communities, their nation. A bellwether of the status of women around the world and a measure of the strength of its democracy, the subject of child marriage in India calls for attention and examination.

Camryn Collman, Ethan Flabel, and Landon Duval

Subject: Humanities, Behavioral & Social Sciences

The Invisible Opponent: Mental Health Challenges in Student-Athletes

Student-athletes experience unique mental health challenges from the pressures of competition, academic responsibilities, and social expectations. Research indicates that 22.3% of student-athletes face risk of depression, with additional concerns including anxiety, low self-esteem, and burnout (Weber, 2023). These challenges are further exacerbated by external stressors like social media influence, NIL (Name, Image, and

Likeness) agreements, and the increasing number of collegiate athletes (NCAA, 2022). Despite the prevalence of mental health struggles, stigma and systemic barriers often prevent athletes from seeking support. This presentation synthesizes existing research to examine the psychological challenges faced by student-athletes and explores evidence-based strategies for mental health professionals to better support this population. This draws on research findings from studies examining the mental health of NCAA Division I and II athletes aged 18–26, highlighting key risk factors such as depression, anxiety, and performance-related stress. Additionally exploring literature on the impact of social media, burnout, the stigmatization of mental health services, identity shifts following athletic transitions, and the psychological effects of abusive coaching practices. Attribution theory (Weiner, 1974) is applied to understand student-athlete motivation and its implications for both academic and athletic performance. Ethical, legal, and multicultural considerations related to counseling student-athletes are also discussed. Existing research suggests that student-athletes face higher rates of depression, anxiety, and low self-esteem compared to non-athletes. Studies emphasize need for early intervention, culturally competent counseling approaches, and resilience-building strategies to address these concerns. Supporting the mental health of student-athletes requires a multifaceted approach. Research-based strategies, including responsible social media use, resilience training, career counseling, and tailored mental health services, are essential for improving outcomes. Mental health professionals must also navigate ethical challenges like confidentiality, dual relationships, and NCAA regulations while being culturally responsive. This provides an overview of current research and practical recommendations to enhance mental health support for student-athletes.

Angelina Conrow

Subject: Humanities, Behavioral & Social Sciences

Psychotherapy Stigma and Its Origins: Mental Health Disorders, Treatment-Seeking, or Both?

Stigma has been identified as a significant obstacle for many when it comes to getting treatment for mental health concerns (Corrigan, 2004; NAMI, 2021; Vogel et al., 2006). To best address this stigma, it is important for the field to have a thorough understanding of why it exists. Current studies have yet to fully address whether stigma toward psychotherapy is based on the act of seeking and engaging in psychotherapy or whether it is based on the assumed experience of having a mental health concern. The aim of the current study was to experimentally test this nuance to better identify the origins of stigma toward psychotherapy. Participants were college students recruited through SONA. Participants were randomized into one of six conditions, where they unknowingly interacted with a confederate who they believed was another research participant. During the interaction, the confederate disclosed that they were or were not experiencing a mental health disorder. They also disclosed either engaging in psychotherapy, engaging in exercise, or doing nothing. Participants then rated the confederate on a number of dimensions, including willingness to work with the confederate for a series of social games and perceptions of the individual.

RaeVonne Cox and Joseph Do

Subject: Humanities, Behavioral & Social Sciences

Connected for a Better World: Human, Animal, and Environmental Welfare – Implications for Health Care Professionals

The One Welfare model is an integrative health framework emphasizing the interwoven dynamics between human well-being, animal welfare, and environmental health. Garcia Pinillos et al. (2016) postulate that as the welfare of one component increases, the others benefit. For example, humans often gain mental health benefits from accessing nurtured green space (Garcia Pinillos et al., 2016). Additionally, participation in animal welfare training has been shown to decrease rates of domestic and interpersonal violence in human communities (Garcia Pinillos et al., 2016). One Welfare's application is widely recognized in many

disciplines, including veterinary and agricultural sciences. However, its relevance to healthcare professionals remains predominantly underexplored. This literature review examines the application of One Welfare's model within healthcare settings. The complexity of mental health challenges indicates the influence of environmental and social determinants, necessitating a more holistic approach to quality client care (Bourque, 2017). Behavioral healthcare practitioners can benefit from this model by incorporating it into assessment, treatment, and advocacy. Through the interrelated relationships between human mental health, animal welfare, and environmental factors, the One Welfare model promotes a more comprehensive approach to improving patient outcomes.

Serenity Crabb and Lucie Pelland

Subject: Education, Learning & Training

Transformational Leadership for Effective Injury Prevention Protocols

Ensuring the health and well-being of student-athletes is an essential component of NCAA athletic programs. Injury prevention is fundamental to achieving this goal. However, the culture of sport—including the beliefs, attitudes, and values of athletes and coaches—often poses a barrier to implementing effective injury prevention programs at the individual player level. This research aims to evaluate the effectiveness of using a transformational leadership model to guide the implementation of an evidence-based injury prevention program for NCAA athletes. We hypothesize that applying a formal leadership model will identify novel avenues for health research that can better support the translation of research evidence into practice in sports medicine. Translational research is needed to support the implementation of an evidence-based injury prevention model that we developed in Fall 2024 for athletics at Idaho State University. The program is based on three key principles: continuation, communication, and commitment. The transformational leadership model incorporates two mediating factors: open-mindedness and leader-member exchange knowledge creation. Decision mapping is used to align program implementation steps with the transformational leadership model. This mapping will help identify and prioritize research questions, methods, and the evaluation plan. The implementation of programs for student-athlete health and well-being, including injury prevention, is significantly limited by social factors such as the values, beliefs, and attitudes toward risk held by coaches and athletes. Transformational leadership has been shown to provide an effective framework for knowledge co-creation and system-level change. If successful, our proposed application of this leadership framework for knowledge translation and change at the individual level would offer a unified approach to designing and implementing programs that optimize student-athlete health and well-being.

Antora Dev

Subject: Engineering, Physical & Mathematical Sciences

Advanced Deep Learning Framework for Automated Segmentation and Quantification of Vascular Bundles in Corn Stalk μ-CT Images

In the pursuit of sustainable energy, understanding the structure of vascular bundles in lignocellulosic biomass is crucial for optimizing biomass production and biofuel efficiency which requires accurate phenotyping of biomass feedstocks. While microcomputed tomography (μ-CT) holds great promise for analyzing the microscopic features of vascular bundles, its application in segmenting these structures faces challenges related to time consumption, low contrast, and high levels of noise in the images. This study integrates advanced deep learning models, including Traditional U-Net, Attention U-Net, SegNet, DeepLabV3, and Detectron2, to improve segmentation accuracy. Additionally, an automated quantification framework using morphological operations such as dilation and erosion ensures reliable vascular bundle measurement. This study follows a structured process involving image preprocessing, deep learning-based segmentation, and automated quantification. μ-CT images of corn stalks were converted to grayscale, contrast-enhanced, and filtered using Gaussian blurring. Deep learning models, including Traditional U-Net, Attention-based

U-Net, SegNet, DeepLabV3, and Detectron2, were trained on manually labeled vascular bundle datasets. For quantification, morphological operations refined segmentation outputs, with optimized parameters for kernel size, dilation, and erosion. The automated results were validated against manual counts to assess accuracy. Detectron2 achieved the highest segmentation accuracy (99.91%) and the lowest test loss (0.0239), outperforming other models. While SegNet was computationally efficient, Detectron2 provided the most precise results. The quantification framework, optimized using morphological operations, successfully identified 105 vascular bundles, matching manual counts. Hyperparameter tuning played a critical role in refining quantification results, ensuring segmentation robustness. This automated method of phenotyping offers a high throughput over manual segmentation and quantification, substantially reducing the time and effort involved in meticulous analyses, further demonstrating effectiveness deep learning techniques for precise identification of vascular bundle structures ultimately advancing sustainable energy solutions.

Saugat Dotel, Taha Ahmed, Mustafa Mashal, Mahesh Acharya, and Mohammad Hany Yassin

Subject: Engineering, Physical & Mathematical Sciences

Laboratory Evaluation of Glass Fiber Reinforced Polymer (GFRP) Bars to Improve Joints in Natural Fiber Reinforced Concrete (NFRC) Pavements

The construction industry is rapidly shifting towards sustainable practices, with Natural Fiber Reinforced Concrete (NFRC) emerging as a promising eco-friendly alternative to conventional concrete. While NFRC offers enhanced mechanical and thermal properties, its use in pavements remains largely unexplored due to limited research on its performance and load transfer behavior. Traditionally, steel dowel bars are used to facilitate the load transfer mechanism between jointed slabs in concrete pavements, but their susceptibility to corrosion often compromises their effectiveness. Glass Fiber Reinforced Polymer (GFRP) bars offer a corrosion-resistant, sustainable alternative to conventional steel bars while maintaining the required structural integrity. This study aims to investigate the potential of GFRP as an alternative load transfer dowel to enhance joint performance in flax fibers-incorporated NFRC pavements. In the initial phase of the study, two concrete mixes were evaluated: one conventional concrete mix (CC Mix) and one natural fiber-reinforced concrete mix (NFRC Mix) incorporating flax fiber. In the second phase, a steel dowel bar of size X1 will be evaluated for both mixes. CC Mix with steel dowel bars of X1 diameter will be considered the benchmark mix in this study. Additionally, three sizes of GFRP bars will be evaluated starting with the X1 size followed by two other diameters, one larger and one smaller than X1 diameter (namely, X2 and X3). Lengths, diameters, quantity, and spacing of dowel bars, along with slab thickness, will be under the guidelines from the American Concrete Pavement Association (ACPA), AASHTO Rigid-Pavement Design Procedure, and the Idaho Transportation Department.

Rhys Ellis, Anirban Chakraborty, Brinley Smith, and Brooke Wheeler

Subject: Biological & Natural Sciences

Dispersal of Dormant Bacteria in Deep-Sea Sediments

A major aspect of environmental microbiology work is studying how cells move and disperse within the environment. I specifically look at how cells disperse in the deep ocean using thermophilic endospores (thermospores) as a model organism. This is due to thermophilic endospores being resistant to selective pressure, and their status as thermophilic cells being displaced and non-native in the cold sea floor environment. This theory of dispersal and thermospores has been well studied with cold seeps, or hot reservoirs below the seafloor that expel to the seafloor, but this is only one geologic feature that may source these spores. I aim to look at different geologic features, specifically crustal aquifers, to compare diversity of these model organisms and relationship between these features. The study site for this specific project is a deep sea sampling device off the coast of Oregon, in Juan de Fuca Ridge, that has been broken for the last decade and causing crustal fluid water to associate with ocean water. This is significant as the two are

generally separated and have distinct chemical and microbial profiles. I aim to see if there is any noticeable difference in the dormant community at this site compared to others that may be found regionally, and potentially globally. My thesis involves looking at the diversity in displaced cells in crustal fluid associated sediments at two different sites in Juan de Fuca Ridge. In order to do this, I need the dormant cells to exit dormancy, as I cannot do any further analysis due to the toughness of these cells. This will involve creating an artificial environment for them, characterized by it being high temperature, anoxic, and having an artificial seawater mix as a medium for them to grow in. I sub-sampled at regular intervals, and have done growth assays to see when specific cells from 5 different sites exited dormancy. This involves analysis of sulfate depletion, as well as the change in concentration of 6 different organic acids.

Nusrat Farheen, Mathew Shumway, Evan Mosher, Keyave Hone, Marco P. Schoen, and Mary Hofle

Subject: Engineering, Physical & Mathematical Sciences

Non-Destructive Detection of Hollow Heart in Potatoes Using Artificial Intelligence

Quality control in potato processing faces a critical challenge in detecting hollow hearts, an internal defect that significantly impacts product value. The potato industry currently relies on destructive sampling methods, requiring physical cutting of samples for inspection, which leads to product waste. In Idaho alone, where annual potato production reaches 121 million hundredweight, hollow heart defects contribute to losses of $86 million, affecting 6,895,000 hundredweight of produce. This study addresses the urgent need for a non-destructive, automated detection system that can efficiently identify hollow heart defects while maintaining product integrity. Two non-destructive testing approaches were developed and evaluated using 334 potato samples: an acoustic data acquisition method was performed through drop tests using a microphone positioned above a sponge-cushioned container, while video capture on a shaker table was employed to extract potato position and dimensional measurements. Both methods are undergoing continuous data collection to enhance model robustness. Initial evaluation using 334 potato samples focused on acoustic analysis, where traditional machine learning models (Support Vector Machine and Boosted Trees) were evaluated using extracted acoustic features. Additionally, acoustic signals were transformed into Mel spectrograms for deep learning analysis using EfficientNet B0 architecture. Machine learning analysis of video-based experimental data is planned for future work. For the acoustic method, initial machine learning approaches using extracted acoustic features showed promising results, with Support Vector Machine and Boosted Trees achieving accuracies of 78.7% and 81.7% respectively, while a significant improvement was achieved by transforming acoustic signals from potato impacts into Mel spectrograms for deep learning analysis. The acoustic-based EfficientNet B0 architecture achieved 87% accuracy with comprehensive metrics (F1-score: 0.87, precision: 0.91/0.84, recall: 0.83/0.91), demonstrating better classification capabilities compared to traditional methods. This research establishes the effectiveness of combined acoustic and video-based non-destructive testing for hollow heart detection, providing a practical solution for automated quality assessment in industrial applications.

Dallen Farmer

Subject: Health, Nutrition & Clinical Sciences

Eastern Idaho State Fair Public Safety Improvement Project

The Eastern Idaho State Fair Public Safety Improvement Project seeks to enhance public safety measures, interagency collaboration, and situational awareness at the Eastern Idaho State Fair (EISF). The fair, which attracts over 245,000 attendees annually, presents complex public safety and emergency management challenges due to its large crowds, diverse event activities, and other uncontrollable factors.
This project identifies key vulnerabilities in the current public safety framework, including fragmented communication among agencies, lack of standardized emergency response protocols, and limited integration of modern situational awareness tools. The project examines how interagency coordination,

technological integration, and strategic response planning can improve safety outcomes by employing tools in the systems-thinking approach framework. A mixed-methods research design was utilized, combining stakeholder interviews, observational analysis, and literature review to assess current safety practices and develop data-driven recommendations. Case studies from incidents at similar large-scale events inform best practices for risk mitigation and emergency preparedness. The proposed solutions include enhanced situational awareness through real-time surveillance and data analytics, improved interagency communication via a centralized command system, and implementation of standardized public safety protocols. A comparative analysis evaluates the effectiveness of these solutions against existing fair security measures, the financial impacts of employing various options, and the best bang-for-your-buck approach to ensuring public safety at this increasingly popular community event. Initial improvements have already demonstrated tangible benefits, including daily Event Action Plans (EAPs), enhanced emergency briefings, and a digital messaging platform for public safety personnel. The project recommends a hybrid approach combining tactical emergency response with proactive risk assessment and interagency collaboration to create a scalable, efficient public safety model for EISF and many other similarly scaled events.

Emily Fitterer

Subject: Education, Learning & Training

Deafness and Autism

Deafness and autism are two of the thirteen disability categories for students with an Individual Education Plan (IEP). When occurring separately, each classification has its own unique challenges. However, when co-occurring, students who are both Deaf and autistic need differentiated instruction and activities in order for them to thrive academically and socially. The following research provides examples of what such instruction looks like and why it is vital to the success of a Deaf and autistic student.

Bridget Fitzpatrick, Kristina Blaiser, and Blair Richlin

Subject: Health, Nutrition & Clinical Sciences

A Systematic Review of Phonological Awareness Interventions for Children who are Deaf and Hard of Hearing: A Guide for Clinicians

This systematic review evaluates interventions for improving phonological awareness (PA) in deaf and/or hard-of-hearing (DHH) children aged 3–9 years. Guided by the PRISMA and PICO frameworks and a a rigorous inclusion and exclusion criteria, 15 studies were selected from an initial pool of 1,075 to answer the research question, “What interventions have the most clinical effectiveness for acquiring and performing phonological awareness skills for children who are deaf and/or hard of hearing and based on the most effective interventions, what are the key characteristics within the research to guide best practices for clinicians?” Each study was analyzed for its reporting of effect size (practical significance) and p-values (statistical significance) and ranked using a four-tier system: Tier 1 (both statistical significance and effect size reported), Tier 2 (effect size only), Tier 3 (statistical significance only), and Tier 4 (neither). Further analysis to identify best practices for real-world implementation focused on five key characteristics: (1) the time commitment required; (2) the domains targeted by the intervention; (3) which intervention category demonstrating the greatest effectiveness; (4) the training requirements for clinicians delivering the intervention; and (5) the hearing characteristics of clients. Multiple patterns emerged from this analysis. First, technology- and music-based interventions emerged as the most effective methods for enhancing PA skills in DHH children aged 3–9. Second, the majority of interventions required clinicians to have specialized training in ASL, music, or behavioral strategies. Third, all reviewed studies focused on visual and auditory domains, with none incorporating tactile or sensory approaches commonly used in clinical practice. Fourth, most participants across studies used hearing technologies and devices. Fifth, the majority of studies had

session lengths of over 20 minutes in duration. By synthesizing these elements, the review aims to bridge research findings with actionable strategies to guide clinical decision-making and practice.

Daniela Francia and Lizbeth de la Cruz

Subject: Biological & Natural Sciences

Investigating the effect of aging in adrenergic receptors in pancreatic islets

The world population is aging. In 2020, it was estimated that the population over 65 would reach 1.5 billion by 2050. Aging is associated with sympathetic nervous system dysfunction2, a key regulator of insulin and glucagon secretion, hormones that regulate glucose metabolism. While age-associated sympathetic system dysfunction has been studied and is associated with organ loss function like in the heart, it is still not clear if this dysfunction impacts insulin and glucagon secretion. The communication between the sympathetic nervous system and the hormone secretion is through adrenergic receptors. Normally, α2 adrenergic receptor activation inhibits insulin secretion through pancreatic β-cells, while β receptor activation enhances glucagon secretion. However, it is still unknown if aging affects adrenergic receptors' expression, function, and localization in pancreatic cells, and if it impacts hormone secretion regulation by the sympathetic system. Pancreas tissue was collected from young mice (4-5 months old) and old mice (25-28 months old). Immunohistochemistry staining of pancreas slices of 300 µm was conducted to identify α1 and α2 adrenergic receptors and insulin (to mark pancreatic islet area). After staining, tissue clearing was done using ethyl cinnamate to make tissue transparent and access to intact islets inside the tissue. Images were taken using confocal microscopy. ImageJ software was used for image analysis and quantification. We successfully standardized the immunohistochemistry of alpha—and beta-adrenergic receptors in young and old tissues. Our preliminary data show that alpha and beta-adrenergic receptors are expressed in pancreatic islets at both ages. We observed that receptor subtypes are distributed differently between cell types. Our next step will be quantifying the receptors to evaluate whether differences are observed between ages. Our data suggested that alpha and beta-adrenergic receptors are expressed in pancreatic islets in both ages. Our next step will be a quantitative analysis to determine if receptor expression changes are associated between young and old ages.

Amanda Froisland

Subject: Health, Nutrition & Clinical Sciences

Evaluating Intimate Partner Violence Awareness and Intervention in Rural Healthcare Settings: A DNP Project

The goal of this project is to assess and enhance healthcare provider readiness and perceptions regarding intimate partner violence (IPV) screening in rural family practice settings, with a focus on improving screening rates, provider confidence, and patient outcomes. By identifying provider discomfort and barriers within rural primary care clinics, the initiative sought to improve clinician education and increase the use of screening tools and patient resources. The primary objective was to enhance provider education, increase the medical staff's comfort level with screening, care for, and refer patients experiencing IPV, and ensure that victims receive appropriate support and treatment. Through educational interventions, the project aimed to positively influence provider perceptions of IPV and their understanding of the significant impact that screening can have on rural communities. By addressing cultural and systemic barriers and equipping providers with the necessary tools and knowledge, the project sought to foster a more supportive and effective healthcare environment for IPV victims, particularly in resource-limited settings. Ultimately, these efforts aimed to facilitate earlier intervention, improve health and safety outcomes for victims, and empower rural primary care providers to screen and respond to IPV with confidence and sensitivity. IPV remains a global health issue affecting people everywhere and causing many secondary health issues that impact patient quality of life and health outcomes. This quality improvement project highlights the need for systemic changes to improve IPV screening rates in rural primary care. The educational piece improved

knowledge, willingness to screen, and provider comfort. Some barriers were still identified, including lack of protocols, time constraints, and unclear strategies to respond if patients are IPV positive. This shows that IPV screening and treatment are not solely on the clinical staff's shoulders but also represent an organizational issue. Future efforts should focus on systematically improving change to help remove barriers recognized to support providers and patients within rural communities adequately.

Biwash Ghimire, Pradeep Giri, Sina Dehestani, Susan Tavernier, and Ali Aghazadeh-Habashi

Subject: Health, Nutrition & Clinical Sciences

Components of the Renin Angiotensin System as Potential Biomarkers of Breast Cancer

The Renin Angiotensin System (RAS) is primarily known for its role in regulation of blood pressure and body homeostasis, but recent studies have revealed its involvement in inflammation and cancer cell progression (1). The RAS is present in both healthy and cancerous breast tissues, and may contribute to the progression of the cancerous cells (2). The RAS consists of two contrasting axes: the classical axis mediated by Ang II promoting cell proliferation and the protective axis mediated by Ang 1-7 which has anti-proliferative effects. Understanding the relationship between RAS and breast cancer (BC) is important, as it may lead to the development of diagnostic biomarkers and potential therapeutic agents to halt disease progression. Patients (N= 21) and sex and age matched health control individuals (n=17) plasma samples were obtained from SpeciCare and St. Luke's based on the IRB approved by Idaho State University. The RAS peptides were analyzed using LC-MS/MS after Solid Phase Extraction (SPE). The plasma ACE2 levels were analyzed using Human ACE2 ELISA kit. Seven cytokines were analyzed Luminex assay. Statistical analyses were done in GraphPad Prism 9.0, with $p \leq 0.05$ being considered statistically significant. BC patients showed higher plasma ACE2 and Ang II levels compared to healthy controls. Although Ang 1-7 levels were not significantly different, the reduced Ang 1-7/Ang II levels in the BC patients suggests a significant RAS dysregulation. There was some trend toward increasing inflammatory cytokine levels in breast cancer patients, but it did not reach to significant levels due to small sample size. The findings indicate that BC disrupts the balance of RAS resulting in activation of the classical axis. The increase in plasma ACE2 concentration in the patients may have been due to the body's defensive response to the overactivation of RAS.

Pradeep Giri, Sina Dehestani, Biwash Ghimire, Susan Tavernier, and Ali Aghazadeh Habashi

Subject: Biological & Natural Sciences

Arachidonic Acid Pathway and Its Metabolites: Biomarkers for Breast Cancer?

Arachidonic Acid (ArA) is released during an inflammatory response through the action of phospholipase 2 (PLA2) and is subsequently metabolized by various CYP450 enzymes, including ω – hydroxylase and epoxygenase. These enzymes convert ArA into eicosanoids like hydroxyeicosatetraenoic acids (HETEs) and epoxyeicosatrienoic acids (EETs). These eicosanoids play a role in various physiological systems (1). For example, 20-HETE, a powerful vasoconstrictor, helps regulate tone, blood flow to certain organs, and the transport of sodium and fluids in the kidneys. It has also been linked to the promotion of tumor growth and metastasis, as they can influence the tumor microenvironment, blood supply, and angiogenesis. EETs, on the other hand, offer strong vasodilatory and anti-inflammatory effects and have shown potential in inhibiting cancer cell proliferation and reducing inflammation (2). Their balance and interactions could play a significant role in the development and progression of breast cancer. Sex and age-matched human plasma samples (N=38) were obtained from SpeciCare and St. Luke's based on the IRB approved by Idaho State University. The analysis of HETEs, EETs, and Dihydroxyeicosatrienoic Acid (DHET) in biological samples is in process using liquid-liquid extraction (LLE) followed by LC-MS/MS quantification. Plasma samples from breast cancer patients will be compared to healthy control groups to evaluate the levels of these bioactive lipids. We expect altered levels of HETEs, EETs, and DHETs in breast cancer patients compared to healthy

controls. Altered levels of HETEs, EETs, and DHETs may correlate with tumor progression, inflammation, and tumor growth. The results could suggest that altered levels of these metabolites may serve as biomarkers for breast cancer progression. Bioactive lipids derived from ArA acid metabolism, including HETEs, EETs, and DHETs, may play a significant role in breast cancer progression. Therefore, the ArA metabolites may be an indicator of breast cancer progression.

Calista Gresick and Anna Grinath

Subject: Education, Learning & Training

Practical Recommendations for Guided In-Class Practice of Visual Representations of Biological Phenomena

The use of visual representations of phenomena enables students to create mental images to better understand the minutiae therein (Nuuyoma & Josef, 2021). Asking students to generate visual representations, therefore, can be a powerful educational tool. For most introductory biology students, however, opportunities to learn and practice generating visuals have been rare compared to other methods of communication such as writing. If we ask students to develop visual representations as part of course assessments, we need to provide opportunities for students to practice those skills, a necessary part of developing proficiency (Lang, 2021). Our study is a context-based action research project studying students' perceptions of how in-class, guided practice supported their learning. We asked students to include a visual representation while making and supporting a claim about a contextualized biological phenomenon. To facilitate the development of the skills we planned to assess, we introduced students to different types of diagrams and their common uses in class, gave students a practice prompt and facilitated discussion about applying visuals to show understanding, and gave students a new prompt as a mock assignment. We gathered feedback via surveys at three key points throughout the class. We restricted our sample to students who responded to the last two survey questions (n=51). We used open coding on ATLAS.ti to analyze students' perceptions on creating visuals. Our findings indicate that 92% of students felt optimistic about their ability to generate a diagram after the in-class practice. After receiving feedback on their first assessments, 98% of students reported that diagrams are helpful learning tools. By the end of the course, 84% of students felt like their ability to create visual representations improved throughout the class. These data indicate that the support we provided was successful, exemplifying previous claims that facilitation of in-class skill development supports success.

Jacob Hall

Subject: Humanities, Behavioral & Social Sciences

How Hong Kong has affected British and Chinese Relations

At the end of the 20th century the British empire was a relic of the past. Having been dismantled piece by piece as colony after colony was granted independence. This process of decolonization began after World War 2 and ended in 1997 when the last British colony, the island city of Hong Kong, was handed back to the Chinese in what was called the Hong Kong Handover. This handover was negotiated under the "One country two systems" approach which has greatly defined Sino-British relations over the course of the 21st century. The big questions though are, why was the People's Republic of China (PRC) willing to make such concessions to the United Kingdom for Hong Kong in comparison to Macau and how has the implementation of the "one country two systems" affected Sino-British relations. This paper is still ongoing, but is based on a research question that I am using a Qualitative Analysis to answer. The question I am looking to answer is, "How has the Chinese government's implementation of the "one country two systems" policy for Hong Kong in comparison to Macau affected the geopolitics between the People's Republic of China, and the United Kingdom?"

Andrew Harmon and Erin Rasmussen

Subject: Humanities, Behavioral & Social Sciences

Effects of Opportunity Costs on Delay Discounting for Hypothetical Food and Money

Delay discounting (DD) refers to the devaluation of a reward as a function of its delay to receipt (Ainslie, 1975). The nature of the delay in discounting studies and the extent to which it is experienced by participants is an important methodological detail. Within the DD framework, opportunity costs refer to the reinforcement that is forgone while waiting for a larger reward (Johnson et al., 2015). For instance, consider a research participant is presented with the question: "Would you rather have 5 bites of your favorite food right now or 20 bites in 1 hour?" If the participant selects the larger reward with high opportunity costs (e.g., remaining at their computer and forgoing access to other sources of food or activities for 1 hr), they may experience subjective discomfort via deprivation or hunger, boredom from sitting in a chair, or loss of access to other reinforcers. However, it is uncertain whether the participant is considering these types of contextual events in their choice patterns. Verbal narratives that specify these opportunity costs would likely impact their decisions. While changes in opportunity costs have been examined for money (Read et al., 2017; Rung et al., 2018; Story et al., 2016) and cigarettes (Johnson et al., 2015), it has not been examined in relation to food. The current study examined how increasing opportunity costs affect DD for food by presenting participants with one of four narratives of increasing opportunity cost prior to competing DD tasks. Results indicated that when opportunity cost is low, participants tended to prefer larger, later food rewards, but not for money. When opportunity cost is high, participants tended to select the smaller, sooner food choices, but not for money. Changes in opportunity costs during delays change sensitivity to delay for hypothetical food, but not money.

Rebecca Hazard

Subject: Biological & Natural Sciences

Microbial and Botanical Fingerprints of Human-Induced Ecological Change

There is an inherent and intimate relationship between people and their environment, which leaves detectable traces that can be extracted, analyzed, and interpreted to build more holistic explanations about human cultural processes and variation. The goal of this doctoral dissertation project is to assess the relationship between prehistoric human land-use patterns associated with horticulture (i.e., farming, gardening, cultivation) and ecological change over time in order to investigate the timing and nature of subsistence and settlement pattern shifts in the southwest Pacific. Specifically, I am interested in identifying when people in post-Lapita Fiji began practicing horticulture more intensively to produce food at an inland site. This is done through the analysis of residual botanical (plant phytolith) and microbial (bacterial and fungal DNA) evidence recovered from terrestrial sediment at an archaeological site in Fiji's Sigatoka Valley. I expect to see a distinct change in both datasets at the point where humans first arrive and begin altering the landscape for the cultivation of introduced plants. For phytoliths, this should be evident in the sudden appearance of morphotypes from non-native introduced plant groups, like banana, as well as a shift from high proportions of tree and shrub phytoliths to those of grasses. For microbial metagenomic data, human cultivation activity will manifest first as a dramatic decrease in overall diversity combined with distinct community shifts. As soils are loosened and amended with material to promote plant growth, overall microbial diversity will begin to recover and functional groups of bacterial associated with cultivation (e.g., nitrifying and cellulolytic) will begin to dominate. Similarly, there will be a rise in fungal groups known to associate directly with plants in symbiotic relationships, and a possibility for novel species introductions due to the transplantation of imported plant stock.

Anthony Hinders, Grace Cain, Katrina White, Heather Ray, and Devaleena Pradhan

Subject: Biological & Natural Sciences

Playing for Both Teams: Molecular Mechanisms of Sex Change in the Bluebanded Goby

Adult sex change occurs in at least 34 families of teleost fish with variation in initial and final sex. This phenomenon is based on numerous environmental factors, including social and abiotic environments such as size, and age, each of which may trigger interactions across a gene regulatory network to induce sex change. This process has been well documented from a macro perspective, with morphological and behavioral data collected for a number of species, including the bluebanded goby Lythrpynus dalli. Molecular level mechanisms, however, remain unclear in how these networks interact or how they regulate long term behavioral and morphological changes. Key genes such as cyp19a1 (aromatase) and 11 beta-hydroxysteroid dehydrogenase 2 (11βHSD2), that code for enzymes responsible for synthesizing estrogens and androgens respectively, are expected to play critical hormonal roles. For protogynous (female to male) sex change specifically, doublesex and mab-3 related transcription factor 1 (DMRT1) and its role in development of male tissues and activation of other critical genes tied to testis development is also expected to be crucial. This research aims to illuminate the process of sex change on the transcriptional level. Utilizing the bi-directionally sexually plastic L. dalli, all female social groups were generated to induce protogynous sex change, with transitioning individuals sacrificed at 5 and 10 days to collect brain and gonadal tissues. Stable non-sex changing males and females were also collected to serve as ‘endpoints’. Ongoing RNA extraction, cDNA synthesis, and quantitative PCR are generating numerical data for gene of interest expression at different timepoints. Preliminary data shows a steady increase of DMRT1 expression with inverse levels presented in cyp19a1b, the peak and valley of which appear ten days into transition. These aromatase levels correlate positively with levels of aggression, but not with increases in parental care and nest guarding.

Virginia Holmgren, Melissa Mezzo, and Travis Schmidt

Subject: Health, Nutrition & Clinical Sciences

IDENTIFYING AND IMPROVING ACCESS TO CARE FOR VETERANS: A QUALITY IMPROVEMENT PROJECT

Veteran suicide represents a complex challenge with profound impact on communities. Veterans account for 14.3% of all suicide deaths among U.S. adults despite comprising only 8.3% of the total population (Monteith et al., 2020). In rural settings, Veterans face significant challenges in accessing essential medical and mental health services compared to their urban counterparts (Monteith et al., 2020; Shiner et al., 2021). The Department of Veterans Affairs reported that in 2021, 6,392 Veterans died by suicide, with a concerning 60% not having accessed Veterans Health Care services (VA, 2023). Community health care providers are often inadequately equipped to address Veterans' complex mental health needs, contributing to a heightened suicide risk, particularly in rural areas where the risk is 20% higher than in urban settings (VA, 2023). Idaho exemplifies this disparity, ranking 5th nationally in suicide rates (CDC, 2022), with rural Veteran suicide rates of 44.9 per 100,000 significantly exceeding the urban rate of 38.8 per 100,000 in 2020 (VA, 2023). To address these challenges, healthcare systems must first prioritize how they are identifying Veterans within their patient populations. Second, they must enhance provider knowledge about Veteran-specific healthcare needs, resources, and self-stigmatizing beliefs. Moreover, improving provider comfort levels and knowledge equips them with the necessary tools to build trust and facilitate referrals to Veteran resources if needed. This study utilized a mixed-methods approach to evaluate the effectiveness of a revised Veteran screening question and culturally competent provider education. The project's dual focus on Veteran identification and provider education led to three key outcomes: increased recognition of Veterans within the healthcare system, improved clinic staff knowledge and communication skills regarding Veteran challenges and resources, and enhanced overall access to appropriate care for Veterans.

Callie Huber

Subject: Business, Economics & Public Administration

AI-Enhanced Credit Memo Evaluation for Financial Decision-Making

Creditworthiness assessment is a critical function in financial institutions, influencing lending decisions and risk management. Traditional credit evaluation methods, though reliable, often require extensive manual effort and are subject to inconsistencies. This project explores the integration of artificial intelligence (AI) to enhance the efficiency, accuracy, and consistency of credit memo evaluations. The primary objective of this project is to develop an AI-driven framework for automating credit memo report writing. By leveraging machine learning techniques and financial analytics, the model aims to provide automated insights into borrower risk profiles, underwriting exceptions, debt coverage, and financial projections for the analyst to review and determine the best course of action. The model utilizes financial statements, qualitative data, probability of default metrics, government entity searches, credit bureau reporting, and historical customer data. Key AI techniques, including natural language processing (NLP) for qualitative analysis and predictive modeling for financial forecasting and insights. The AI system processes structured and unstructured data to assess loan applications, analyze underwriting exceptions, and generate risk scores. Initial analysis indicates that AI-driven models can enhance accuracy and efficiency in credit memo assessments. Compared to manual reviews, the system demonstrates improved consistency in identifying risk factors, loan covenant breaches, and pricing exceptions. The AI-powered approach to credit memo evaluation has significant implications for financial institutions. It offers increased efficiency, reduced subjectivity, and enhanced risk assessment capabilities. By integrating AI into underwriting practices, lenders can make more informed decisions, optimize resource allocation, and improve regulatory compliance. Future research will explore scalability, ethical considerations, and further refinement of AI-driven financial modeling.

Amy Hunt, Indianna Berg, Dani Moffit, Karla Judge, and Garret Wood

Subject: Health, Nutrition & Clinical Sciences

Idaho Public School's Healthcare Team and Healthcare Facility Availability: An Observational Cross-Sectional Study

Healthcare professionals have long been an important part of society; the need for their presence at different sites and events has evolved over the years. Schools may employ nurses, counselors, and athletic trainers (AT) but due to financial reasons, schools may have to rely on only one of these healthcare providers if one is even available at all. If there is no healthcare team then administrators, teachers, or other staff may be considered to be the team since they are the ones in the school most frequently. The purpose of this study is twofold: 1) to determine healthcare providers in Idaho schools, and 2) which member(s) of these teams are regularly on site. A survey created by the researchers and validated by an outside reviewer was distributed via Qualtrics and was sent to 595 public, co-ed schools in Idaho. This survey was part of a larger study focused on safety in public schools throughout the state. The Idaho State Department of Education website was used to assemble the list of schools, contact numbers, and contact emails. The survey was emailed to 595 schools in February and three follow-up emails were sent every two weeks until the end of April. Non-respondent schools were then called for the opportunity to respond. The survey was closed at the beginning of June. Expected response rate was 10%. Public schools in Idaho do not have standards in place for what individuals are considered healthcare professionals within a school setting. Idaho schools reported people as part of their healthcare team who are not considered healthcare professionals. These include administrative assistants, clerics, parents, and students. Less than half the schools had nurses, ATs, or other trained medical professionals available at the school, therefore more healthcare professionals are needed in Idaho schools or additional training is needed for those that are available to act in emergency situations.

Jihae Jang

Subject: Creative Works Category

The Artist Mother Tension: The Days are Long and The Years are Short

The Artist Mother Tension: The Days are Long and The Years are Short, is an examination of what it is to be both an artist and a mother. The challenges that come with juggling dual identities and polarizing experiences are imminent as an artist who is also a caretaker. The artist mother tension is investigated through personal experiences and notable works of artist mothers in history as well as in the present. The lack of representation of an authentic mothering experience in art is further investigated by looking at Maternal Art in the canon of western art history, as well as the impact of the second wave feminist movement. This exhibition will explore my own lineage and personal history, originating from my mother's own experience mothering me, all the way to the present, where I am now mothering my own children.

Elizabeth Kara

Subject: Biological & Natural Sciences

Advancing Aminoglycoside-Induced Ototoxicity Prevention with Zebrafish: A High-Throughput Screening Approach

Aminoglycosides (AGs) are widely used antibiotics, essential in treating life-threatening infections such as sepsis, drug-resistant tuberculosis, and those associated with diseases like cystic fibrosis. Despite their efficacy, AGs can cause permanent hearing loss and/or balance disturbances in over 20% of patients; however, no FDA-approved therapies exist to prevent these untreatable ototoxic side effects. The mechanisms underlying AG-induced ototoxicity remain incompletely understood, complicating the discovery and development of preventive treatments. Without clear biological targets for intervention, phenotypic high-throughput screening has emerged as a promising approach to identify potential ototoxicity protectants. In the Xu lab, the zebrafish Danio rerio serves as an invaluable resource for studying AG-induced ototoxicity and offers an in vivo model for screening novel compounds that could mitigate these adverse effects.

Rehnaz Karanjia, Alicia Pino, and Alex Bolinger

Subject: Business, Economics & Public Administration

Feedback-Seeking In Remote Work: How Leaders Stay In Touch Without Being In Touch

The shift to remote work has profoundly altered leadership dynamics, particularly in how leaders seek feedback from their teams. While research highlights that leaders who actively seek feedback are more effective, virtual settings have disrupted the casual, in-person interactions that once fostered openness and trust. Without these spontaneous exchanges, leaders struggle to gauge team sentiment, making feedback-seeking both more critical and more challenging. Our research, based on interviews with remote-only supervisors across various industries, explores how leaders adapt their feedback-seeking behaviors in virtual environments. Participants shared their experiences navigating the challenges of remote leadership, revealing how the absence of organic, informal conversations has reshaped their approach to gathering feedback. Our findings reveal that leaders now need fresh feedback approaches—ones attuned to subtle cues that are now infrequent and often limited to formal meetings—since organic conversations that once gauged team morale have diminished. In response, many leaders rely on a combination of careful observation and intentional conversations to assess team sentiment and gather deeper insights. With fewer opportunities for informal feedback, leaders must be more deliberate in monitoring employee engagement, interpreting digital body language, and creating structured yet open channels for dialogue. This study contributes to leadership and organizational behavior literature by demonstrating how remote work reshapes the mechanisms of feedback-seeking. In doing so, it highlights how remote leadership is, in important ways, qualitatively different from in-person leadership, requiring distinct strategies for maintaining trust, engagement, and effectiveness.

Emilee Knapp, Tina Mladenka, Vernon Kubiak, Jody Fowers, and Jennifer Robins

Subject: Education, Learning & Training

Improving Provider Knowledge of The Importance of Patient Education on Potential Mental Health Adverse Effects Associated with Hormonal Contraception

Research suggests hormonal contraception may have mental health side effects. Despite this, professional organizations do not address or acknowledge these risks, leaving many women uninformed. Given the prevalence of these effects, providers should educate patients on potential mental health impacts. The purpose of this project was threefold. First, gather data via an anonymous survey to determine if women aged 18-44 experienced mental health side effects from hormonal contraception. Secondly, to assess if survey participants received education from their provider on possible mental health side effects associated with the use of hormonal contraception. Lastly, information gathered was presented to providers to improve their knowledge of the importance of patient education about potential mental health adverse effects associated with hormonal contraception. Methods: A 12-question Qualtrics survey was developed and approved by the DNP Project team. The survey link was shared via personal social media. Eligibility criteria included women aged 18-44 who had used hormonal contraception. Participation was voluntary and anonymous. Results: A survey of 365 women (ages 18-44) found that most (82%) started hormonal contraception between 18-25, with oral contraceptives being the most common (60%). Mental health side effects were prevalent, including mood swings (24%), irritability (22%), anxiety (20%), and depression (20%). Severe symptoms like self-harm (6%) and suicidal thoughts (5%) were also reported. However, 67% felt uninformed by providers about these risks, and 70% were unaware of management strategies. Mental health concerns led 32% to discontinue contraception. After a provider presentation, 60% were surprised by mental health effects, 80% by poor provider education, and 80% reconsidered patient education. One attendee (20%) became more concerned about self-harm risks. Significance/Implications: The results highlight significant gaps in provider communication and patient education, emphasizing the need for improved counseling practices to better address the mental health implications of hormonal contraception. Ultimately, the goal is for more women to be aware of possible mental health side effects associated with hormonal contraception and avoid poor mental health outcomes.

Jennings Leavell, Kathleen Lohse, Michelle Sclafani, Morgan Barnes, Allison Myers-Pigg, and Sarah Godsey

Subject: Biological & Natural Sciences

Characterizing the effect of a prescribed fire on Phosphorus and sediment biogeochemistry in a montane intermittent stream system

Phosphorus (P) chemical forms in stream systems are likely to vary following the breakdown of organic matter and soil by fire, impacting downstream systems. Yet, P and associated sediment biogeochemical dynamics in burned and intermittent stream systems are understudied due to the episodic nature of these disturbances. A prescribed fire within the Reynolds Creek Experimental Watershed in southwestern Idaho provided a unique opportunity to study P and sediment response to fire disturbance in a montane intermittent stream. Approximately 25% of the sampled sub-watershed burned at a low to moderate severity. Spatially distributed total suspended solids (TSS), stream bed sediments, and water chemistry were sampled in three monthly pre-fire campaigns, three times immediately post-fire at two-week intervals, and three monthly campaigns during spring post-fire, respectively timed to catch seasonal dry-down and post-fire wet-up responses. We hypothesized that the prescribed fire would yield a significant increase in TSS in the stream and a proportional increase in stream total P concentrations, as particulate and colloidal matter are dominant transport vectors of P in aquatic systems. We also expected a shift from a mix of metal- and organic-bound P to proportionally more inorganic calcium- (Ca) and magnesium-bound P

measured by x-ray absorption spectroscopy (XANES) due to the thermal mineralization of organic matter. A low-moderate mixed severity fall prescribed fire does have an immediate impact on stream suspended sediment load in this study, but did not have the expected effect on P concentration. Our unique application of XANES indicates that there is a change in P chemical forms post-fire, favoring inorganic forms of P, although it is also limited. These factors may still affect downstream water quality, and are relevant considerations for the application of prescribed fire in small, montane stream systems.

Hannah Lesnick and Maria Wong

Subject: Humanities, Behavioral & Social Sciences

Risks of Early Marijuana Engagement: The Potential Risks of Depression and Suicidality.

Early onset of marijuana use is linked to an increase in suicidality, though the reason is unclear (Ahuja et al., 2022; Pedersen, 2008; Swahn et al., 2012). The current study sought to examine whether depression mediated the relationship between the early onset of marijuana use (i.e., flower; 0=15 years & older; 1=14 years & under) and lifetime suicidality (ideation, planning, attempt; 0=no; 1=yes) in college students. Data were drawn from ART, an ongoing study on substance use, suicidality, and sleep among college students from Idaho State University. 954 college students (78% female, 87.4% White, mean age = 21.14(5.67)) completed the study. Participants completed questions regarding age of first marijuana use (Cuttler & Spradlin, 2017), depression subscale of the DSM-5 Cross-Cutting Measure (Clarke & Kuhl, 2014), and the Columbia-Suicide Severity Rating Scale (Posner et al., 2011). The findings suggest that early onset of marijuana use (14 years of age & younger) is a risk factor for future suicidality among college students. We will discuss the implications of these findings on prevention and intervention programs of marijuana use and suicidal behaviors. Supported by NIH 5U54 GM104944, Idaho State U. (ISU) Office for Research (LIGC06), and ISU College of Arts and Letters faculty development award (PI: Wong).

Joshua Lindquist

Subject: Humanities, Behavioral & Social Sciences

Cybersecurity Awareness and Scams in the Elderly

According to the FBI, in 2023 elderly victims had losses of $3.4 billion which was an increase of 11% from 2022. These are the reported losses; they do not include those that do not reach out. I seek to establish a baseline with local seniors about their technology use, knowledge and some general cyber security practices and interview a few about their experiences. This is all with the goal to recognize where we may improve protecting this group of people, and where the gaps in their knowledge lie.

Amber Mallet Wrout, Kristy Crownhart, Krystal Gottsman, and Becky Gomez

Subject: Health, Nutrition & Clinical Sciences

Provider Adherence to American Heart Association Cholesterol Guidelines

This project aims to assess primary care providers' adherence to the 2018 American Heart Association Cholesterol Guidelines and implement an atherosclerosis cardiovascular risk score tool within the electronic health record to increase antihyperlipidemic agent prescribing in eligible adults. Hyperlipidemia leads to conditions like myocardial infarctions, ischemic strokes, and peripheral vascular disease. It is estimated that around fifty percent of the population in the United States has elevated low-density lipoprotein (Hill & Bordoni, 2023). A retrospective chart review was completed on patients admitted to the hospital for myocardial infarction to assess if their cholesterol was appropriately managed at the time of admission. After the chart review, an email was sent to primary care providers at Saint Alphonsus. The link included a pre-survey, an educational PowerPoint on the digital atherosclerosis cardiovascular disease risk score tool, resources to help follow the guidelines, and a post-survey. Providers reported that after reviewing the

educational PowerPoint, they would utilize the digital atherosclerosis cardiovascular risk score tool available in the electronic health care system more often. The project also revealed that calculating the risk score helps providers follow the 2018 American Heart Association Cholesterol Guidelines more frequently. Increasing awareness of the digital atherosclerosis cardiovascular disease risk score tool directly influences how providers manage their patients. Therefore, having educational resources that guide providers on how to use these tools can increase compliance with the 2018 American Heart Association's Cholesterol Guidelines.

Alleyna Martes, Leticia Herrera, and Michele Brumley

Subject: Humanities, Behavioral & Social Sciences

Recovery in Motion: Neuroplasticity and Spinal Cord Injury

Spinal cord injuries (SCI) often result in sensory and motor dysfunctions due to the disruption of neural circuits affecting the communication between the spinal cord and the brain. The most common type of SCI in humans is an incomplete injury, where the spinal cord is partially damaged. Less common, but more severe, is the complete spinal cord injury which results in the spinal cord being wholly transected. Researchers use the transection model to examine the effects of the isolated spinal cord. When a transection occurs, the brain is unable to transmit signals to the area below the lesion. However, there is capacity for recovery. Neuroplasticity is a remarkable feature of the nervous system that is crucial for recovery after neural injury. Various factors can impact neuroplasticity after injury, including age, activity levels, and environmental variables. Immediate, intensive interventions are necessary to mitigate the detrimental effects of SCI. Research at each level –cellular, systems, behavioral, and therapeutic– is ongoing and provides insight to different aspects of recovery capacity. Our lab uses an early developmental model in which rats undergo a spinal cord transection surgery on postnatal day (P)1. Depending on the focus of each project, interventions such as treadmill training or alteration of maternal care behavior are applied. Behavioral testing such as spontaneous locomotion and reflex function then occurs at various developmental stages. The overarching goal of this research is to examine factors that influence neuroplasticity within the isolated lumbar spinal cord. This is one vital piece of the complex and multifaceted goal of promoting recovery after spinal cord injury.

Marie Martinez, Kristina Blaiser, Miranda Nelson, Lesa Coleman, James Fritzler, and Kat Ross

Subject: Education, Learning & Training

Proposing Metrics for a Unique Model of DHH Family Engagement

Family involvement and engagement leads to improved outcomes of children who are identified with hearing differences (Henderson et al., 2016; Moeller et al., 2013; Calderon, 2015). The Early Hearing Detection and Intervention (EHDI) systems have been tracking dates for identification of hearing loss, family enrollment within the early intervention (EI) systems and, more recently, efforts to track child language outcomes. However, metrics related to family engagement and family support can be difficult to effectively quantify and, therefore, are not currently tracked on an ongoing basis, This presentation will discuss how Idaho is working as a system to develop metrics to record and track aspects of family support and engagement such as frequency of support, duration in the program, and comparisons of referral rates to family enrollment. We will be sharing a pilot of how family support can be tracked and how this data might be effectively captured in a scale measuring synchronous and asynchronous family engagement. These measurements can be used to assess the relationship between family support and engagement with academic and language outcomes.

Jacob McMillin

Subject: Health, Nutrition & Clinical Sciences

Community Movie Screening: Assessing Advance Care Planning Readiness

The medical care that people receive near the end of life is often different then the care that they desire (Yadav et al., 2017). This can lead to the use of burdensome treatments that can cause unnecessary suffering for both the patient and family, while simultaneously increasing health care cost (Yadav et al., 2017). The majority of Americans (63.3%) do not have an advanced directive (Yadav et al., 2017). This leaves the medical decision making in the hands of family or a health care provider that does not know the patient's wishes. Often when tasked with being a surrogate decision maker, these family members experience emotional distress (Nouri et al., 2021). Advanced care planning helps individuals share with their family and providers their identified values, goals, and preferences for future medical care (Nouri et al., 2021). When the participants arrived at the event, they were given a pre-survey. This survey included the 9-item advance care planning survey and also had questions to gather demographic information including age, gender, marital status, zip code, race/ethnicity, and education level. After the participants had completed their pre-survey and the surveys had been collected, the movie "Tuesdays with Morrie" was shown. After the movie a short presentation (10-15 minutes) about advanced care planning was completed. Following this a post-survey was completed and collected. After comparing the pre and post surveys a p-value of less than 0.05 was observed, indicating that the result is statistically significant. In conclusion, the findings suggest that advanced care planning interventions increased participants' understanding and awareness of advanced care planning. This highlights the importance of such interventions in promoting informed decision-making. These efforts can potentially reduce unnecessary suffering, alleviate emotional distress for family members, and lower healthcare costs.

Whitney Miller and Kristina Blaiser

Subject: Health, Nutrition & Clinical Sciences

Caregivers' Perspectives on Communication Modality Counseling for Children with Hearing Differences

Communication modality and/or language use is a primary focus after the diagnosis of a hearing loss. Ideally, early intervention professionals provide this counseling and give caregivers' unbiased, comprehensive information about different communication modalities in order to make an informed decision for their family. Currently, there is no consensus regarding who provides this counseling and the content of information provided. To gauge caregivers' satisfaction with their communication modality counseling experience, we designed a survey for caregivers of children with hearing loss. The survey aims to gather valuable insights into parental experiences regarding the content, quantity, and feelings surrounding the communication modality counseling received. By understanding parental perspectives, the survey seeks to contribute to improved decision-making for caregivers regarding their chosen communication modality and enhanced service provision by identifying specific room for improvement in the counseling process. Forty-eight people responded to the survey. Results show there is a lack of consistent practice in communication modality counseling among early intervention professionals. Discussions held at the optimal time are linked to a more favorable emotional response and greater perceived adequacy of information, thereby enhancing caregiver preparedness. In contrast, delayed or absent discussions may contribute to continued uncertainty and negative emotional outcomes. Overall, findings show a lack of consensus amongst early intervention providers about responsibility, content, and timing of communication modality counseling. Interprofessional collaboration needs to be enhanced and prioritized for effective, family-centered care. Consideration should be given to iterative counseling to support family comprehension. Although we have gleaned valuable information from this study, more research is needed on the topic of communication modality counseling.

Skyler Moa, Robert Houghton, and Chris Healy

Subject: Business, Economics & Public Administration

Economic Trends & Cyber Operations (2019–2024)

The intersection of economic impact and cyber conduct is ever more a norm of 21st-century global security. The essay below is a description of the way national GDP forecasts from 2019 through 2024 shape the cyber policies of major global powers, the United States, China, Russia, Iran, and North Korea. Wealthier states use cyber power mainly for defense and intelligence, while economically strained or sanctioned states use more cybercrime and disruptive attacks as asymmetrical instruments. The report cites general trends such as China's concentration on cyber espionage for economic and technological advancement, Russia's use of cyber activity for geopolitical power, Iran's launching of cyberattacks in response to economic sanctions, and North Korea's reliance on state-sponsored cybercrime as a consistent source of income. Large-scale cyber attacks such as the NotPetya attack, the Microsoft Exchange hack, and North Korea's cryptocurrency robberies provide case studies on how economic conditions drive national cyber agendas. The research concludes that economic hardship is linked with more assertive and economically motivated cyber behavior, and prosperity permits sophisticated cyber capabilities in pursuit of geopolitical and technological dominance. Since the economic cost of cybercrime is projected to be $10.5 trillion a year by 2025, it is important that economic policy and international coordination are incorporated into cybersecurity systems.

Spencer Moore, Rachel Sutherland, Nyx Call, and Kirsten Mink

Subject: Humanities, Behavioral & Social Sciences

Building a Virtual Skeleton: Preservation of Human Skeletal Remains through Digitization at ISU

The digitization of human skeletal remains through 3D scanning offers a transformative approach to research, education, and forensic anthropology. This project utilizes 3D scanning and processing techniques to create a high-resolution digital database of the anatomical human skeletal collection at Idaho State University. By developing a virtual repository, this initiative preserves the physical collection in a non-invasive manner while enhancing its research potential. The scanning process involves the use of a FARO Edge Laser ScanArm to capture detailed surface data of each skeletal element. The collected point cloud data is then processed using PolyWorks software to generate precise 3D models. These digital representations provide a valuable resource for osteological analysis, comparative studies, and forensic applications. Preliminary results demonstrate the effectiveness of 3D scanning in preserving fine anatomical details, allowing for accurate digital documentation of skeletal morphology. This approach mitigates the risks associated with handling fragile remains and facilitates interdisciplinary research. Additionally, digitization offers ethical benefits by providing a respectful and sustainable method for preserving and studying human remains. By reducing the need for repeated physical handling, 3D models minimize degradation while still allowing for detailed analysis. Furthermore, digital preservation expands opportunities for education and research while ensuring that collections can be accessed responsibly and equitably. By integrating advanced technology with anthropology, this project underscores the potential of 3D scanning in modern skeletal analysis while promoting ethical stewardship of human remains. Future work will focus on expanding the database and refining best practices for digital curation. This initiative marks a significant step toward the responsible preservation of human skeletal collections, ensuring their continued utility for scientific inquiry and education.

Mick Morgan and Cory Bennett

Subject: Education, Learning & Training

Shaping Mathematical Identity: How Reasoning-Based Discourse Empowers Student Mathematicians

Developing students' mathematical identity is central to their success in doing mathematics (Aguirre et al., 2013). Part of one's mathematical identity is how they see themselves and how others view them in relation to doing mathematics. The purpose of the larger project was to better understand how a reasoning-centric discourse protocol helps students develop mathematical behaviors for constructing and critiquing mathematical arguments. The primary focus was to understand students' initial mathematical identities, their interpretations, and descriptions of a mathematician, as evident in their drawings of mathematicians. An exploratory qualitative case study design (Bogdan & Biklen, 2007) was used as it allowed the university researcher and teacher-researcher to explore students' discourse-identity relationship in an authentic and natural context and develop initial understandings of how such interactions influence students' perceptions of themselves and what it means to be a mathematician and do mathematics. Initial drawings from 18 students revealed that 14 depicted mathematicians as men, three as women, and one as a family due to unfamiliarity with the term "mathematician." Notably, none portrayed a child as a mathematician. In contrast, the second drawings more accurately reflected the students' own gender and age, with only one girl drawing a male figure. Additionally, students began identifying themselves as mathematicians, with one explicitly writing, "I drew myself because I feel more confident in math than last time." This suggests that students are beginning to see themselves, people their own age and gender, as mathematicians. Findings suggest that reasoning-based discourse can positively influence students' self-perception as mathematicians. The collaboration between the teacher-researcher and a university researcher played a crucial role in fostering this shift, highlighting the impact of intentional discourse and inquiry in shaping students' mathematical identities.

Kaylin Muller, Aubrey Fuchs, and Steve Lawyer

Subject: Humanities, Behavioral & Social Sciences

Delay discounting for sexual activity and money and their relationship to sexual risk behaviors in college students

Delay discounting (DD) is the tendency to devalue a reward or outcome based on the delay to receiving it and is a critical variable in understanding the psychological factors that underlie health risk behaviors. DD is traditionally measured by offering participants a choice between a smaller immediate reward (e.g., $5 NOW) and a larger reward (e.g., $10) available after a series of delays (e.g., 1 day, 1 week, 1 month). Recent research has adopted a commodity-specific approach to understanding DD in relation to non-monetary outcomes such as sexual activity, and DD for specific commodities often predict commodity-specific health outcomes such as sexual risk behavior better than money (Lawyer & Schoepflin, 2013). The current study explores the relationship between monetary and sexual activity delay discounting and sexual risk behaviors. Using an online survey, female-identifying undergraduates (n = 192) at a university in the Mountain West region completed a battery of surveys, which included behavioral tasks that assess DD for money and DD for sexual activity. Correlational analyses examined the relationships between rates of DD for monetary and sexual activity in relation to reported sexual risk behaviors. The results revealed that frequency of past-six-month sexual risk behaviors was positively associated with both DD for money (r = .147) and for sexual activity (r = .256) with a larger correlation to sexual activity. Specifically, individuals who exhibited steeper discounting for both monetary and sexual rewards were more likely to report engaging in higher levels of sexual risk behaviors.These findings suggest that individuals who devalue delayed rewards, both in monetary and sexual contexts, may be more inclined to engage in behaviors that involve greater risk. This study contributes to our understanding of how delay discounting may serve as a predictor of risky sexual

behaviors and highlights the importance of considering commodity-specific delay discounting in future research on decision-making and risk behavior.

Costain Nachuma, Md Mosharaf Hossan, Asif K. Turzo, and Minhaz F. Zibran

Subject: Engineering, Physical & Mathematical Sciences

Assessing Security Risks in Software Dependencies: A Quantitative Study of the Maven Ecosystem

Modern software development relies on third-party dependencies which not only improve efficiency but also introduce security risks. The Maven Central Repository, widely used for Java applications, is vulnerable to direct and transitive security flaws, with transitive risks often overlooked. These hidden vulnerabilities can spread across multiple dependencies posing significant threats. This study examines security risks in the Maven ecosystem, identifies high risk dependencies and assesses their impact. The goal is to highlight major security concerns and provide insights for better software protection whilst benefiting from software reuse. Utilizing data mining techniques, this research utilizes the Goblin framework, a Neo4j-based dependency graph which integrates security metadata for over 658,000 artifacts and 14.4 million releases. The study involves mapping Common Vulnerabilities and Exposures (CVEs) to artifacts, assessing Common Weakness Enumeration (CWE) frequency, severity, and impact, and analyzing how security flaws spread through dependency hierarchies. Additionally, graph traversal techniques are leveraged to compute dependency risk scores and assess the proportion of affected artifacts. We find that 62.89% of vulnerabilities in Maven releases stem from transitive dependencies, while 31.39% originate from direct dependencies, making mitigation complex. Poor session management (CWE-6) and uncontrolled resource allocation (CWE-770) amplify risks. Authentication flaws and unencrypted sensitive data are rising threats. Only 35.04% of latest releases are vulnerability-free, urging proactive security strategies, stronger dependency governance, and automated detection tools to combat hidden security flaws in the ecosystem. The results emphasize the critical need for proactive security measures in dependency management. Since transitive vulnerabilities often remain undetected by conventional security tools, improving automated security assessments is essential for reducing software risks. Future research should focus on developing advanced vulnerability detection techniques and fostering collaborative security strategies in open-source ecosystems. Addressing these challenges will strengthen software security and help mitigate risks associated with dependency vulnerabilities.

Christopher Nicolet, Elizabeth Kara, and Danny Xu

Subject: Health, Nutrition & Clinical Sciences

In silico Guided Modulation of Mechanotransduction Channels in Zebrafish

Aminoglycosides are valuable for treating multi-drug-resistant gram-negative infections often reserved for severe conditions like sepsis, endocarditis, and complicated intra-abdominal infections. However, up to 20% of patients experience permanent hearing loss or balance disturbances, with toxicity accumulating over continued use. Despite this debilitating side effect, there are currently no FDA-approved therapies to prevent aminoglycoside-induced ototoxicity. As a result, there is great interest in discovering agents that can mitigate or prevent drug-induced hearing loss. Although the molecular mechanisms behind aminoglycoside ototoxicity remain unclear, evidence suggests that aminoglycosides enter hair cells primarily through mechanoelectrical transduction (MET) channels. By leveraging C. elegans TMC structures and AlphaFold 3-predicted models, we aim to characterize MET channel binding sites and identify novel compounds that block aminoglycoside entry to prevent ototoxicity using the in vivo zebrafish model. Initial pharmacophore-based virtual screening of the NCI database identified 1,028 compounds resembling known MET channel blockers. Docking analyses averaged across the three TMC paralogs resulted in 40 compounds selected for testing, 19 of which disrupted FM1-43 uptake, with three protecting against

gentamicin-induced hair cell damage. These results highlight the effectiveness of combining AlphaFold structural predictions with high-throughput virtual screening to identify compounds that modulate therapeutic targets. Further studies, including long-scale molecular dynamics simulations and expanded chemical screening, are needed to elucidate the mechanisms of lead compounds capable of preventing drug-induced hearing loss.

Anyauba Nmaju and Sarah Hobdey

Subject: Health, Nutrition & Clinical Sciences

Characterizing a new therapeutic strategy for the treatment of necrotizing soft tissue infections caused by group A streptococcus

The resurgence of Group A Streptococcus (GAS) infections has increased the incidence of necrotizing soft tissue infections (NSTIs) a disease with few therapeutic options. This disease is mediated by multiple toxins including streptolysin O (SLO), a cholesterol-dependent cytolysin that causes necrosis and ischemia making it a viable therapeutic target. We have developed three very specific and highly neutralizing anti-SLO human monoclonal antibodies (huMAbs) as potential therapeutics. Despite similar neutralization of SLO in vitro, these huMAbs exhibit varying levels of protection in a murine model of GAS-NSTI. This research aims to elucidate the reason for these discrepancies, and we hypothesize that the unique SLO epitopes mediate the differences in efficacy To test our hypothesis, a thorough analysis of the immunoreactive SLO epitopes will be conducted using experimental and computational methods. Next, we will investigate whether the location of the epitopes contributes to the huMAbs' ability to neutralize SLO in the presence of other GAS toxins, specifically if full-length huMAb is needed for complete neutralization. Finally, to understand if huMAb efficacy is mediated by its innate properties rather than its unique interaction with SLO, we will computationally and experimentally assess their biophysical, pharmacokinetic, and pharmacodynamic profiles When completed these studies will provide us with a more complete understanding of why similarly neutralizing anti-SLO huMAbs in vitro, have differing efficacies in vivo and support the development of effective first toxin-neutralizing therapeutics for the management of GAS-NSTI.

Abigael Ntwal Mukaz, Jessica Chiapa, Jeremy Russell, Michelle Velazquez, and Erika Fulton

Subject: Humanities, Behavioral & Social Sciences

Does Caffeine Improve Your Reading Comprehension and How Well You Evaluate Your Performance?

Caffeine consumption is widespread and its cognitive effects—particularly on attention, alertness, and reaction time—have been considerably studied from a pharmacological viewpoint. However, there is no existing literature on caffeine's impact on metacomprehension--how well people judge their reading comprehension--despite its relevance to daily decisions made at school and work. Using a randomized, double-blind study, we administered either a caffeinated or non-caffeinated orange drink to a sample of 115 ISU students and assessed their arousal levels, caffeine consumption habits and dependency, beliefs about caffeine's effects on cognition, reading comprehension, and metacomprehension monitoring accuracy. The effect of caffeine, caffeine habits, and caffeine expectancies on metacomprehension monitoring accuracy will be discussed. Our findings have implications for caffeine users and non-users making decisions about whether to consume caffeine for cognitive benefits.

Jordan Oman, Seyedeh Melika Akaberi, Pooja Sapkota, Sabina Yeasmin, Kavita Sharma, Marvin Schulte, and Srinath Pashikanti

Subject: Health, Nutrition & Clinical Sciences

Development of L-Ascorbic Acid Analogs as Biological Probes for Hearing Loss Therapy

Nicotinic acetylcholine receptor (nAChR) α9 and α10 subunits are mainly expressed in hair cells of the inner ear and are involved in auditory processing. Recently L-ascorbic acid (ASC) has been identified as a positive allosteric modulator (PAM) for α9α10 nAChR. While ASC is commonly known for its role as an antioxidant, critical cofactor, and free radical scavenger, its properties as a PAM of α9α10 nAChRs have yet to be investigated. The development of more selective PAMs of the receptor will aid in understanding the role of this receptor in auditory processes. ASC is a polyhydroxylated chiral synthon that is subject to various chemical methodologies. Synthesis of ASC analogs will investigate the role of H-bond with receptor binding and potentiation. The importance of the vinylogous system will be explored with lipophilic and hydrophilic substitutions to affect potency and identity of the pharmacophore. Synthesized analogs will be used to create a library of compounds for classical structure-activity relationship (SAR) studies to probe the active site of the α9α10 nAChRs for biological activity. Additionally, chiral pool synthesis will be used to develop enantiopure compounds that mimic ASC's butenolide scaffold. A library of compounds was synthesized for screening on the α9α10 nAChRs. Initial screening of the α9α10 nAChRs was performed with two electrode voltage-clamp (TEVC) methods. Screening of ASC analogs has helped determine the pharmacophore for retaining biological activity and increasing potency. Initial results from ASC analogs are promising for hit-to-lead development. Compounds synthesized retain efficacy while increasing potency for the receptor. The development of more compounds for this receptor is important to be able to understand ASC's potentiation of nicotinic receptors and other biological processes.

Aney Paul and Farjana Eishita

Subject: Engineering, Physical & Mathematical Sciences

Google Drive Storage Management

Google Drive is a robust cloud-based storage platform that enables file sharing, access, and storing from any location. We consider Google Drive to be a convenient way to share files such as documents, pictures, and videos. As it occupies space after sharing files with others, we need to remove shared files for managing storage of Google drive. Removing shared files from one's Google Drive along with the device before the receivers have downloaded them is a frequent problem that results in data loss for the secondary users. In this study, we introduce a noble approach to resolve this situation by developing a web application that allows users to set deletion times for their shared files on Google Drive. This feature will automatically delete the files after the scheduled time. In addition, there will be a notification system that enables the primary user to schedule an email notification for secondary users. According to the set time, email alerts will be sent to secondary users providing the time when a file is about to be deleted so that they don't forget to download the shared files before the auto-deletion time. We conducted between subject design for our experiment and observed that almost all users downloaded their files after receiving email alerts. This study aims to investigate how Google Drive's file-sharing management and the problem of forgotten or missed downloads can be enhanced by automating file deletion and email notification systems.

Drew Perry

Subject: Engineering, Physical & Mathematical Sciences

A Case Study in Cybersecurity Policy of Self-training LLMs via RAG Dataset Production

Large Language Models (LLMs) have been rapidly gaining prevalence in our society. However, most models aim to be broadly adept at tasks rather than specializing in any one particular area. I aim to fine-tune a smaller general model to be more knowledgeable on US cybersecurity guidelines, namely the NIST SP 800

series. However, fine-tuning requires an extensive dataset of questions and responses. To this end I will first use the more general, original model, providing it the texts of the SP 800 series, in a Retrieval Augmented Generation (RAG) configuration. This is normally done to be able to query a corpus of documents and receive a natural response with current information. However, I will use this RAG model to instead generate the necessary dataset of questions and responses necessary to fine-tune the model. Thus the model will be responsible for its own input, training itself to be more proficient in cybersecurity guidelines and policy. Rather than simply training on artificial responses, these responses will be able to directly pull from the documentation, ideally keeping the model from hallucinations. Resources and research is scarce in combining RAG and fine-tuning in such a way (they are generally seen as largely independent methods). Responses to specific questions asked of this model and other standard LLMs will be ranked in preference by cybersecurity professionals to determine if this finetuning has successfully integrated cybersecurity knowledge into the LLM.

Mahnaz Poorshahidi

Subject: Humanities, Behavioral & Social Sciences

Learning as Liberation: Resisting Religious Colonialism Through Education

This paper explores how religious colonialism is applied as a tool to gain autonomy and control over women in Middle Eastern and African Islamic countries. Unlike traditional colonialism in which one nation imposes its power on another, religious colonialism works from within; employing religious beliefs and faith to reinforce patriarchal authority. Women in these societies face severe constraints, such as mandatory dress codes, male guardianship laws, cultural and social pressures, and restraints that keep them submissive. Education plays a crucial role in keeping women in the position of submission. Based on the notions of bell hooks and Paulo Freire, this study demonstrates how schools in these countries choke critical thinking, particularly for women, to maintain their power dynamics. In extreme cases, like in Afghanistan being controlled by the Taliban, girls are denied education since knowledge threatens the system of domination. When women are enlightened and gain knowledge, they begin to question, resist, and demand change which is what can shatter and demolish the foundations of these patriarchal and colonial structures. Additionally, education can function as resistance. Inspired by feminist and postcolonial theories, this paper underscores how acquiring knowledge can empower women and help them break free from oppression. When women are educated, they do not just uplift themselves; they reshape their families and change the structure of society. In the end, this paper argues that change happens through changing minds and not changing laws. The more women are empowered through reading, the less control these oppressive systems will have over them. Education is not just a tool, but a revolution on the verge of happening.

Md Fazle Rabbi, Rajshakhar Paul, Arifa Islam Champa, and Minhaz Zibran

Subject: Engineering, Physical & Mathematical Sciences

From Discovery to Fix: The Journey of Software Vulnerabilities

The extensive use of third-party libraries in modern software development introduces significant security risks, as vulnerabilities in these libraries can spread throughout ecosystems. The Maven ecosystem, which heavily depends on external libraries, faces challenges in managing these vulnerabilities. Despite using CVE and CWE frameworks, delays in documenting and resolving vulnerabilities leave software users exposed to ongoing risks. We use the Goblin framework, a Neo4j-based dependency graph of the Maven Central repository, to analyze 77,393 vulnerable releases tied to 226 unique CWEs. The dataset includes timestamps for releases and CVE publication dates, enabling analysis of documentation delays and resolution timelines. Our research investigates three key questions: the most frequent CWEs, the duration vulnerabilities remain undocumented, and the time taken to resolve them. Our analysis shows that vulnerabilities are concentrated in a few CWEs, particularly deserialization (CWE-502) and cross-site scripting (CWE-79). On average,

vulnerabilities take 5.95 years to be documented and 4.4 years to be fixed. While known vulnerabilities are rarely deployed in releases, a significant proportion of vulnerabilities remain unresolved, with some staying unfixed for over a decade. This study highlights the issue of delayed documentation and resolution of vulnerabilities in the Maven ecosystem. It shows the need for quicker identification, documentation, and fixing of vulnerabilities to reduce the security risks from third-party dependencies.

Makenzie Reed, Anna Jirik, Beverlly Victoria-Bolivar, Claire Wasniewski, Anthony Hinders, Katrina White, Rochelle VanDeren, Lincoln Oldham, and Devaleena Pradhan

Subject: Biological & Natural Sciences

The confluence of social behavior, genitalia morphogenesis, and hormonal profiles during male to female sex change in the bluebanded goby, Lythrypnus dalli

Sex dynamic species are valuable model systems that allow us to naturally recapitulate the development of sex organs and sex variable traits in reproductively mature individuals. Bluebanded gobies, Lythrypnus dalli, are sexually plastic marine fish that live in dominance hierarchies consisting of one dominant male and multiple subordinate females. Divergence from this sex ratio results in competition for re-establishment of social status. Within minutes of social disturbance, fish exhibit increased aggression intensities and sex-specific behaviors to gain and maintain status. Through a novel longitudinal study investigating protandrous (male to female) sex change, we discovered that female-typical solicitation behavior emerged in the transitioning individuals 14 days post-social disturbance. Transitioning individuals were subordinate to the nesting male fish and were dominant to the stimulus female. The reorganization of the external genitalia involved the morphogenesis of the width at the tip of the genital papilla, which changed from being conical and pointy for sperm release to truncated and wider for egg release. This took longer and was more variable compared to female to male sex change. Levels of systemic testosterone followed a similar pattern throughout the study in all fish, while 17beta-estradiol levels increased over time in the transitioning fish. We visualized the complexity of the morphological, hormonal, and behavioral changes across the longitudinal period of sex change using multi-variate analysis. Transitioning fish overlapped in male and female niche spaces across multiple time points, but by the final day of study, transitioning fish and female fish shared the same niche space. This study is foundational for understanding of mechanisms involved in the initiation and patterning of feminization of multiple traits manifesting at different rates. Organisms that change sex exist in a spectrum of phenotypes that are in a state of flux and over time, become fixed into the new discrete sex.

Blair Richlin

Subject: Health, Nutrition & Clinical Sciences

Pediatric Hearing Healthcare Roadmap

Ensuring timely follow-up and adherence to newborn hearing screening (UNHS) recommendations is critical for early diagnosis and intervention in infants who are deaf or hard of hearing (DHH). However, caregivers often face challenges in navigating the complex pediatric hearing healthcare system, which may contribute to delays in care, increased stress, and loss to follow-up. Caregivers of infants in the Neonatal Intensive Care Unit (NICU) and Special Care Nursery (SCN) may experience additional barriers due to the medical complexity of their child's condition. This study aims to evaluate the feasibility and effectiveness of a visual roadmap designed to improve caregiver comprehension, reduce stress, and enhance adherence to follow-up appointments within pediatric hearing healthcare. This randomized controlled trial will enroll caregivers of infants referred for follow-up testing after UNHS at Massachusetts Eye and Ear. Participants will be randomly assigned to receive either a visual roadmap (intervention) or standard text-based materials (control). Caregiver stress will be measured using the Parenting Stress Index – Short Form (PSI-SF) at baseline and follow-up appointments. Caregiver comprehension will be assessed through structured

clinician-administered questions, while adherence will be evaluated based on appointment attendance and compliance with pre-appointment instructions for auditory evoked response (AER) testing. Additionally, time-to-appointment intervals will be analyzed to assess whether the visual roadmap facilitates timelier follow-up. Statistical analyses will include independent t-tests, Chi-square tests, logistic regression, and repeated-measures ANOVA to examine differences in caregiver stress, comprehension, and adherence between study groups. By addressing barriers to caregiver engagement and adherence, this study seeks to inform best practices for supporting families navigating pediatric hearing healthcare and contribute to strategies that optimize early intervention outcomes for infants who are DHH.

Juergen Riedelsheimer and Lawrence Behmer

Subject: Humanities, Behavioral & Social Sciences

Modes of Communication During a Joint-Rhythm Task Modulate Cognitive Control Resources.

COVID-19 lockdowns posed extraordinary challenges as most schools transitioned to remote learning, yet how online education affects cognitive demands remains unclear. To investigate how different Modes of Communication (MoC) affect cognitive control and stress, we had participants synchronize quarter-note sequences with an adaptive Virtual Partner (VP), a computer program to simulate a human partner by adjusting its response to the participant's performance, in three conditions: face-to-face (synchronous), synchronous online via Zoom or asynchronous via pre-recorded video. We recorded EEG to examine theta-band activity, a neural correlate of cognitive control, while we collected pre- and post-task saliva samples to assess cortisol levels as an index of physiological stress. Results showed greater theta activity in the face-to-face group compared to both video-based conditions. From a behavioral perspective, participants in the face-to-face condition demonstrated the most stable synchronization, whereas those in the Zoom condition showed the highest asynchrony, suggesting greater variability in participants' timing. Cortisol analysis revealed a significant reduction in stress levels across all conditions, with the face-to-face group showing the most pronounced decline, indicating that direct social interaction may play a key role in stress regulation during joint rhythmic tasks. These findings suggest that face-to-face interactions engage more cognitive control, but the effect remains modest. Factors such as task complexity or the VP's adaptive agency might have contributed to the observed EEG and behavioral patterns. Although rhythmic synchronization contributes to stress reduction, this effect was consistent across synchronous and asynchronous conditions, suggesting that rhythmic synchronization, rather than MoC, contributed to these differences. Future research should disentangle the mechanisms underlying cognitive control and stress regulation in different MoCs to better understand their role in engagement and stress regulation in educational settings, as these factors influence cognitive resources and, ultimately, learning outcomes.

Sadman Sakib and Maimuna Zaman Alvi

Subject: Humanities, Behavioral & Social Sciences

Shaping Climate Discourse: A Comparative Study of Media Narratives Across National Contexts

This study aimed to analyze the coverage of climate change by major newspapers in Bangladesh and the United States, focusing on a comparative analysis of media discourse to identify similarities and differences in framing climate change between developing and a developed nation.This paper investigates dominant and secondary frames and tone of climate change news for one year using Framing Theory and Media Ecology Theory. 1276 climate news stories from a major Bangladeshi newspaper (Prothom Alo) and 1,257 from a prominent American newspaper (The New York Times) were subjected to qualitative framing analysis over a year. The analysis encompasses meticulous coding of textual data to uncover prevalent themes and prominent frameworks. Important areas of focus encompass vulnerability and resilience, policy and governance, technological solutions, and socio-economic impacts. The coding process integrates both

deductive and inductive methodologies, employing established framing categories while also accommodating the emergence of new themes. A comparative analysis is performed to uncover patterns and differences between the two nations, concentrating on the tone, emphasis, and rhetorical techniques employed in the coverage of climate change. The analysis of tone meticulously examines how articles portray climate change narratives, categorizing them as positive (highlighting solutions or innovations), negative (focusing on risks or failures), or neutral (offering balanced perspectives). The examination further explores the contextual factors that shape these frames, including the varying degrees of climate vulnerability in Bangladesh and the United States' position as a global leader in climate policy. The findings explore the parallels and distinctions in climate change framing, emphasizing the impact of cultural, political, and socio-economic elements on media portrayal. Differences in national priorities and climate vulnerability shape how the media construct public discourse and policy engagement. Understanding these differences can provide valuable insights into how media shape public perception, influence policy debates, and drive climate action in diverse national contexts.

Taiwo Salako

Subject: Humanities, Behavioral & Social Sciences

Nigerian English: Deviation or Variation?

English is widely considered the most prominent language in the world, both in terms of the number of speakers and its global importance. As a result, different versions of English, known as “New Englishes,” have emerged in various parts of the world. This research examines Nigerian English’s history and explores whether it should be seen as a deviation from or a variation of Standard British English. This research analyzes Nigerian English vocabulary, syntax, semantics, idioms, and phonology using Banjo and Brosnahan’s (1958, 1971) linguistic frameworks and Adegbija’s (2004) classification. The research found that Nigerian English shares key features with Standard British English, such as its alphabet, spelling, and morphology. However, the influence of Nigeria's indigenous languages has shaped its grammar, pronunciation, idioms, and vocabulary, becoming a nativized variation of Standard British English. Finally, the study concludes that Nigerian English is a legitimate variety of British English rather than a deviation, making it one of the many “New Englishes” spoken across the globe.

Pooja Sapkota, Melika Akaberi, Jordan Oman, Sabina Yeasmin, Shrinath Pashikanti, Solomon Zeleke, Kavita Sharma, and Marvin Schulte

Subject: Biological & Natural Sciences

Positive Allosteric Modulators (PAMS) of α9α10 nicotinic acetylcholine receptors (nAChRs) for the treatment of hidden hearing loss

More than 1.5 billion people live with hearing loss and the global burden of this disease is expected to surpass 2.45 billion people by 2050. The α9α10 nAChR has been identified as a major target for new drug discovery in this area. α9α10 nAChRs are present in the outer hair cells of the inner ear where they form a part of the Medial Olivocochlear (MOC) efferent pathway that synaptic transmission between efferent olivocochlear fibers and outer hair cells. There are no approved pharmaceutical therapies for the treatment of hidden hearing loss. This project aims to discover first-in-class therapies for the treatment of hidden hearing loss. Other aims of this research consists of development of a soluble α9 receptors for high throughput screening and identification of binding sites for PAMS discovered in this study. We have employed electrophysiological technique to study α9α10 nAChR positive allosteric modulators using receptors expressed in Xenopus laevis oocytes. These assays allow for functional identification of potentiation or inhibition of test compounds. Binding kinetics will be evaluated using novel alpha9 receptor binding kinetics and Surface Plasmon Resonance. We have also evaluated existing PAMs active at other nicotinic receptors (α7 and α4B2) to identify other lead molecules as α9α10 nAChR PAMs. The binding sites

for PAMS will be evaluated by ligand docking in a 3D model of $\alpha 9\alpha 10$ nAChR built through homology modeling utilizing Schrodinger's molecular modeling suite and AlphaFold3. 3-O-propargyl acetonide L-ascorbic acid and 3-O ethyl L-ascorbic acid display significantly enhanced potency over ascorbic acid and are improved candidate compounds for drug development and subsequent clinical trials aimed at treating hidden hearing loss.

Janhabee Shrestha and Solomon Zeleke

Subject: Health, Nutrition & Clinical Sciences

Towards Selective Inhibition of Cyclin Dependent Kinase 11 for Cancer Therapy

In mammalian cells, CDKs are important regulatory enzymes that control essential cellular processes such as cell proliferation and transcription. Dysregulation of CDKs or their associated cyclin partners often leads to uncontrolled cell proliferation, genomic instability and chromosomal abnormalities. CDK11, a nuclear serine/threonine kinase of the CDK family, is a critical but underexplored regulator of transcription, RNA splicing, and cell cycle progression. CRISPR-Cas9 or RNAi-mediated CDK11 knockout studies have shown that CDK11 is crucial for cancer cell survival, with its suppression reducing viability, proliferation, and migration while triggering cell death. Clinically, elevated CDK11 expression in tumor tissues correlates with poorer overall survival rates in cancer patients. These findings underscore CDK11 as a promising therapeutic target, with small molecule inhibitors offering a potential strategy to curb its activity and impede cancer progression. The primary objective of this project is to identify selective CDK11 inhibitors by integrating high-throughput virtual screening, medicinal chemistry, and structure-based drug design strategies. Our approach involves designing and synthesizing novel compounds with high specificity for CDK11 inhibition. These compounds are refined through hybridization, simplification, and structural modifications to improve their potency, selectivity, and drug-like characteristics. We use radiometric kinase assays to quantify CDK11 inhibitory activity. In addition, the antiproliferative potential of the synthesized compounds is evaluated using the MTT assay, providing insight into their therapeutic potential. We synthesized a series of compounds, some of which showed promising CDK11 inhibition. Notably, two compounds exhibited over 90% inhibition at a concentration of 10 μM. These encouraging findings suggest the potential for further refinement. Our current efforts focus on optimizing these lead compounds using medicinal chemistry strategies to improve their potency and selectivity. By combining computational and experimental methods, this project aims to develop highly selective CDK11 inhibitors with enhanced pharmacological properties for potential therapeutic use.

Anna Sniadach, Sarah Godsey, Maggi Kraft, Carrie Bottenburg, Ken Aho, and Evan Blibrey

Subject: Biological & Natural Sciences

Mountain spring controls on stream water quality and quantity in the non-perennial Gibson Jack watershed in southeastern Idaho

Natural springs represent an important transition between surface and subsurface flows, and in the semi-arid mountain west, springs' sensitivity to climate change remains uncertain. For example, resilient springs may serve as climate refugia, sustaining cold-water flows during drought whereas sensitive springs may experience flow loss, leading previously perennial streams to dry. To assess how recent variations in spring water quantity and quality affect flows in a non-perennial stream network, we focused on the Gibson Jack watershed in southeastern Idaho, where 30 springs have been identified. To understand stream sources and spring water quality, we sampled for water isotopes and we measured discharge, temperature, and salinity at the point of emergence of the springs. Preliminary results suggest that spring discharge contributes 12-37% of total watershed discharge and varies seasonally rather than remaining stable throughout the seasonal recession. Spring discharge decreases seasonally by 33-95% even though isotopes reveal that spring water is consistently derived from snow. As the snowfall fraction decreases, springs may

thus be disproportionately impacted, implying that non-perennial stream networks may become both warmer and drier.

Weston Spraktes, Alex Rose, Hunter Jones, and Artti Kellokumpu

Subject: Business, Economics & Public Administration

Oh Zaddy: Erotic Attachments to Right Wing Personal Brands

There has been a global rise of brand attachment to right wing authoritarian figures. These attachments do not follow traditional psychological identity scripts, as contemporary theory would suggest. Instead, we argue that these attachments are libidinal, and thus irrational and sexualized. The left are using traditional methods of argument to counteract this rise, but until the underlying contradiction is addressed, any argument made is ineffective and can provide the opposite effect, in turn strengthening the attachment.

Rachel Sutherland and Spencer Moore

Subject: Humanities, Behavioral & Social Sciences

Stone Testimonies: The Archaeology of LDS Symbolism in Mountain View Cemetery

Mortuary and symbolic data from grave markers at Mountain View Cemetery in Pocatello, Idaho, were analyzed to explore the relationship between religious architecture and community demographics. This study examines trends in the emergence of LDS-specific symbolism, focusing on how the construction of religious architecture in the region may influence local mortuary practices. Religious symbolism in the cemetery increased after religious architecture was constructed in the area. This research contributes to our understanding of how religious and cultural shifts are reflected in cemetery landscapes.

Rifat Ara Tasnim

Subject: Education, Learning & Training

Exploring Different Text-Based Instruction Overlays in Video Games: Impact on Player Performance and Experience

While designing a video game, the first priority of game developers is to create an ultimate source of fun and entertainment. Even though the proper design of game rules and the placement of game challenges are crucial to achieving this goal, teaching players how to navigate and interact with them is pivotal. Tutorials and instructions, particularly in serious games, are vital for guiding players toward success. A common approach in serious games is the use of text-based instruction overlays to assist players throughout the game. In this experiment, we designed and developed a 2D game to explore whether different formats of text-based instruction overlays integrated into the gameplay have a unique influence on players' performances as well as game experiences. Three versions of the game were developed, with the only variation being the layout of the text-based instructions. The game mechanics were intentionally kept simple to ensure playability for individuals of varying levels of expertise. A controlled experiment was conducted on 30 participants. Our experimental outcome exhibits that different representations of text-based instruction not only impacted players' game performances but also affected their game experience across multiple factors. Ultimately, the findings demonstrated that simpler layouts are more effective in providing players with a better overall experience.

Emme Tucker and Sarah Emert

Subject: Humanities, Behavioral & Social Sciences

Predicting Health Behaviors using Posttraumatic Stress Disorder Symptom Clusters

There is a dearth in the literature surrounding PTSD symptom clusters (i.e., intrusions, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity) as predictors of health correlates. This presentation introduces a secondary data analysis which examined PTSD symptomology as

a predictor of five different health correlates (alcohol use, drug use, maladaptive eating behavior, gambling, and sleep difficulty) and the four PTSD symptom clusters as a predictor of these health behaviors. Participants were 1,350 college students aged 18-53 (M = 19.99, SD = 4.31). The present analysis examined PTSD symptom severity and symptom clusters as a predictor of the five health correlates through a series of univariate linear regression analyses and a multivariate multiple linear regression analysis. PTSD severity was found to be a significant predictor of alcohol use (AUDIT-C), drug use (CAGE-AID), maladaptive eating behavior (EDE-QS), and sleep difficulty (ASSQ-SDS), but not gambling behavior (PGSI). Negative alterations in cognitions and mood was also significantly predictive of drug use and eating behavior. Alterations in arousal and reactivity was significantly predictive of drug use, eating behavior, and sleep difficulty. Negative alterations in cognitions and mood and alterations in arousal and reactivity (i.e., PTSD symptom clusters D and E) may be mechanisms related to the experiences of these mental and behavioral health correlates. Future research could address additional factors that may influence these health correlates.

Samantha Unwin, Jose Sanchez, and Elleah Wilding

Subject: Humanities, Behavioral & Social Sciences

Gravestone Symbology and Resilience of the Greek Orthodox Community in Pocatello, ID

Resilience is generally described as a process embedded into the wider social environment, which entails the ability of individuals to respond to ongoing change. Such research is often preoccupied with accounts of individualized adaptation when understanding how migrants cope in the face of adversity. While much literature focuses on resilience-enhancing factors, advancing a more subjective understanding of resilience through symbology of collective resilience through time has been overlooked. This research used gravestone symbology from the Greek Orthodox community in Pocatello through time, to track patterns of cultural resiliency of a migrant population. Between 1910-1920, the Union Pacific Railroad brought immigrants from around the world to Idaho. Among them, Greek immigrants, joining the ranks of the Short Line Railroad workers established the Assumption of the Blessed Virgin Mary Greek Orthodox Church (ABVMGOC), Pocatello in 1915. This church remains as the oldest of the two Hellenic structures in Idaho. Many Greeks fled the region during the 1922 Railway Shopmen's Strike, yet the church is a stronghold of Greek culture in Idaho today. For this project, we collected dates of birth/death, age, sex, grave style, shape, symbology, inscriptions, and grave location of 92 graves of confirmed members of the ABVMGOC in Mountain View Cemetery, Pocatello, Idaho. Death and burial records of members of the church between 1960-2024 were consulted. After over more than a century of settlement in the area, the ABVMGOC gravestones did not show significant changes in grave styles, materials, or inscriptions through time. While placement of gravestones is sporadic and the community is not focused in any single area of the cemetery, closer placement indicated closer familial relationships. These results suggest a strong community heritage amongst the ABVMGOC community, which has resisted acculturation of gravestone iconography despite their historical embedding into the local community.

Greesh Vaidya, Arya Ebrahimpour, Bruce Savage, and Prateek Karna

Subject: Engineering, Physical & Mathematical Sciences

Ultra-High-Performance Concrete for Compressed Air Energy Storage

This study investigates the viability of Ultra-High-Performance Concrete (UHPC) as a structural material for above-ground Compressed Air Energy Storage (CAES) tanks. Given its superior compressive and tensile strength, enhanced durability, and resistance to environmental degradation, UHPC presents significant advantages over conventional concrete in high-pressure storage applications. A scaled UHPC prototype tank was designed and experimentally evaluated under pressures up to 4 MPa (580 psi). Strain data collected from the model was analyzed to assess structural behavior and validate computational models developed in ANSYS Workbench. The experimental and numerical results demonstrated strong agreement in strain values for the steel with relative percentage errors of 3.45% without UHPC and 0.57% with UHPC. Differences in strain values for the physical and numerical UHPC were a little greater, at slightly more than 18%. However, the measured values confirmed the structural integrity and feasibility of UHPC for CAES applications.

Additionally, the study explored the role of an integrated rubber liner in optimizing strain distribution, revealing its potential to mitigate localized stress concentrations and enhance the tank's mechanical performance. These findings highlight UHPC's suitability for next-generation CAES infrastructure, offering a resilient and efficient alternative to traditional storage materials. Using UHPC in the tank significantly enhances its structural integrity by reducing the stress and strain in the smaller cylinders. The tensile strength of UHPC, which is considerably higher than the maximum stress recorded in the modeling ensures that the tank can withstand high-pressure conditions without compromising safety. The robustness of UHPC, combined with the promising results from both experimental and computer modeling data, demonstrates the material's effectiveness in reinforcing the tank's performance. This makes UHPC a reliable choice for high-stress applications in compressed air storage systems.

Kristina Welborn and Monica Mispireta

Subject: Health, Nutrition & Clinical Sciences

Diagnosis Protocol for Treatment-Resistant Depression

Depression is a generalized medical condition affecting thoughts, mood, and physical health that causes large professional, economic, social, and personal losses. It is the leading cause of disability worldwide with an associated 10-year reduction in life expectancy. Major depressive disorder (MDD) is a more severe form of depression, and a subset of MDD known as treatment-resistant depression (TRD) is especially debilitating. TRD is difficult to manage, and outcomes are usually poor. Treatment of TRD is further complicated by the lack of consensus on the definition of the disease which can lead to misdiagnosis and delayed treatment. Without proper diagnosis, patients may not be informed of all possible treatments. This quality improvement project addressed the issue of misdiagnosis of TRD by creating and implementing a diagnostic protocol to be used by providers at a mental health clinic in Meridian, Idaho. Plan-Do-Study-Act Methodology will be used to develop and standardize the definition of TRD and to facilitate collaboration with the providers. Standardization of documentation was achieved by selecting an ICD-10 code to represent TRD diagnosis (F33.9). To evaluate the adoption of this protocol by providers, ICD-10 codes will be collected two months prior to implementation and one month post implementation. Patient data will be obtained from the electronic health record and will be de-identified prior to data analysis. We anticipate that adoption of the TRD diagnostic criteria will result in an increased use of the ICD-10 code representing TRD (F33.9). Proper diagnosis is the first step in navigating treatment. Misdiagnosis can cause patients to suffer from prolonged disease and inadequate treatment. We anticipate this project will help improve the timely and accurate diagnosis of TRD. When TRD is promptly identified, delays in treatment are less likely to occur.

Abigail West, Connie Miller, and Dan Hudock

Subject: Humanities, Behavioral & Social Sciences

The Power of Peer Interaction: How Group Therapy Shapes Social Communication

Group therapy creates real-world scenarios where clients generalize skills, build connections, and accelerate progress through shared experiences, unattainable in individual therapy. It provides adolescents a semi-structured setting to practice strategies with peers and access adult support (White et al., 2010). Peer interactions create learning environments adult-led instruction cannot replicate (Turkstra, 2000). Non-ideal groups—those with varied needs, ages, and skill levels—can be equally powerful, leveraging diversity for growth (Miller, 2023). This study explored group dynamics in fostering social communication, treatment format impact, and generalization from conversation to cooperation skills. Two non-ideal groups were compared. Academy NExT (AN) was a week-long program for 15 adolescents (ages 15–21) with disabilities documented through a Section 504 plan or IEP. Activities included mock interviews, collaborative projects, and soft-skills training. Three graduate students and one clinical instructor provided social communication instruction. The ISU on-campus SLP clinic involved three adolescents (ages 12–16) in a 12-week program with twice-weekly individual and group sessions. Neurodiverse-affirming methodologies were implemented. Pre- and post-treatment rubrics assessed conversation (initiation, maintenance, detail, awareness) and

cooperation (task focus, engagement, collaboration, language, self-awareness). Conversation skills were taught. Cooperation skills were assessed for generalization. Both groups demonstrated gains in every assessed area. The greatest cooperation gains: task focus(AN +1.09, ISU +0.33), engagement(AN +0.73, ISU +0.33), and cooperation(AN +0.64, ISU +0.33). The greatest conversation gains: Initiation(AN +0.73, ISU +1.0) and adding detail(AN +0.64, ISU +1.0). AN demonstrated greater gains in cooperation, likely due to its workplace-focused environment emphasizing daily collaborative projects and diverse peer interactions. ISU clinic demonstrated greater gains in conversation, likely from repeated practice and deeper exploration of social communication skills. Results from this project demonstrated that the power of a group is a driving force in fostering social communication growth. Results from this project demonstrated that the power of a group is a driving force in fostering social communication growth.

Jiemin Yuan

Subject: Biological & Natural Sciences

Rodent Versus Zebrafish: Translatability of the Larval Zebrafish Lateral Line Neuromast Model as A High-Throughput Screening (HTS) Method for Noise-Induced Hearing Loss Drug Discovery

Noise-induced hearing loss (NIHL) represents a significant global health challenge, with no FDA-approved treatments currently available. The lack of high-throughput screening (HTS) platforms has impeded progress in NIHL drug discovery, as traditional rodent models are both time-intensive and costly, underscoring the need for innovative screening alternatives. Glutamate excitotoxicity is a central mechanism in NIHL, driving damage to hair cells and the auditory nerve. The larval zebrafish (Danio rerio) emerges as a promising model, owing to its rapid development and the structural and functional parallels between its lateral line neuromasts and mammalian cochlear hair cells. Building on a chemically induced glutamate excitotoxicity zebrafish model (Sheets, Sci. Reports, 2017), this approach offers a robust framework for NIHL research. Given the incomplete understanding of noise-induced ototoxicity's molecular mechanisms, the Xu lab integrates high-throughput phenotypic screening in larval zebrafish with advanced computational techniques to identify novel small-molecule otoprotective agents, advancing the pursuit of effective NIHL therapeutics. Our data shows that if one assay assess high protection in fish, the likelihood of a compound exerting high protection in rodents is above 72%. (High+high) fish results correspond to 100% high protection in rodents whereas (high+low) and (high+no) fish data correspond to over 60% of high protection in rodents. This work presents an important guideline for high-throughput screening and prioritizing compounds using the efficient larval zebrafish assay, which has the potential to overcome the current NIHL drug screening bottleneck and accelerates the therapeutic development.

Doctor of Pharmacy and Health Resident Abstracts

Mikayla Antonson, Duncan Andrus, Tanner Tracy, Zach Rosko, and Tom Wadsworth

Subject: Health, Nutrition & Clinical Sciences

Community Pharmacists in Medication-Assisted Therapy for Opioid Use Disorder: Facilitating Positive Outcomes Through Prescribing, Patient Management, and Primary Care Referrals

This study examines the impact of pharmacist scope of practice expansion in Idaho, which has enabled pharmacists to autonomously provide a broader range of services. Specifically, we conducted a retrospective descriptive analysis of a unique community pharmacy based delivery model for pharmacist prescribed maintenance buprenorphine therapy in patients with opioid use disorder (OUD). The study focuses on adherence, engagement, care coordination, and economic impacts to assess the role of community pharmacists in enhancing access to OUD treatment within their expanded practice capabilities. This retrospective descriptive analysis includes all patients who received pharmacist-prescribed buprenorphine at an independent community pharmacy site in Northern Idaho between program implementation and September 30, 2024. Deidentified data will be extracted from the pharmacy's electronic medical record and management software and analyzed with descriptive statistics, focusing on the following data points: Adherence: The Percentage of Days Covered (PDC) for the prescribed buprenorphine agent(s) during the study period will be calculated. If the patient had been filling buprenorphine prescriptions at the pharmacy before the study, the PDC for the preceding year will also be evaluated. Engagement: Retention time in the OUD service, the number of visits, and the average time between visits for each patient will be calculated. Care Coordination: Patient-reported data on the presence of an established Primary Care Provider (PCP) at each visit with the pharmacy will be collected. For patients initially without a PCP who established care during the intervention period, the time from the initial recommendation to the establishment with a PCP will be documented. Economic: The payer mix of patients (e.g., private insurance, Medicaid, self-pay) will be documented. Additionally, estimated out-of-pocket costs for buprenorphine therapy and medical visits will be evaluated. These data points will be used to assess pharmacist-led buprenorphine therapy and its impact on adherence, engagement, care coordination, and patient economic status.

Jake Arbon, Harrison Schurr, and Trent Holmberg

Subject: Health, Nutrition & Clinical Sciences

The Regulatory Complexities of Forensic Psychiatry Across State Lines

Forensic psychiatry evaluations differ in part from other psychiatric evaluations in that no doctor-patient relationship is established. Occasionally, forensic psychiatrists are asked to perform evaluations across state lines, raising questions about how state licensing requirements may differ in forensic contexts. To investigate, inquiries were sent to the Boards of Medicine in each U.S. state asking if a one-time forensic evaluation was considered the practice of medicine requiring licensure. Federation of State Medical Boards documentation was reviewed regarding expert witness qualification requirements as well as telemedicine licensing requirements published by the Center for Connected Health Policy (CCHP). For expert witness requirements, 27 states require licensure, 22 states do not, and one state has no statutory requirement. For telemedicine consultation, 23 states required licensure in their state, 15 required licensure from any state, and 12 had special requirements or no statute. Medical boards' responses on forensic evaluations varied. Of 25 respondents, 21 deemed it practicing medicine, 1 did not, and 3 were unclear. Ambiguous standards delay evaluation in underserved communities and increase risk for psychiatrists, highlighting the need for standardization. This publication is not comprehensive nor legal advice for this topic. Qualified legal advice should be sought for individual circumstances.

Kristen Caldwell, Mary Cutright, Jordan Ferro, Brooke Buffat, and John Holmes

Subject: Health, Nutrition & Clinical Sciences

Utilizing Pharmacists to Improve Transitions of Care During Hospital and Emergency Department Follow-Up at a Federally Qualified Health Center

Approximately 50% of patients experience outpatient medication errors due to unimplemented discharge plans following hospitalization. These errors highlight the need for accurate medication lists and proper communication during transitions of care (TOC). Pharmacist involvement in TOC reduces hospital readmissions, emergency visits, and adverse events. Pharmacist-driven follow-up and comprehensive medication reviews were implemented in a Federally Qualified Health Center to address known risk factors for hospital readmission. Beginning in October 2024, patients scheduled at the FQHC for a hospital or ED follow-up visit with their provider were identified for a co-visit with a clinical pharmacist. Eligible patients were aged 18 and older with a medication change upon discharge, taking seven or more medications, or prescribed a high-risk medication. Pharmacist interventions included performing medication reconciliation, resolving medication-related problems, and scheduling follow-up visits for medication education and management as needed. Medication changes, medication-related problems, and 30 day readmission rates were identified and analyzed using descriptive statistics. As of February 5, 2025, 25 patients discharged from the hospital and 5 patients discharged from the ED have received pharmacist intervention. Of the 25 patients discharged from the hospital, 2 patients were readmitted to the hospital and 6 patients visited the ED within 30 days of hospital discharge. None of the ED discharges have revisited the ED or been hospitalized within 30 days. Of the 30 patients, an average of 3 medications were removed from patient medication lists post pharmacist intervention. Numbers and types of medication related problems for the 30 patients have not been coded for data collection at this time. Analysis of medication-related problems is in progress. Both intervention and data collection are ongoing and the most up to date data will be presented at the time of presentation.

Mary Cutright, Kristen Caldwell, John Holmes, and Jordan Ferro

Subject: Health, Nutrition & Clinical Sciences

‘A Pill for Every Ill’: Establishing a Pharmacist Led Comprehensive Medication Management Program at a Federally Qualified Health Care Center

The number of Americans over the age of 65 that take five or more prescriptions has tripled in the past 20 years, leading to increased emergency visits and hospitalizations due to adverse drug events (ADEs). While medication reconciliation is necessary for hospital accreditation, it does significantly reduce ADEs or prevent hospital readmission. Comprehensive medication management (CMM), a pharmacist-led, patient-centered approach, optimizes medication use by addressing medication related problems. This quality improvement project evaluates the impact of pharmacist led CMM on medication adjustments at a federally qualified health center. A prospective electronic medical record (EMR) review identified eligible patients for pharmacist intervention. Inclusion criteria were patients age >18, having ≥ 10 active medications, and scheduled to see their primary care provider within 14 days. Patients who met eligibility criteria at the time of Medicare Annual Wellness exam scheduling were also referred. Pharmacists conducted CMM, addressing medication reconciliation, effectiveness, safety, adherence, and deprescribing opportunities. Treatment plan developed in collaboration with primary care provider. Number of medications deprescribed and medication related problems were identified using the pharmacy quality alliance (PQA) medication quality measures and were analyzed using descriptive statistics. Data collection started January 2025 and is ongoing. As of February 5th, 2025, 18 patients have received pharmacist intervention. Medication deprescribing was initiated in 5 patients. Number and type of medication related problems identified, medications deprescribed, adjusted, and achievement of basic quality metrics will be reported. This ongoing quality improvement project aimed to optimize medication use, and resolution of medication

related problems among high medication utilizers. Further analysis will assess the impact of CMM on ADE reduction, improvement of basic quality measures, and patient quality of life.

Chaston Ellis

Subject: Health, Nutrition & Clinical Sciences

Bridging the Knowledge Gap: Enhancing Delirium Recognition and Prevention Through Staff Education

Delirium is a serious and often preventable condition affecting hospitalized patients, leading to increased morbidity, mortality, and healthcare costs. Despite its significance, delirium remains under recognized by healthcare providers. Educating hospital staff on delirium recognition and prevention is essential for improving patient outcomes. This study assessed the impact of an educational session on delirium awareness among nurses, CNAs, and related staff. Participants completed a pre- and post-survey using a Likert scale (1-5) to assess their knowledge and confidence in delirium recognition and management. A total of 22 participants completed both surveys. Data were analyzed using paired t-tests, with statistical significance set at p < 0.05. The mean pre-survey score was 3.93, increasing to 4.56 post-survey (p < 0.001), indicating a statistically significant improvement in knowledge and confidence. All participants demonstrated increased awareness of delirium symptoms and management strategies. Delirium education is a critical yet often overlooked component of hospital care. This study supports the integration of structured training sessions to enhance delirium recognition and intervention by frontline healthcare staff. Given the significant improvement observed, expanding delirium education programs may lead to better patient outcomes and reduced hospital complications. Future studies should explore the long-term impact of such educational initiatives on clinical practice and patient care.

Leah Fortson

Subject: Health, Nutrition & Clinical Sciences

Meditation Group at a Women's Maximum Security Prison

Meditation is an ancient practice that has been around for thousands of years. More recently, it has been studied in the justice system as a potential method to resident well-being. It has been suggested to improve mental wellbeing, improve emotional regulation, reduce violence, and reduce recidivism. For this educational project, I started a weekly meditation group at Pocatello Women's Correctional Center, PWCC. PWCC is a maximum-security prison that houses around 330 residents. At the time of the start of the project, Summer 2024, there were currently no meditation groups at PWCC. Residents at PWCC did have access to social workers and counselors and psychiatric medication management services. Weekly meditation groups led by psychiatry resident. TV with natural scenery playing. Unfortunately, the course was cut short due to scheduling changes that were beyond my control. Throughout, participants reported improved mood, improved stress tolerance, and decreased interpersonal conflict after participating in group meditation. All results were qualitative. Weekly meditation groups improve self-reported mood and stress tolerance among residents at a women's maximum security prison.

Landon Hillebrant

Subject: Health, Nutrition & Clinical Sciences

Completion/Distribution Rate Improvement of Physician Orders for Scope of Treatment (POST) Forms Among Patients Over the Age of 65

Address the gap in the completion and distribution rates of Physician Orders for Scope of Treatment (POST) forms among patients aged 65 and older in a family medicine practice. Despite the importance of POST forms in ensuring that patients' end-of-life care preferences are documented and respected, these forms were often not completed or distributed during annual Medicare wellness exams due to competing priorities. The intervention successfully increased the POST form completion and distribution rate from 0%

in December 2024 to 44% in January 2025, exceeding the goal of 40%. I was able to demonstrate that integrating a systematic approach through morning huddles and patient education significantly improved POST form completion and distribution rates. Future steps include: expanding the initiative beyond the initial patient cohort, refining the electronic tracking system for POST form status, and encouraging continued discussions on end-of-life care planning during routine visits.

Harrison Hoskins, Jordan Ferro, and John Holmes

Subject: Health, Nutrition & Clinical Sciences

Inappropriate Use of Inhaled Corticosteroids (ICS) in Patients with Chronic Obstructive Pulmonary Disease (COPD)

This quality improvement (QI) project highlights the over-use of ICS despite updated Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines favoring long-acting beta agonists (LABA) and long-acting muscarinic antagonists (LAMA) for COPD management. This project hypothesizes that pharmacist-led interventions can reduce inappropriate ICS use, improving adherence to guideline-directed medical therapy (GDMT) and reducing COPD exacerbations and hospitalizations linked to ICS-related complications. This QI project conducted at a Federally Qualified Health Center (FQHC) included patients with an active diagnosis of COPD who were prescribed ICS between May 1, 2023, and April 30, 2024. The study involves pharmacist-led interventions, which include chart review led recommendations, and assessing patients for inappropriate ICS use and transitioning them to alternative therapies (LABA/LAMA) where appropriate. Pharmacists will provide education on inhaler techniques, ICS risks, and lifestyle changes such as smoking cessation as needed. Follow-up appointments will be scheduled on a case-by-case basis.

Ryan Kelley, Kathleen Shangraw, Christian Schmutz, Tom Dowdle, Caleb Porter, Merrick Reynolds, Zachary Schwartz, Olivia Sutton, and Brent Kious

Subject: Health, Nutrition & Clinical Sciences

Medical, Psychiatric, and Sociodemographic Predictors of Clozapine Initiation at an Academic Medical Center

Clozapine is an effective yet underutilized treatment for treatment-resistant schizophrenia spectrum disorders. This study aimed to identify factors affecting clozapine prescribing patterns among patients with treatment-resistant schizophrenia and schizoaffective disorder at an academic medical center. This retrospective combined cohort and case-control study examined demographic, socioeconomic, medical and psychiatric characteristics to determine predictors of clozapine initiation. Eligible patients had a diagnosis of schizophrenia or schizoaffective disorder with at least two prior antipsychotic trials and were admitted to a University of Utah inpatient psychiatric facility (1/2014–3/2021). Patients who did and did not receive clozapine during the index hospitalization were compared in cohort and case-control study arms. Twelve percent (59/477) of the cohort received clozapine during the index admission. Among the cohort (n = 477), Black patients were twice as likely to receive clozapine than White and Hispanic patients (OR 2.18, 95% CI 1.20–3.97, p = 0.008). In the case-control analysis, patients with a greater number of previous psychiatric admissions (OR 1.14, p = 0.079) and antipsychotic trials (OR 1.40, p = 0.038) had greater odds of receiving clozapine. Homelessness was identified as a predictor against clozapine use (OR 2.77, p = 0.014). This is the first study to identify homelessness as a predictor against clozapine use, which raises important clinical and ethical considerations. Our findings also add to the literature on clozapine prescribing discrepancies among ethnic-minority patients. Overall, clozapine remains underutilized as the gold-standard treatment for treatment resistant schizophrenia-spectrum disorders, reinforcing a need to improve evidence-based prescribing.

Sophia Kirsinas, Cathy Oliphant, Alexis Simpson, and Elaine Nguyen

Subject: Health, Nutrition & Clinical Sciences

Readability and Credibility of Online Patient-Directed Information about Opioid Addiction

Background: Opioid addiction remains a major public health issue in the United States with rising overdose deaths and increasing online searches for treatment. Accurate, accessible patient-directed online information is essential, yet its readability and credibility remain uncertain. Objective: This study aims to evaluate the readability and credibility of online patient-directed information on opioid addiction treatment and support. Methods: We analyzed text from the top 20 patient-directed web pages retrieved through a Google search (conducted January 2025) on opioid addiction treatment. Readability was assessed using multiple indices: Flesch Kincaid Reading Ease, Flesch Kincaid Grade Level, Gunning Fog Score, Coleman-Liau Index, and the SMOG Index. Credibility was evaluated based on the JAMA benchmark and descriptive statistics were used to analyze data, which results reported as counts and percentages. Comparisons were also made between publishers, and groups were compared using the ANOVA, chi-square, or Fisher's exact test as appropriate. Results: A total of 20 websites were chosen by two independent reviewers. Results for the mean ± standard deviation scores for each of the readability tests are as follows; Flesch Kincaid Reading Ease 35.725 ± 10.912, Flesch Kindcaid Grade Level 12.900 ± 2.370, Gunning Fog 14.995 ± 2.550, SMOG Index 12.165 ± 1.970, Coleman-Liau 14.970 ± 1.673. The results for the JAMA credibility are as follows; Academic (66.67%), Government (33.33%), and Other (40%); p value = 0.811. We conducted a fisher's exact test for our JAMA data and found it to be not significant between types of publishers. Conclusion: Our analysis of 20 websites found that readability averaged at the college to graduate level, with no significant differences across publisher types in reading level or JAMA credibility.

Samuel McKnight, Nathan Spann, Elaine Nguyen, Chris Owens, and Kevin Cleveland

Subject: Health, Nutrition & Clinical Sciences

Implementing Sustainable PRISM Model-Based Mobile Health Clinics

Access to healthcare services to the underserved is especially challenging in rural states like Idaho. This work describes implementation of sustainable mobile health clinics to deliver vaccinations and other healthcare services (glucose, blood pressure, cholesterol and vision screening, etc.) to underserved populations in Idaho. The Practical Robust Implementation and Sustainability Model (PRISM) was used to guide dissemination and implementation of mobile health clinics. Process components were categorized using PRISM's four key domains: Program (Intervention), External Environment, Implementation and Sustainability Infrastructure, and Recipients, allowing analysis of implementation of mobile health clinics to refine future approaches. Data was collected and presented from two years of mobile health clinic work. We were able to systematically identify key elements within PRISM's four domains, from an organizational perspective and a patient perspective, that are vital for the successful implementation of sustainable mobile health clinics. These elements included the desire to bring services to underserved populations, accessible and patient-centered services, partnerships with community organizations, and need for long-term funding, among others. Using these elements, the mobile clinics provided 8,840 total services in 2022 and 12,911 services in 2023. Using PRISM, key factors were identified in designing a mobile health clinic, allowing us to translate evidence-based practices for dissemination and implementation of a sustainable mobile health clinic.

Victoria Pham, Brittney Patton, Elaine Nguyen, and Kevin Cleveland

Subject: Health, Nutrition & Clinical Sciences

Reducing Vaccine Hesitancy in College-Aged Students

Vaccine hesitancy has long been regarded as a formidable challenge in the face of achieving herd immunity and eradicating preventable infectious diseases. Those in the 18 to 44 year old age group have the lowest overall vaccination rates out of any other demographic. This project aimed to provide influenza (flu) vaccine knowledge and reduce vaccine hesitancy among 18 to 30 year old college students at a public university in the US Mountain West, as well as characterize motivators and barriers to vaccination. Idaho State University pharmacy students collaborated with Boise State University (BSU) public health professionals to conduct an in-person flu vaccine educational booth campaign at BSU in November of 2024. The effectiveness of the campaign as well as motivators and barriers to flu vaccination was assessed using an electronic survey. Over 200 students visited the booth and 48 college-aged respondents who completed the assessment survey. The majority of respondents were unvaccinated (72.9% vs. 27.1% vaccinated). Nearly 70% of booth attendees reported some degree of increase in flu vaccine knowledge. Furthermore, 71.4% of unvaccinated respondents reported some degree of increased likelihood to get vaccinated. Common motivators for flu vaccination included school or employment mandates and financial incentives. Less than half of vaccinated respondents encountered any barriers; nevertheless, some that were identified included convenience & accessibility and lack of insurance. The primary barriers reported among unvaccinated respondents were forgetfulness, perceived good health, and side effect concerns. Overall, the in-person educational flu vaccine campaign was successful at increasing knowledge. The motivators and barriers to vaccination among BSU students revealed that future initiatives to address vaccine hesitancy will need to focus on improving access and awareness for on-campus vaccination resources.

Colton Phippen, Cody Cunningham, and Sheldon Wernick

Subject: Health, Nutrition & Clinical Sciences

Second Hand Observation Targeting Stress in Pediatrics (SHOTS-P)

Pediatric fear and anxiety related to medical visits are significant barriers to effective healthcare. A 2018 University of Michigan Children's Hospital poll found that 50% of parents reported their child aged 2-5 feared doctor visits, with a major contributor being fear of shots. Among 2-3-year-olds, 66% reported fear of vaccinations, while 43% cited stranger anxiety. Among 4-5-year-olds, 89% reported fear of shots, and 14% had stranger anxiety. A 2021 study in CHILDREN reported that 61% of children aged 7-10 were highly fearful of needle procedures, 73% of blood draws, 45% of pain, and 21% of the unknown. Given the prevalence of pediatric medical anxiety, this study seeks to mitigate fear through secondhand exposure to common medical interventions. Our intervention involved demonstrating routine medical procedures—such as immunizations, casting, splinting, blood draws, and suturing—on stuffed animals while explaining each step at an age-appropriate level. Participants (parents and children) were surveyed before and after the intervention. The data suggest that most children experience fear or anxiety at the doctor's office, but this fear rarely prevents visits. Following the intervention (demonstration of procedures potentially associated with triggering fear) , the majority of parents believed their child's experience would improve (92.59%). However, none of the parents felt that the demonstration would significantly impact their own comfort level in taking their child to the next visit.

Rachel Ray, Kasidy McKay, Christopher Chatwin, Kunal Amin, and Elaine Nguyen

Subject: Business, Economics & Public Administration

Need and Interest in Personal Finance Elective in ISU Student Pharmacists

Introduction: A career in pharmacy can offer many benefits. However, it does not come without a potentially substantial financial burden from debt. Data from the median values of estimated debt owed for the graduating classes of Idaho State University (ISU) College of Pharmacy (COP) from the years 2020-2024 ranged from $107,000-$140,000. Given the high debt burden of student pharmacists and the financial knowledge needed to address debt, this study determined the need and interest for a personal finance elective within the ISU pharmacy curriculum. Offering such a course could enhance the financial literacy of student pharmacists, empowering them to confidently navigate their finances. Materials/methods: In January 2025, all ISU COP students received an email invitation to participate in an anonymous, 5-10 minute survey with demographic, financial literacy, and financial perception questions. Results data were descriptively analyzed using counts and percentages. This work was deemed non-research by ISU's Human Subjects Committee. Results: There were 84 student respondents with higher than national average financial literacy. The majority of respondents (67.5%) agreed to some degree that finances are a significant source of worry for them and 46.3% shared that they would be or would have been interested in a financial literacy elective. When asked to rate their confidence in managing their own finances and if they have the adequate knowledge to make the best financial decisions for themselves, over half of respondents chose "somewhat confident" and "somewhat agree", respectively. Conclusions: Almost half of respondents showed interest in having a financial literacy for student pharmacists elective. Given confidence level in ability and knowledge regarding management of finances and high performance on the financial literacy assessment, an elective (if offered) should be tailored to meet the needs of ISU student pharmacists.

Clayton Salmon, Skyler Messick, Kevin Cleveland, and Elaine Nguyen

Subject: Health, Nutrition & Clinical Sciences

Vaccine Education in K-12 Teachers and Staff

Introduction: In 2023-2024, only 47.2% of Americans and 37.9% of Idahoans received the influenza vaccine which is below the Healthy People 2030 goal of 70%. Furthermore, the vaccination rate of K-12 teachers remains low at 58% despite frequent exposure to illness. Influenza vaccination is essential for teachers to protect themselves and their school communities. This project evaluated the impact of an online educational intervention on vaccine knowledge among Idaho K-12 teachers and staff. Methods: Student pharmacists created an educational website with a 7-minute video covering the influenza vaccination and shared it with teachers and staff in two Idaho school districts (Caldwell and Kuna). The website included a post-quiz assessing knowledge (5 questions) and intervention effectiveness (1 question). Sharing of the website was facilitated through emails from district health personnel, and a $10 Starbucks gift card was offered to the first 100 participants. Descriptive statistics analyzed quiz performance and self-reported knowledge gains Results: Sixty-eight teachers and staff completed the post-quiz, with most from the Caldwell School District (75%). The majority were female (82%) and aged 45+ years (50%). Knowledge scores ranged from 40-100%, with 33% scoring 60% and 22% achieving a perfect score. Regarding perceived knowledge improvement, 46% reported a moderate increase, while 37% indicated a great or very great increase in their understanding of the influenza vaccine as a result of watching the video. Conclusions: The online intervention effectively increased influenza vaccine knowledge among K-12 teachers and staff, with 90% reporting moderate to very great knowledge gains. However, some participants experienced minimal improvement, suggesting the need for additional strategies to further increase knowledge improvement. This vaccine outreach project highlights the potential of web-based tools in improving vaccine education and promoting public health within school communities.

Undergraduate Abstracts

Megan Allgood, Anna Grinath, and Michael Thomas

Subject: Biological & Natural Sciences

TicTac's Totally Tubular Tail Protein: Bacteriophage Annotation Reveals "Fresh" Protein Functions for EK1 Cluster

The objective of this research project was to isolate and annotate the genome of a newly discovered bacteriophage, TicTac. The bacteriophage was discovered under a mint plant in a grassy, soil environment, conducive to that of Microbacterium foliorum, TicTac's host bacteria. The bacteriophage was then isolated, purified, and amplified. Isolation of phages from the soil sample used standard isolation techniques, including multiple rounds of purification in order to isolate a single bacteriophage. Samples were then amplified to obtain high concentration solutions necessary for acquiring transmission electron micrographs (TEM) images of the phage and extracting DNA for genome sequencing. TicTac is an EK1 cluster bacteriophage with podovirus (short non-contractile tail) morphology. TicTac's genome was sequenced by the University of Pittsburgh, revealing a genome of approximately 53,876 base pairs of DNA. In the process of annotating TicTac's genome, standard bioinformatics tools were used, including PECAAN, BLAST, HHpred, Glimmer, GeneMark, Starterator, Phamerator, and DeepTMHMM. Annotation of the genome provided evidence for 57 protein-coding genes. Putative functions were assigned to 19 of those genes. Notably, we were able to identify a gene coding for the major capsid protein due to experimental work performed at the University of South Florida for the bacteriophage "Akoni," for which they provided experimental evidence that gene 33 is a major capsid protein. Gene 33 for Akoni is syntenous with gene 36 for TicTac, enabling us to make the same functional annotation. Akoni and TicTac are now the only bacteriophages within their cluster with an identified major capsid protein. TicTac is also the first of its cluster with an identified tail tubular protein. This annotation was possible due to strong evidence from HHPRED, reporting coverage for two tail tubular proteins, one of which is specific to podoviridae.

Matthew Alonzo

Subject: Business, Economics & Public Administration

AI-Assisted Financial Insights on a Budget: A Comparative Study of Locally Hosted LLMs

The rapid evolution of artificial intelligence has democratized access to powerful analytical tools, yet the financial sector has been slow to adopt lightweight, locally-hosted Large Language Models (LLMs) for financial analysis. While cloud-based AI solutions dominate the market, they present challenges related to data privacy, ongoing subscription costs, and latency issues that can hinder real-time financial decision-making. Small businesses and independent financial analysts often lack the resources to leverage commercial-grade AI tools, creating a significant accessibility gap in financial technology. This research examines whether locally-hosted LLMs can effectively perform structured financial analysis tasks with limited computational resources. Using QUALCOMM Incorporated (QCOM) quarterly financial data as a case study, we evaluate various open-source LLMs—including Meta's Llama, Alibaba's Qwen, and DeepSeek models—to determine their analytical capabilities, accuracy, and practical utility for financial insights generation. The central question is whether these lightweight models running on modest hardware can produce actionable financial insights comparable to those from resource-intensive commercial solutions, potentially democratizing access to AI-assisted financial analysis. The results clearly demonstrate that while locally-hosted LLMs can generate structured financial analyses, the reliability of these analyses varies substantially across models. This variability underscores the importance of human oversight and verification when deploying these tools for financial decision-making. This study evaluates the capacity of locally-hosted Large Language Models to perform meaningful financial analysis on consumer-grade hardware. The findings reveal both promising capabilities and significant limitations that shape the potential applications of these technologies in financial contexts. In conclusion, locally-hosted LLMs represent a

significant advancement in democratizing access to AI-assisted financial analysis, enabling individuals and organizations with limited resources to benefit from these technologies. However, their current limitations necessitate human oversight and verification to ensure analytical integrity. As these models continue to evolve and prompt engineering techniques refine, the accuracy-accessibility balance will likely improve, further expanding the practical applications of local AI in financial contexts.

Jared Anderson

Subject: Creative Works Category

Etch the Soul

I am an autistic artist who deals with digital art, in a desperate attempt to try to understand and express how I see art. The work presented is meant to be a display of the laborious nature of creating art, because laying your soul bare in a months or even years long process is understandably an exhausting process at times, but it is one that I will never stop cherishing.

Jasmine Barajas, Makayla Searle, and Nate Nelson

Subject: Health, Nutrition & Clinical Sciences

Scatter Radiation Blocked by Lead Glasses

Individuals performing X-ray guided interventions are exposed to high radiation levels. 1 Protecting the eye lens from exposure is important as it is one of the most radiosensitive organs. 2 High level exposures of radiation could result in adverse effects to the eye lens, such as cataracts. 3-5 A device used to protect the eye lens during fluoroscopic exams is the use of lead glasses. When used correctly, lead glasses can significantly reduce dose. Six different tests were performed using the fluoroscopy machine and a phantom. A Gieger counter was used to measure the amount of scatter radiation produced. Half of the exams were performed with lead glasses shielding the Geiger counter and the other half were performed without anything blocking them. The Gieger counter was placed in 3 different areas 60 inches from the ground to replace exposure to the eye. It was placed 90° to IR (see Figure 1), 45° to the IR (see Figure 2), and at the feet of the table (see Figure 3). Continuous fluoro was used for 5 seconds. Five different readings per test were taken and an average was recorded (see Graph 1). For the tests performed during this study, measurements were taken in 3 different locations where individuals performing fluoroscopic exams are likely to stand. The results from this study reinforce the importance of understanding and following safety protocols. The use of lead safety glasses is a necessity for all medical professionals involved in fluoroscopy procedures. The results of this study proved our hypothesis to be correct. In comparing the amount of scatter radiation measured with and without lead glasses, the dose received while wearing lead glasses is reduced by about ½. Furthermore, increasing the distance between you and the IR further reduces the amount of scatter that reaches the eye lens.

Marializ Barrera

Subject: Health, Nutrition & Clinical Sciences

Scatter Radiation in Fluoroscopy

In medical imaging, scatter radiation can not only affect the quality of images, but it can also put both the patient and whoever else in the room at risk. Scatter radiation is when the primary x-ray beam interacts with the patient's body, causing some x-ray beams to deflect and scatter in different directions.1 Fluoroscopy increases the risk of radiation exposures to patient, staff, and others.2 The majority of the radiation exposure during a fluoroscopy exam comes from scatter radiation from the patient.3 Keeping a good distance and wearing a lead apron can help reduce the amount of exposure by providing protection and ensuring safety from any unwanted scatter radiation.4-5 It is important where you stand during a fluoroscopy study as these areas are located away from the direct path of any scatter radiation. The scatter radiation exposure was expected to be zero behind the wall. In addition, it was also expected to see the

highest exposure next to the patient. As seen from the results: the scatter radiation was higher next to the patient and there was no exposure behind our wall. The location of the tech console, which is a 45-degree angle from the patient, received more radiation than the chairs where family members sit which is also a 45-degree angle from the patient. The scatter radiation exposure was higher where the provider stands doing the procedure and where the tech controls the fluoroscopy machine.

Chelsea Blanchard and James Pascali

Subject: Humanities, Behavioral & Social Sciences

Now Hear This! Impacts of Media Representation on Deaf Political Engagement and Social Acceptance

In today's era of mass media consumption, information and understanding of others are largely shaped by media representation. A 2020 study by #RepresentationMatters found that 91% of respondents believe media representation influences societal perceptions (Alexander, 2020). This finding carries profound implications for the Deaf community, underscoring the crucial role that representation plays in the public's recognition, inclusion, and support of Deaf individuals. In the U.S., the Deaf population is one of the least represented groups in media, which directly impacts their access to opportunities, resources, and political support (NRG + Deaf West Theater, 2022). This research aims to investigate the connection between media exposure to Deaf individuals and the willingness of the hearing population to engage with Deaf politics and participate in social activities that promote equality and inclusion. Our study hypothesizes that increased media representation of the Deaf correlates with a greater willingness among respondents to accept and engage with the Deaf community, as well as to become involved in Deaf politics.This study focuses on two key questions: First, if the Deaf community is represented in the media, can we expect this to influence the hearing population's willingness to socially engage with the Deaf community? And second, if the representation is positive, will it lead to an increase in the hearing population's engagement with Deaf politics? The results of this study reveal a nuanced understanding of how various independent variables correlate with different types of political engagement and participation. The findings of this study support the hypothesis that increased media representation of the Deaf correlates with a greater willingness among respondents to engage with the Deaf community and participate in Deaf politics. Utilizing methods such as logistic regression, ordered logit regression, and dichotomous reindexing, this study provides valuable insights into how various independent variables, particularly media portrayals, influence individuals' engagement with Deaf political causes. The approach highlights the importance of media in shaping public attitudes toward Deaf individuals and their political participation.

Vianney Blanco, Cristal Castillo, Winter Konsella, Danna Reyes, and Tessa Anderson

Subject: Humanities, Behavioral & Social Sciences

The Influence of Gender and Language Experience on Academic Confidence at ISU

Academic confidence is a crucial factor in student success, and there are implications that certain factors could be influenced such as a student's gender and English language experience. This study is focusing on seeing the relationship between these three factors (academic confidence, gender, English language experience) among Idaho State University College students. The data will be analyzed using JASP to perform statistical tests. We will be using independent t-tests to compare groups based on gender and to compare groups based on English language experience. We will also be sending out a survey to gather information from students on campus.

Tayen Brooks, Jonathan Garritson, and Ryan Chapman

Subject: Engineering, Physical & Mathematical Sciences

DIY Geiger Counter

For the Capstone Project for ESET 2260: Nuclear Instrumentation, we are tasked with creating our own radiation detection instrument, developing a procedure for its operation, and demonstrating the functionality and performance of our detector. The purpose of this project is to gain a deeper understanding of the instrumentation used in the industry we plan to enter after completing our degree. Our objective is to build a functional Geiger-Muller tube that can detect beta and gamma ionizing radiation, along with a clear procedure for operating the device and interpreting the results, ensuring that no specialized expertise is required to utilize our experiment. GM Tube with the circuitry necessary to display readings when subjected to a radioactive source Utilizing laboratory equipment, solder the components onto a PCB following electrical diagrams.

Haley Burke, Emma Standley, Alyssa Harvey, Isabel Harbig, and Sean Phinney

Subject: Humanities, Behavioral & Social Sciences

Exploring the Link Between Parent and Child College Major Selection

Parents play a crucial role in shaping their children's lives. By molding and guiding their learning and understanding, they significantly impact their children's educational journeys and decisions. Research indicates that this parental influence extends into their children's college years and affects their undergraduate educational decisions (Karim & Jebat, 2024). Several factors contribute to this influence, including students' perception, parents' educational background, occupations, post-secondary education experiences, and involvement (Chan & Hu, 2023; Dorot & Davidovitch, 2023). However, there is a lack of research that explores the direct connection between a parent's college major and their children's chosen major. This study being conducted aims to investigate the influence of parents' undergraduate majors on their children's undergraduate major selection. Utilizing both qualitative and survey methodologies, this ongoing study plans to involve approximately 100 undergraduate students from Idaho State University. We hypothesize that a parent's undergraduate major has a significant influence over their child's choice of major for their undergraduate degree. The results of this study will be discussed on our poster.

Ashley Cantin, Alyse Maksimoski, Kavita Sharma, and Devaleena Pradhan

Subject: Biological & Natural Sciences

Rapid regulation of enzyme activity in male and female bluebanded gobies

Bluebanded gobies, Lythrypnus dalli, are a marine Teleost fish capable of rapid, bidirectional sex change. In these fish, phenotypic sex is determined by position in a social hierarchy, which requires context-appropriate synthesis of sex steroid hormones. The production of the most potent androgen in these fish, 11-ketotestosterone (11-KT), is mediated by the enzyme 11β-hydroxysteroid dehydrogenase (11β-HSD). 11-KT is known to be associated with the female-to-male sex change process, however, little is known about the mechanisms that regulate 11-KT synthesis even in stable fish. The goal of this study is to investigate whether 11β-HSD activity is regulated by rapid, non-genomic modes of action, such as phosphorylation and dephosphorylation, rather than the slower genomic modes of action. In order to investigate this question, we collected brains, gonads, and caudal muscle samples from stable male and female L. dalli. We will test the effects of phosphorylation by the individual and combined additions of Ca2+, Mg2+, and ATP; and the effects of dephosphorylating conditions through the addition of acid phosphatase. After the samples are allowed to incubate, hormones will be extracted for use in liquid chromatography-tandem mass spectroscopy (LC-MS/MS) in order to measure the concentration of 11-KT and its substrate,

11β-hydroxytestosterone, found in the sample and thereby determine 11β-HSD activity. We predict that enzyme activity will be differently regulated across tissue types and across sexes. This data will be crucial for understanding the biochemistry of L. dalli sex change and will pave the way for future studies investigating the role of rapid enzyme regulation in the production of other steroid hormones across species.

Cristal Castillo

Subject: Humanities, Behavioral & Social Sciences

Luchadoras por dentro y por fuera: Fighters Within and Without

"Luchadoras," a documentary by Paola Calvo and Patrick Jasim, draws attention to the resilience of women in Ciudad Juárez. Ciudad Juárez is known as one of the most dangerous cities in the world for women. The film tells the individual stories of three female wrestlers: Mini Sirenita, Lady Candy, and Baby Star and who manage to regain their agency while living within a machismo (known to be a form of sexism) and disruptive society. These female wrestlers do not see themselves as victims but as fighters who take back control of their own narrative to face the challenges. Although each woman is sharing their own story, there is a female community present in which women are able to help and be supportive to one another. In this film I analyzed how wrestling allows these female wrestlers to reappropriate violence, regain control of their narratives to face challenges and build a supportive female community. Even if there is injustice and corrupt violence in the city, there will undoubtedly always be women fighters fighting for their lives and for others.

Ericka Christensen, Jacob Bingham, Joshua Swift, Eliana Claps, Angelina Conrow, Ailun Li, and Nathan Scheiss

Subject: Humanities, Behavioral & Social Sciences

International Collaborations in Psychotherapy Research

In the field of psychology there has been a call for research containing international collaboration. International research collaboration (IRC) can be accomplished in many different methods such as data sharing, knowledge sharing, multi-site research, and cross-cultural studies. The purpose of IRC scholarship is to merge knowledge and resources in the interest of common goals (research) (Coles et al., 2022). Currently there are mixed findings regarding how much collaboration is taking place, visibility and productivity across disciplines (Chen et al., 2019; Wagner et al., 2019). There are claims that IRC in psychology is increasing over time (Kivlighan et al., 2018; Kliegl & Bates, 2011). Moreover, previous studies have identified that the majority of IRCs include an author form the United States, but that this proportion has been in decline the last twenty years (Adair & Huynh, 2012; Kivlighan, 2018). The purpose of this study is to examine the frequency of international research collaboration and explore trends related to IRCs in Psychotherapy Research.

Alexandra Cook, Stephanie Carrillo, and Miryam Nelson

Subject: Health, Nutrition & Clinical Sciences

Avoiding Dose Creep

Digital imaging is more forgiving in choosing techniques than film and has the ability to post-process for fixing overexposure. I-3,5 Because of this, dose creep became an issue. 2,4,5 Dose creep is the tendency to use more radiation than is necessary to obtain a diagnostic image. 1,2 Using more exposure decreases noise and quantum mottle and results in a diagnostic image. I-3 Images made in range and images that are overexposed look very We performed exposures on a hand phantom. For all exposures, a 40 in SID and a 10x12 collimation was utilized. The first exposure was the control with an optimal technique. The mAs of the control was then doubled for each subsequent exposure (see Table 1). Each exposure was repeated 5 times for veracity. The average exposure indicators (EL) were then recorded and compared to each exposure made (see Chart 1). One last exposure was made to determine when saturation occurred (see Figure 1) All 4

images were exposed with the same kVp and mAs was doubled from the controlled exposure. All images looked diagnostic but some were not within optimal range. This results in an increased dose to the patient. Technique charts, EI values and deviation index (DI) exposure numbers all help to prevent dose creep. 2,4,5 EI numbers are made by manufacturers to help prevent overexposure. * Technique charts can standardize exposure.

Diana Cortez, Leticia Herrera, Aimee Bozeman, Alleyna Martes, and Michele Brumley

Subject: Biological & Natural Sciences

Step-By-Step: Treadmill Stepping Behaviors Following Spinal Cord Injury

Following a spinal cord injury (SCI) communication between the brain and spinal cord is disrupted, affecting sensory and motor function. However, if the injury occurs during early development, plasticity within the spinal cord allows for greater recovery of motor function in comparison to adult injuries. Previous research with locomotor training suggests that treadmill training increases locomotor performance in animals with SCI. The purpose of this study was to examine hindlimb stepping behavior on a treadmill following neonatal SCI. Rats were placed into four groups (2 sexes x 2 surgical conditions). On postnatal day 1 (P1), all rats underwent either a low thoracic complete spinal cord transection (T8-T10) or a control sham operation. Through P10 to P17, each rat received 10 minute sessions of treadmill training three times a day for 8 days. Video recordings were conducted on the last session of the first and final day and scored for stepping behaviors. Treadmill steps were scored on the basis of coordination and foot posture with unilateral or bilateral being coordination descriptors and plantar, other, or mixed being foot posture descriptors. This study will help identify how plasticity and spinal circuitry can adapt and support hindlimb behaviors following SCI. This research has clinical applications in physical and rehabilitative therapies that utilize use-dependent activity to harness neural plasticity through training to promote better sensory and motor function.

Eliana CraigSmith and Leslie Nickerson

Subject: Education, Learning & Training

Using Learning Assistants to Facilitate Active Learning in Organic Chemistry

Active learning has been shown to improve student retention and minimize achievement gaps but can be difficult to implement in medium to large class sizes due to the high student-to-faculty ratio. To lower this ratio, students who have successfully passed the class are embedded in the class as Learning Assistants (LAs). In this study, we describe a course designed to instruct and prepare undergraduate LAs for facilitating small group work in a first semester organic chemistry class. We will examine how the course and facilitating experience impacts the LAs themselves as well as how it affects students' perceptions and learning experiences in the organic chemistry course. LAs were prepared through the course by reading and discussing pedagogy literature, practicing facilitation in small groups, and reviewing material ahead of the organic chemistry class. Data was collected from organic chemistry students in the form of surveys and course evaluations. Data from the LAs was collected by surveys, weekly reflections and course evaluations. Additional data from the LAs will be collected in the form of interviews. Initial review of the data suggests that the impact of LAs on students' experiences is positive and that the LAs themselves found the course and experience facilitating small groups beneficial and ultimately confidence building.

Tiffany Crotteau and Cory Bennett

Subject: Education, Learning & Training

To What Extent do PSTs Understand the Validity of a Students' Mathematical Argument

Whole-class discussions are one means by which students build conceptual understanding and develop important mathematical behaviors and habits of mind (Komatsu & Jones, 2021). However, rich mathematical discussions require students to appropriately construct a logical mathematical argument and this means teachers have a responsibility to help students develop these skills. This also suggests that preservice teachers' (PST) abilities to effectively notice student thinking is also a required skill (van Es & Sherin, 2021). That is, a teacher might be able to plan a whole-class discussion but without the ability to interpret students' thinking and support their thinking, the potential benefits of the discussion may be minimal. As such, this study sought to better understand PSTs' perspectives and beliefs on constructing and justifying mathematical arguments by having them assess the validity of middle school students' arguments. This study used a qualitative case study and included 20 undergraduate K-8 PSTs from a university in the Intermountain West. Using Zambak and Magiera's (2020) model of logical arguments, the research team co-created an argumentation map for one participant in order to come to consensus on the elements and structures that make for a logical mathematical argument; this also helped to ensure consistency when scoring. Next, the research team used a modified scoring guide (Zambak & Mageira) to determine PSTs overall Mathematical Argument skills. Findings highlight the challenges PSTs had with identifying key features of students' mathematical arguments and the ways in which they struggled to understand student explanations as presented. PSTs often relied on pictorial representations to understand students' mathematical arguments and in doing so, PSTs often failed to recognize the validity of the mathematical argument being made, which has implications for supporting all students' mathematical learning through discussions.

Jaden Davis, Liberty Madsen, Claire Heiner, and Olyvia Erickson

Subject: Humanities, Behavioral & Social Sciences

Investigation of Undergraduate Attitudes towards the LGBTQ+ Community

The United States of America has seen increasing political polarization. Although there has been recent research into perspectives regarding the LGBTQ+ community (Thompson, 2023; Kaufman et al., 2022), our local political environment may be unique due to several outstanding demographic factors of Pocatello's population. To gain insight into local undergraduate perspectives, we will conduct a survey. We hypothesize that those surveyed will still retain generally positive attitudes towards the LGBTQ+ community. We will also collect additional demographic data in order to compare differences in perspective between subgroups. The information we use will be collected via a survey within Qualtrics. The primary source of participants will be undergraduate students enrolled in Intro to Psych 1101 courses. In past years, surveys conducted have gathered an average of 150 responses, according to our project advisor. We used several question formats in our survey, based on question asked. The majority of our data will be collected with a Likert scale of 1-5, with 1 being strongly disagree, and 5 being strongly agree. We plan to test our hypothesis by using several between-subject t-tests. We will also be performing between-subject ANOVAs investigating the impact that religious affiliation has on attitude, as well as two-factor ANOVAs which will be investigating the relationship between several of our Likert scale questions, chi-square goodness of fit tests, and chi-square tests of Independence.

Ella Deasy, Chloe Roberts, Jazzy Hernandez, and Kali Earl

Subject: Humanities, Behavioral & Social Sciences

Sleep Duration and College Student's Productivity: A Correlational Study

The health and wellness of college students has become researchers' concern; especially in the areas of duration of sleep and school oriented productivity. Most active research regarding the wellness of students pertains to the quality of sleep and correlating workplace productivity; factors that are dissimilar to current articles. Furthermore, there is a growing necessity to understand the impacts that lack of sleep and excessive sleep can have on the efficiency and productivity of teenagers and young adults within an academic orientation. To study these variables, we curate a self-report survey to address questions of personal sleep duration and productivity within school, work, and daily tasks. To construct results we will conduct a Pearson's Correlation and Independent ANOVA to examine the relationship between sleep duration and productivity levels. Due to the historical studies, we know that there are correlational relationships between quality of sleep and workplace productivity, therefore, we hypothesize that longer durations of sleep increase levels of productivity.

Zoe Dejardin

Subject: Creative Works Category

Mental Health and Athletes

This podcast discusses mental health issues in athletes. More specifically, I decided to present this dramatic issue through the experience of Caleb Dressel, a professional swimmer. This was a sensitive subject to discuss as there are many controversial opinions on the subject. However, I have found it interesting to see that great and successful athletes, like Caleb Dressel, do go through similar challenges. I have also enjoyed getting the perspective and opinion of my teammate, Chelsea Radicia, on the subject. Everyone goes through issues and getting them off our chest is definitely beneficial. I encourage anyone who is interested in this subject to listen to the podcast attached to the poster

Kali Earl, Jazzy Hernandez, Chloe Roberts, and Ella Deasy

Subject: Humanities, Behavioral & Social Sciences

Social Media Engagement and Productivity in College Students - A Correlational Study

In this modern age social media engagement and use is up, how does this affect our target audience (ISU students) productivity? We are wondering if higher usage and engagement in social media(Instagram, TikTok, and others) has any significant impact on levels of productivity for school and work. To study this we are creating a survey to administer to ISU's students through our Psychology Research Methods course. We will then analyze data obtained by running statistical tests, and record our results in a research paper to determine if there is a correlation between the factors. Analyses of other research found that in most cases higher social media use and engagement decreases levels of productivity in the workplace and some research found similar results in social media use and productivity for students also. We hypothesize that higher engagement in social media (Instagram, TikTok, and others) decreases levels of productivity in school and work for ISU students as well.

Natalie Empey, Aiden Niblett, and Kinta Serve

Subject: Biological & Natural Sciences

Assessing the relationship between asbestos exposure and immune dysfunction in human subjects and mouse models

Exposure to Libby amphibole (LA) asbestos fibers have been linked to the development of autoimmune diseases and lung fibrosis. Additionally, we have previously shown that mesothelial cell autoantibodies (MCAAs) from asbestos-exposed people are associated with a higher prevalence of pleural fibrosis. An in

vitro study demonstrated MCAA binding increases collagen levels, but the mechanism underlying the production of collagen during the pro-fibrotic state is still incompletely understood. The objectives of this current study include 1) comparing the autoantibody prevalence in an asbestos-exposed human population to a control population, and 2) using a mouse model of asbestos exposure to examine immune function underlying autoantibody production after asbestos exposure. For the human models, we screened patient serum collected from the Center for Asbestos Related Diseases (CARD) in Libby, Montana. Using indirect enzyme-linked immunosorbent assays (ELISA) assays to detect antibody levels, we screened for two autoantibodies: MCAAs and anti-Plasminogen (PLG), which is a subset of MCAA. These tests were then compared to ELISA results of Normal Human Serum (NHS) to determine the percent prevalence of autoantibodies in healthy serum. For the mouse models, we determined the prevalence of autoantibodies via an indirect ELISA, examined collagen deposition by mesothelial cells, and assessed immune cell populations in the lungs of asbestos-exposed and control animals. The trend in the human study shows an increase in positive cases of both MCAA and anti-PLG, from approximately 8-9% in the NHS compared to an approximate 12-16% prevalence in patients' serum from CARD. Then, for the mouse study we have detected differences in lung immune cell populations in LA-exposed animals along with increased collagen deposition, suggesting immune dysfunction may contribute to autoantibody formation and collagen production. Together, these data reveal connections between immune dysfunction and asbestos-related disease development.

Miriam Fridel, Brandon Peecook, L.J. Krumenacker, and Robert Gay

Subject: Biological & Natural Sciences

Results of an Extensive Surface-Scanning Project of Idaho's Cretaceous Fossil Record

The Albian-Cenomanian Wayan Formation, predominantly exposed in eastern Idaho (USA), preserves a unique upland assemblage, including: dinosaurs, crocodilians, turtles, mammals, and fishes, as well as gymnosperm and angiosperm remains. The Wayan Formation has been understudied compared to broadly contemporaneous units in surrounding states. In 2025 the Idaho Museum of Natural History (IMNH) completed an ambitious program to digitize via surface laser scanning the Wayan Formation vertebrate record in order to provide digital specimen security during exhibit creation, create a comprehensive and accessible digital public collection, and create new education and outreach materials. The IMNH achieved these goals, and this project provides a roadmap for other institutions. There are two main steps for digitization; scanning the specimens, and processing the scans into 3D files for use. Specimens take between 5 minutes and an hour to scan, depending on their complexity. Each object received a minimum of 18 scan passes, with more complicated shapes requiring additional passes. A medium-sized, geometrically-simple specimen would take approximately an hour and a half to fully scan and process: processing the raw scans includes trimming background data and aligning all the scan passes. In total, 481 individual fossils were surface scanned between 2023 and early 2025. This represents all specimens suitable for surface scanning, >80% of Idaho's Cretaceous fossils at the IMNH, with >150 hours spent on scanning and post-processing. 87% of scanned specimens have been partially post-processed in alignment software, and 74% have been fully processed into manifold 3D objects suitable for upload to a database or 3D printing. 21% have been printed for use in education and outreach. As of February 2025, over 1,500 K-12 students have interacted with the 3D prints through an Oryctodromeus educational kit. Additionally, nearly 6,000 visitors have interacted with touchable Wayan 3D prints in the IMNH's gallery.

MaKell Furniss and Emily Mickelsen

Subject: Health, Nutrition & Clinical Sciences

Importance of Wearing Lead during Portable Exams

The focus of this research study is to demonstrate the importance of lead aprons during portable exams and how lead aprons impact the dose received by radiation workers. Radiation workers are consistently exposed to ionizing radiation. Due to radiation dose being cumulative over the radiation worker's life, it is

important to utilize practices to minimize dose for the radiation worker. Portable exams are a serious contributor to dose for radiation workers due to the lack of barriers and close proximity to the source of radiation. In settings where ionizing radiation is present, three cardinal rules of shielding, time and distance are used to help reduce dose. Lead aprons fall under the rule of shielding to help decrease dose. We conducted three trials to simulate the dose a radiation worker may receive during portable radiography exams. Our findings indicated that utilizing lead aprons during portable radiography is effective in decreasing dose to radiation workers. The significance of this study is to demonstrate the importance of radiation safety practices, specifically the use of lead aprons during portable exams.

Ciara Gaches, Aubrey Fuchs, Karolina Štětinová, and Robert Rieske

Subject: Humanities, Behavioral & Social Sciences

Stigmatization of Autism: Analyzing Caregiver Affiliate Stigmatization Experiences

Stigmatization is detrimental to all identities, and the autistic community is particularly vulnerable to these social discriminations. The internalized stigma surrounding autism can have profound implications for individuals, specifically on their perceived self-worth and competencies. However, autistic individuals are not alone when it comes to facing stigmatization. Unfortunately, caregivers and family members of people with autism often experience stigma by association, known as affiliate stigma, which can lead to significant psychological distress. This study aims to explore caregiver-affiliate stigmatization of their child's autism diagnosis during the diagnostic feedback session and the factors contributing to affiliate stigmatization. By employing Bronfenbrenner's social-ecological framework, we explore the multifaceted nature of stigmatization manifestations across various systems in the child's life. We seek to analyze family-intrinsic and -extrinsic variables to determine each's influence on caregiver-affiliate stigmatization. Understanding the intricacies of caregiver-affiliate stigmatization is crucial to both alleviating and assisting clinicians in preventing it. Caregivers (N = 455, M = 36.2 years old, SD = 8.3) of a diagnosed autistic child (M = 6.1 years old; SD = 3.8) were recruited via specialized social media groups and answered a nationwide Qualtrics survey regarding stigmatization. Families mostly resided in metropolitan areas with a population of 1 million or more (47.4%), as indicated by Rural-Urban Continuum Codes (RUCC; M = 2.5, SD = 2.2). Preliminary analysis revealed significant correlations between the caregiver's age at diagnosis (r = -0.07), clinician's helpful characteristics score (r = -0.14), community support (r = -0.22), and financial stress (r = 0.19). Ultimately, this research aims to guide the development of tailored interventions, improve diagnostic feedback, and advocate more effectively in addressing the specific needs of families influenced by these facets.

Ila Garrido

Subject: Creative Works Category

Feeding the Crown when the Root no Longer Can: Childhood Memory Loss and Adult Identity

When I was diagnosed with Complex PTSD (CPTSD) a few years ago, I gained an entirely new awareness of how trauma impacts the memory and identity of a person. I became fascinated with how trauma distorts, amplifies, and erases memory, and how that in turn affects the person as time goes on. In my pieces, I use saturated colors and dreamlike settings with a touch of uncanniness in order to catch the eye and bring the viewer in to contemplate the piece further. In some works, ethereal imagery combined with off-putting subject matter creates a space for the viewer to consider the intricacies of the self. I find enjoyment in using saturated colors in my work rather than naturalistic colors, contributing to the surreal quality. In the work I'm presenting, "Feeding the Crown when the Root no Longer Can", all of these artistic choices contribute to the topic of the piece, which is childhood memory loss, and how the adult identity can't be built upon the roots of childhood. The childhood self is depicted as a bright red figure towards the bottom of the painting, no longer supporting the tree that spreads throughout the piece. Because of this, the adult self must nurture

the identity, holding a pair of garden shears and maintaining the tree. The actions of the adult self are primarily what the identity is built off of due to childhood memory loss. Despite this, there is an undercurrent of hope within the piece, as the tree is flourishing under its new care.

Emma Grayson

Subject: Education, Learning & Training

Uncovering Students' Current Conceptual Understanding of a Topic Prior to Classroom Instruction

Uncovering students' current conceptual understanding of a topic prior to classroom instruction is important to provide equity among all students in the classroom. This includes preconceptions, naive conceptions and misconceptions. Finding out students' current understanding will support all students as they build a scientifically accurate understanding. Donovan and Bransford (2005), describe that students' "new understandings are constructed on a foundation of existing understandings and experiences" (p. 4). Keeley (2011) emphasizes the value of assessment probes, which are designed to reveal more than just the correct answer and can give instructors insight about student's thinking, scientifically correct ideas, misconceptions, partially formed ideas, and the reasoning and connections they used to make sense of their concepts. To assess students' current conceptual understanding, we used an assessment probe designed to test conceptual understanding of where trees get food necessary for growth. We administered the assessment probe to 85 seventh and eighth grade students, and 67 college students. The probe consisted of a multiple choice question followed by an open-ended response section, allowing for a deeper exploration of students' thinking. Data was analyzed to identify patterns in misconceptions and scientifically accurate explanations. We found that only 25% of the middle school students answered the assessment probe question correctly, and only 47% of the college students answered the probe question correctly. These results showed multiple misconceptions of where a tree gets the food it needs to live and grow. This study highlights that preconceptions students bring to the classroom should be addressed because if left alone, their thinking and understanding can act as a barrier in understanding the correct scientific thinking. When beginning with attending to students' preconceptions, a learning environment that prioritizes learners, content, quality assessments, and a community of learners can be established.

Isabel Harbig, Sanaly Nava, Samjhana Pradhan, Devaleena Pradhan, Claire Wasniewski, and Kavita Sharma

Subject: Biological & Natural Sciences

Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS): A Powerful Analytical Tool for Diverse Applications

Introduction/Statement of Problem: Liquid chromatography-tandem mass spectrometry (LC-MS/MS) has emerged as an indispensable analytical technique. The highly sophisticated equipment has revolutionized the landscape of chemical and biological analysis. Its versatility lies in the synergistic combination of high-resolution separation offered by liquid chromatography (LC) with the exceptional sensitivity and structural elucidation capabilities of tandem mass spectrometry (MS/MS). This unique combination of two separate techniques allows for the precise identification and quantification of a vast array of compounds within complex and diverse matrices, making LC-MS/MS a truly versatile tool. LC-MS/MS has garnered global attention for its diverse applications, extending from natural product chemistry, pharmaceutical development and clinical diagnostics to environmental monitoring and food safety. This work will explore the fundamental principles of LC-MS/MS and highlight its broad applicability across various scientific disciplines. Specifically, we will demonstrate its use in identifying secondary metabolites from Sagebrush extract, detecting metabolite changes in fecal samples for healthy aging, quantifying plasma hormones, and quantifying serum neurochemicals, thus showcasing its pivotal role in advancing our understanding of complex systems. Materials and Methods: LC-MS/MS has been utilized for the identification and

quantification of metabolites and proteomes across various matrices. Results: A variety of analytes, including metabolites, hormones, neurochemicals, and proteins, from fecal, plasma, and serum samples have been identified and quantified, enabling the exploration of various research applications. Conclusions and Future Directions: This work has effectively demonstrated the utility of LC-MS/MS in various applications. The precise identification and quantification of these metabolites and proteins highlight LC-MS/MS's capacity to deliver valuable insights in both biomedical research and natural product chemistry. Future investigations utilizing LC-MS/MS could delve deeper into the mechanisms of action of the identified metabolites or examine the impact of environmental stressors, thereby expanding our understanding in diverse areas.

Angela Hayden, Jose Tzompa, Savanah Call, Ivy Marshall, and Abbi Summerill

Subject: Engineering, Physical & Mathematical Sciences

Zeolite Catalyzed Friedel-Crafts Acylations

Friedel-Crafts acylation reactions are traditionally catalyzed using a metal halide catalyst which acts as a Lewis acid. Due to product inhibition of the catalyst, metal halides are used in stoichiometric quantities which creates large amounts of toxic waste and is harmful to the environment. By replacing the metal halide with zeolites, it is possible to make this process more sustainable. Zeolites are heterogenous, aluminosilicate compounds with micropores ranging from 0.1 - 2.0 nm and are easily recycled and safer to handle than the traditional metal halide catalysts. Our work thus far suggests that zeolite Y-hydrogen is the best catalyst for the acylation of m-xylene with benzoic acid to form 2,4-dimethylbenzophenone. Different silica to alumina ratios in Y-hydrogen zeolites, reflux time, drying agents, and nucleophile equivalences have also been explored. An expanded substrate scope is being explored with a variety of electron-donating and -withdrawing substituents on the nucleophile. Reactions with unprotected nucleophilic substrates (such as phenol and aniline) and benzoic acid have produced low conversions thus far, so we have begun to study the effect of substrate protection with silyl ether groups on conversion. Future work will consist of exploring more silyl ether protecting groups and electrophilic substrates with varying electron-donating and -withdrawing substituents as well as learning about zeolite selectivity for ortho/para products.

Ashley Helm, James Stoutenborough, and Kellee Kirkpatrick

Subject: Humanities, Behavioral & Social Sciences

The Third-Person Effect and Education During COVID

Education Policy throughout the US radically changed in response to the COVID-19 pandemic. While some of these changes were certainly controversial at the time, enough time has passed that it is necessary to take stock of the implications of these policy changes on student learning objectives and in terms of the communication between school districts and their communities. Using the Third Person Effect, a theory that explains how many individuals believe that they process information differently than other people, this project examines how students who attended high school during the COVID-19 era (2020 through 2023) evaluates the impacts of various COVID-19 policies within their local communities and on themselves. The Third Person Effect helps to explain the deviations in policy evaluations that are found.

Shannon Hendricks and Julia Martin

Subject: Biological & Natural Sciences

Magnesium Rescue of Streptococcus pneumoniae mntE Manganese-Sensitive Growth Defect

Before common treatments were created to treat and prevent Streptococcus pneumoniae infections, some estimates show that almost 95% of pneumonia infections were caused by S. pneumoniae. With an increase in treatment options, presently around 25% of pneumonia infections are caused by S. pneumoniae. However, resistance is quickly developing in many serotypes of S. pneumoniae. Emerging treatment-resistant strains have reduced the options for treating sick individuals, increasing morbidity and death. These complications are much higher in high-risk groups such as those younger than five, older than 65, and immunocompromised individuals. To develop more effective treatment, a better understanding of the bacterium's physiology must be understood. Preliminary results from our lab suggest that Mg does rescue Mn toxicity. This comes from growth curves that have been conducted. Additionally, several serial dilution drop tests have been performed which show the increased tolerance of intoxicated cells while in 1 mM of Mg. Further tests will be performed to see how the rescue changes CPS production, cell morphology, intracellular metal concentration, and other related effects.

Emma Hibler and DJ Williams

Subject: Humanities, Behavioral & Social Sciences

Private Mass Murder: How Specific Aspects Affect Familicide-Suicide Behavior Case Study

This study analyzes the familicide-suicide of the Haight family in Enoch, Utah (January 4, 2023), a rare case marked by strong religious ties and deep community involvement. While research on familicide highlights financial stress, mental illness, and family conflict, the influence of leisure, social reputation, and religious engagement remains underexplored. Using Fox and Levin's motive theory and Agnew's general strain theory, this study examines how unmet societal expectations may contribute to such acts. Findings aim to identify risk factors and prevention strategies for individuals facing similar psychological and social pressures. This unique intrinsic case study methodology employs qualitative analysis to examine the behavioral motives behind the Enoch familicide-suicide, focusing on leisure, control, and strain. Using Fox and Levin's motive theory and Agnew's strain theory, the study identifies primary motivators through thematic analysis of police reports and news articles. A coding method was applied to detect patterns related to lifestyle and social pressures, with multiple researchers independently coding data to ensure accuracy and reduce bias. Comparing findings with other familicide cases, this study aims to uncover unique contextual factors shaping the offender's actions and broader behavioral patterns. This study expects to identify patterns linking the inability to negotiate a strain to the familicide-suicide behavior process. Through focus coding, we anticipate uncovering key motives such as control and power (Fox & Levin, 1998) also focusing on spousal revenge(Liem & Reichelmann, 2014). Examining how strain and power factors influenced the offender's actions. Given the strong religious and community ties in this case—typically considered protective factors—we aim to assess whether these elements contributed to the crime instead. Repeated analysis of sub-themes will help determine reoccurring patterns, providing insights into the behavioral process of familicide-suicide. Line by line coding of primary and secondary sources coding has been done. Evidence indicates that revenge and power was a key motive. This adds to behavioral sciences because this case is different because it has strong religious factors and community involvement.

Dexter Hoffman, Hannah Lesnick, and Maria Wong

Subject: Humanities, Behavioral & Social Sciences

The relationships between executive functions and social problems in school-age children

Previous research has shown a relationship between poor executive function abilities and behavioral, emotional, and attention problems (Vuontela et al., 2013; Pieket al., 2004, Schmengler et. al., 2023). Currently, there is little research examining the relationship between executive functions and parental ratings of childhood social problems. Data were drawn from a short-term longitudinal study on sleep and health (2 time points, one year apart). Participants were 246 children (53% girls; mean age=10.21(1.41)) who completed T1; 198 completed T2 (Wong et al., 2022). Biological parents completed the Child Behavior Checklist (CBCL; Achenbach et al., 2019) at T1 and T2 to assess the child's social problems, Executive function abilities (e.g. working memory, inhibition control, cognitive flexibility) were assessed using the Delis-Kaplan Executive Functions Test Color-Word Interference Test (D-KEFS; Delis, Kaplan, & Kramer, 2001), the Wisconsin Card Sorting Task (WCST; Heaton, 1981), and the Trail-Making Test (TMT; Sánchez-Cubillo et al., 2009). Multiple regression analyses showed that T1 inhibition and motor speed scores significantly predicted social problems for the child (β= -.147, p < .05; β= -.145, p < .05). Additionally, T1 TMT motor-speed test scores were significantly related to T2 social problems. (β= -.147, p < .05). No other relationships were significant. The results from the current study support the hypothesis that children with poorer executive function abilities have more social problems. More specifically, slower motor speed and poorer inhibition abilities may be risk factors for future social problems. Children with these deficits may have more difficulty connecting with their peers in social environments, such as school, or making and maintaining friendships overall. This work was supported in part by a grant awarded to Dr. Maria M. Wong from the National Institute of Health (R01 AA020364).

Arminda Horton and Jennifer McDonald

Subject: Humanities, Behavioral & Social Sciences

Does Watching Bluey Encourage Adults to Seek Therapy?

This experiment studied whether adults who watch the popular children's television program, Bluey, had a greater openness to attending therapy. One-hundred and sixty-nine undergraduate students were divided randomly into three different groups. Group One watched a clip of Bluey, Group Two watched an equal length clip of Peppa Pig, and the control group did not watch a video. Participants were then given a self-report questionnaire about their feelings on the clip they watched and then given the "Attitudes Toward Seeking Professional Psychological Help Scale-Short Form" measure to determine their openness to therapy. Results indicate that there was almost no difference between the three groups in regards to their openness to therapy. In fact, the range of openness to therapy was mostly equally distributed across all three groups. This suggests that while Bluey incorporates mental health and coping mechanisms into its episodes, there are likely several outside factors that determine people's openness to therapy. Other factors like social conditions, mental health conditions, personal morals and values, as well as life experiences may play a larger role in determining openness to therapy. Therefore, there was no effect of watching Bluey on openness to seeking therapy.

Ferrania Huang, Emily Lindsey, Ryan Mohammed, Ascanio Rincon, and Brandon Peecook

Subject: Biological & Natural Sciences

Identification of the first fossil vertebrates described from Trinidad & Tobago: giant Ice Age armadillos (Chlamyphoridae: Glyptodontinae)

Vertebrate fossils were found in tar seeps on the island of Trinidad during the last century but were never formally described. The most abundant were remains of giant armadillos (glyptodonts), including isolated scutes, a mandible, and an articulated partial carapace and pelvic girdle from Forrest Reserves Oil Well 1060 and other localities. Beyond our goal of identifying these isolated specimens of large species, we aim to integrate them into the biogeographic history of Trinidad, which was repeatedly connected to mainland South America (Venezuela) during the Pleistocene as sea levels rose and fell. Recent work by Zurita et al. (2018) has posited that the width of the sulci of osteoderms can distinguish the genera Glyptodon and Glyptotherium. These fossils would be the first vertebrate remains described from Trinidad & Tobago. First, I obtained a permit from the Forestry Division of Trinidad and Tobago to use photographs of UWI specimens. Afterwards, the isolated scutes were scored for all relevant characters of the analysis of Zurita et al. (2018) on Pleistocene Glyptodontinae. The scutes of the specimens were rosette-shaped with a central figure and 5-6 peripheral figures surrounding it with a radial and central sulcus. Photographs of isolated scutes were measured in ImageJ by measuring the width of the sulci and out of 29 isolated scutes from FROW 1060, a total of 15 were analyzed to form this dataset. All FROW 1060 scutes were found to be consistent with the identification of known Pleistocene glyptodonts based on the phylogenetic scorings. Zurita et al. (2018) posited that the breadth of sulci is 1-2.4 mm for Glyptotherium and 4-6 mm for Glyptodon. Based on this, we found several osteoderms with sulci widths in the hypothesized ranges for Glyptotherium (n=6) and Glyptodon (n=1), but most exist “in between” the hypothesized ranges (n=8). Based on the measurement and scorings, both Glyptotherium and Glyptodon were present in Trinidad.

Parker Johnson and Cesar Garcia

Subject: Creative Works Category

Building a Geiger Counter

Cesar and I for a school project decided to build a Geiger counter. We are both in the Nuclear Operations degree path and want to operate nuclear reactors. Geiger counters are required in the nuclear industry for monitoring radiation to protect the employees from an excessive dose. Seeing how to make and the components of a Geiger counter worked seemed very applicable to our designated degree paths. We found a prebuilt procedure with the required materials needed to make a fully functional Geiger counter. We have not yet completed the Geiger counter to produce any results. This is an exciting opportunity for Cesar and I because nuclear is a very exciting industry. Learning as much as we can to help provide us with more information when we start working and running a research or commercial nuclear reactor.

Kyla Johnston and Jeremy Hernandez

Subject: Engineering, Physical & Mathematical Sciences

Improving Organism Identification in the Great Salt Lake: A Metagenomic Study of the Three Domains of Life in a Hypersaline Environment

The Great Salt Lake is home to the three domains of life; eukaryotes, prokaryotes, and archaea. The high salt concentration of the lake results in the presence of a large number of halophilic archaea in samples taken from this environment. Through the use of metagenomics, specifically the use of ribosomal RNA (rRNA) primers, it is possible to identify organisms present in environmental samples. At this point in time, available primer sets are specifically designed for the organism domains Eukarya and Bacteria. However, these organisms may not be accounted for due to the use of non-archaeal specific primer sets. Several

rRNA primer sets are being developed to identify the archaea present in samples that may have previously gone unaccounted for. Our newly developed primer sets are being tested on a wide range of environmentally found eukaryotic, bacterial, and archaeal organisms. Using a variety of metagenomic techniques, we will confirm the presence and diversity of the halophilic archaea. Through further analysis, we will be able to confirm the halophilic archaeal organisms and potentially discover new genomes that may be present in the Great Salt Lake samples. The confirmation and further use of these primer sets should help future researchers more accurately identify the organisms present in their environmental samples.

Soul King

Subject: Creative Works Category

Trans Bodies

My aim, as an artist and writer, is to create characters who could be real people. Even when a character has non-human traits, such as animal ears and tails or an unnatural skin tone, my goal is to have a major part of them that is relatable to at least one person. The person I am, the people I've surrounded myself with over the years, deserve the ability to see themselves in art and stories, which makes representation a high priority for me. My characters will have diversity in body type, skintone, race, hair texture, mental illness and disability, physical disability, gender, sexuality, and more because these are all traits that real people have. In today's climate, I think it's important to portray the variety in trans bodies and how even in fantasy settings, trans people can exist. This painting is just the beginning of what I'd like to continue to expand on, a never-ending painting of the different types of trans bodies that exist in our world and as an extension, in fantasy worlds as well.

Kailey Marler

Subject: Education, Learning & Training

Rural Secondary Teachers: The "Jack-of-All-Trades"

After a student-teaching trip to Arco, ID, on the Teaching in Rural Areas Immersion Learning (TRAIL) program through ISU, I began to notice the amount of responsibilities each staff member had. Butte County Middle/High School is a 1A rural remote school with a student enrollment of under 200. Due to its location near the INL desert, the staff size is even smaller, with more teachers wearing more hats than suburban and urban teachers I have seen before. Why would a rural teacher stay rural when there is so much to do? What can the stress do to a rural teacher? Why do rural teachers have more responsibilities? Who do rural teachers impact? Taking on multiple roles in school and in the community has many positives to it. Many studies and personal accounts explain that more outlets for professional development and an increased belonging in the community can lead to better teacher retention. Many schools across the country are the largest employers in town, creating many opportunities for work and civic engagement townwide. Yet there are downsides to wearing all those extra hats. Often, rural remote areas struggle economically. Thus, rural educators may need to take up multiple roles to keep themselves afloat, as well as keep the community running. Rural remote schools also have a more difficult time staying completely staffed than suburban or urban schools. To keep running, more teachers need to take on more classes, more students, and more roles.

Zachery McLane, Callan Norby, Mayra Lozano, Caryn Evilia, and Courtney Jenkins

Subject: Biological & Natural Sciences

Biodegradation of Sulfur-Based Polymers Facilitated by Soil Bacteria

Polymer biodegradation stands as an important focus within the interdisciplinary realms of chemistry and biology, presenting promising avenues for solving environmental concerns. Furthermore, sulfur polymers have become a major focus of polymer science, as finding usage of excess sulfur from industrial processes

could lead to more sustainable and environmentally friendly materials, while also addressing the issue of sulfur waste management. Many bacteria capable of degrading different polymers have been discovered, however these have mostly been tested on common polymers. This study investigates the potential biodegradation of sulfur-based polymers which were synthesized using inverse vulcanization. The polymers' sulfur content forces bacteria to decompose them for the sulfur essential to their survival. Pseudomonas aeruginosa and Bacillus subtilis are known for being soil bacteria and were identified as potential agents for polymer degradation because of their ability to break down complex soil nutrients. In this study, we aim to evaluate the biodegradability of these polymers when exposed to bacteria. In previous work, our lab demonstrated that P. aeruginosa may have interacted with the polymer. In this current work, the mass loss of the polymers was after a two-week exposure to the P. aeruginosa. In addition, P aeruginosa demonstrated an elongated stationary and death phase in the growth curve. As a negative bacterial control Escherichia coli K12 was tested with the polymer for biodegradation. Our results demonstrate that all decreases in polymer mass were equivalent to that of the negative polymer control and therefore no bacteria-polymer interaction was found. The findings of this research will contribute to enhancing current knowledge of biodegradation of polymer using bacteria. Moreover, this study will pave the way for developments in polymer science, particularly by pushing for the integration of sulfur into polymer structures and enabling more efficient and environmentally sustainable biodegradation.

Larisa McOmber, Kinta Serve, Zach Ditzig, Abby Hutchison, Julianne Nielsen, and Natalie Empey

Subject: Biological & Natural Sciences

Asbestos and autoimmune disease: Identifying the mouse lung citrullinome

Exposure to environmental factors such as amphibole asbestos has been linked to the development of many different autoimmune diseases. However, the exact mechanism by which amphibole asbestos contributes to autoimmune disease development has not been defined. One potential mechanism underlying these autoimmune responses may be the citrullination of plasminogen and other lung proteins. Citrullination is the post-translational modification of arginine residues in target proteins to citrulline, catalyzed by peptidylarginine deiminase enzymes (PADs). This can affect the conformation, function, and half-life of the protein. While PADs are commonly expressed in specific areas throughout the body, inappropriate expression may result in neoantigen formation and has been linked to tumorigenesis or autoimmunity. We have previously noted increased autoantibody prevalence in people and mice exposed to Libby amphibole (LA) asbestiform fibers and recently measured increased expression of PAD4 in the lungs and pleura of LA-exposed mice. Here, we examined PAD expression and citrullination in mouse lungs and pleura after either low-dose (environmental) or high-dose (occupational) LA exposure. We used both immunohistochemistry and immunofluorescent staining to visualize PAD and Citrulline expression in the lungs. We also analyzed the activity of PAD2 and PAD4 in vitro. We show the expression of PAD4 is the highest at 7 days following exposure and decreases over time, indicating that the PAD expression is an acute response to asbestos. At 21 days and 4 months post-exposure we see increased citrullination in the lung tissue. These data will provide insights into the mechanisms underlying LA-associated autoimmunity, which is likely to reveal novel therapeutic targets for these disorders. We have identified Plasminogen as one target of citrullination. This increased citrullination may be the mechanism for autoimmune disease development following LA exposure.

Ethan Moss and Ericka Christensen

Subject: Humanities, Behavioral & Social Sciences

The Impact of Psychological Images: The Case of America's Two Parties

This research examines how psychological images inform the policy preferences of America's two political parties on a cooperative-conflictual continuum. The major argument holds that if people are to manage a complex environment they are compelled to organize and simplify that environment psychologically. Understanding these cognitive processes makes it possible to gain insights into patterns of decision-making and adaptation to political change. The first part of the paper examines and utilizes image theory, a framework depicting the political world view that results from the need to organize and simplify the environment. Using this framework and the findings in psychological and political research, this work contends that several patterns of behavior should result from elements of the political world view. The second part of this paper will apply this framework to America's two political parties in terms of policy making. A growing body of scholarship has demonstrated the lack of civility and compromise present in our system currently. It points to viscous rhetoric, a lack of pride in the institutions, declining camaraderie that once existed between members of an institution. Replacing it is partisan and ideological divides with no room for reaching across the aisle or compromise. Discourse has been replaced with name-calling and in-group/out-group bias. Gridlock is no longer about slowing things down, working together to find middle ground, and pass necessary laws.

Sanaly Nava, Kavita Sharma, Samjahan Pradhan, Isabel Harbig, and Dishant Aggarwal

Subject: Health, Nutrition & Clinical Sciences

Unlocking the Neurochemical Secrets of Aging: Investigating the Impact of GABA Producing Probiotics on Healthy Aging

Aging is a gradual process of weakening bodily functions that leads to decline in physical, cognitive, and behavioral abilities. Gamma-amino butyric acid (GABA), a major inhibitory neurotransmitter in the central nervous system, is produced by both neurons and gut bacteria, and plays a crucial role in numerous physiological functions. Notably, aging is associated with a decline in GABA production and alterations in gut microbiota. Therefore, restoring GABA production by correcting dysbiosis presents a potential strategy for managing age-related functional decline. To better understand how to support healthy aging, this study investigates the gut-brain axis and the potential of genetically modified GABA-producing probiotics, specifically P8s-GAD-Lactococcus lactis (P8). We aim to determine whether levels of key neurochemicals, including GABA, glutamine, succinic acid, and glutamic acid, change with age, and explore if this probiotic strain, P8, can play a role in maintaining these key chemical messengers through its influence on the gut-brain axis. To evaluate our hypothesis, we will utilize a live, genetically modified bacterial strain, P8, to assess its impact on neurotransmitter levels in fecal matter, serum, and brain tissues. The P8 probiotic will be administered to adult, healthy SD rats via oral gavage. Subsequently, fecal and blood samples will be collected for analysis. Changes in neurotransmitter concentrations will be quantified using liquid chromatography-mass spectrometry (LC-MS/MS). We have developed the LC-MS/MS method for the quantification of the neurochemicals from the biological samples. Our goal is to understand how this probiotic impacts the intricate communication between the gut and the brain by precisely measuring changes in neurochemical levels. This knowledge has the potential to unlock novel therapeutic pathways for fostering healthy aging and alleviating age-related cognitive deficits.

Maddie Nelson, Lillian Favor, Krista Roland-Mohon, and Jessica Ward

Subject: Education, Learning & Training

Importance of Thyroid Shields

There is an argument of whether or not thyroid shields are helping or hurting patients during radiographic exams. This poster helps explore the pros of using a thyroid shield. Materials: 2 different thyroid shields. Methods: 10 different exposures which were recorded. Lower radiation doses when a thyroid shield was applied. The results show the EI dropped significantly when a thyroid shield was added into the equation.

McKenna Nield, Hailey Bybee, Joshua Coburn, and Nicole Hanks

Subject: Health, Nutrition & Clinical Sciences

The Legal and Ethical Implications of Digital vs. Lead Markers: A Literature Review

The gold standard in radiography is to have a radiopaque lead marker in the field of view for each image we take prior to exposure. Digital radiography has allowed for digital markers to be added to images during post processing after the image has already been exposed. In the study by Barry1, 400 images were evaluated. 94.2% were appropriately marked with anatomical side markers, 5.5% of images had no marker identifying right from left. Not only do the use of lead markers before exposure decrease anatomical doubt, confusion, and repeat imaging they also provide legal documentation. Digital markers will always carry a risk of error with them. The aim of this experiment is to identify and compare legal and ethical implications of using lead markers versus adding digital markers during post processing.

Riley Ortiz

Subject: Creative Works Category

Painting of the Pleistocene Epoch

I am a very visual learner and I happen to be taking the Real Monsters class here offered on campus. My husband is also very intrigued by all things mammoth. So I decided to paint what I would imagine the Pleistocene Epoch to look like with people, snowy mountains, a frozen lake, and a lone mammoth. It has made a great addition to our home and I love seeing it every morning. I am just so proud of it that I want to show it to others who love art and are also in an educational setting. I want to show it to those who I think might relate to my interest in painting this historical landscape.

Lauren Owens and Janette Olsen

Subject: Health, Nutrition & Clinical Sciences

Injury Reporting and Care Satisfaction of Collegiate Dancers in the West

Background: Collegiate dancers frequently experience injuries, yet many do not report them or receive proper medical care. Understanding the factors that influence injury reporting and patient satisfaction with medical care may support improvements in overall dancer healthcare. Purpose: This study aims to understand injury reporting behaviors and medical care satisfaction among collegiate dancers from different types of healthcare providers. Methods: A Qualtrics survey was distributed to 75 dancers across 28 universities which included items that assessed injury history, reporting behaviors, type of provider seen, satisfaction with medical care, the culture surrounding injury, and baseline demographic information. Results: Data collection has concluded, and statistical analysis is currently underway. Descriptive and inferential statistics are being used to identify trends and correlations. Preliminary data findings show varied satisfaction levels among professionals, with physical therapists being the highest-ranked professionals. Reports also indicate that many injuries go unreported. Discussion: Although the data is still being analyzed, preliminary results suggest that injury reporting among collegiate dancers remains inconsistent, and satisfaction with medical care is largely influenced by accessibility and perceived quality of treatment, with physical therapists being regarded more highly than physicians or other healthcare

providers. Conclusions: Future efforts should focus on education for both dancers and healthcare providers to improve reporting and care. Policy changes to encourage reporting may improve dancer health outcomes.

Jaden Palmer, Kayson Oakey, Christian Done, Atulan Gupta, Janet Franklin, Sidney Hagedorn, and Marco Schoen

Subject: Engineering, Physical & Mathematical Sciences

Reinforcement Learning for Upper-Extremity Trans-Radial Prosthesis Actuation

Robotic prostheses can greatly increase the quality of life of an individual who has experienced loss of limb. While these prosthetics may never be able to fully replace the sensation of the user's missing limb, they can greatly increase their capability of performing day-to-day activities. Apart from movement capacity, actuation of the prosthesis's dimensions and orientation play a key role in the user's ability to perform tasks using their prosthetic device. Due to differences in individuals, we presume that creating personalized prostheses can improve everyday activities by modification of the prosthetic device's dimensions, actuation, and movement capacity. Artificial intelligence, particularly in the form of reinforcement learning (RL), may serve as a solution to automating this process with minimal human intervention. To optimize the rotations of components of an upper-extremity prosthetic limb (i.e. finger and hand rotations) an augmented reality (AR) application, which utilizes electromyography, in the form of an armband, and reinforcement learning was created. The AR application employs Unity's Machine Learning (ML) Agents algorithm which provides a punishment/reward system to actuate the prosthetic device over a certain length of learning steps when performing a grabbing motion. We expect that reinforcement learning can effectively optimize prosthetic actuation by enhancing usability in real-world tasks. The ML-Agents results are to be compared to optimal rotation results which were manually found. The initial results of this study feature the actuation of prosthesis components through an automated grabbing motion as a proof of concept. Future work of this study includes adding human motion to this RL training process, formally termed human-in-the-loop machine learning. This work presents a novel RL method, as the episode length during the training period is centered around the participant's actions, allowing the user to obtain an individualized prosthetic.

Kyle Price, John Morrison, Stephani Haun, Ian Fehrenbacker, Braxton Bigelow, and Curt Anderson

Subject: Biological & Natural Sciences

Muscle Recruitment and Fatigue in the Biceps: An EMG Analysis

Muscle recruitment and fatigue are critical factors in understanding neuromuscular performance, with implications for rehabilitation, athletic training, and injury prevention. While electromyography (EMG) has been widely used to assess muscle activation, most research has focused on individual muscle groups rather than direct comparisons between them. Studies have analyzed recruitment patterns in muscles such as the biceps brachii and quadriceps femoris during various types of exertion, but few have examined their activation strategies under sustained load until fatigue within the same experimental framework. Additionally, while prior research has explored how these muscles behave in response to different loads, there remains a gap in understanding how recruitment and fatigue patterns compare across different muscle groups under identical fatigue-inducing conditions. This study aimed to address this gap by analyzing the muscle recruitment patterns of the biceps brachii under sustained load until fatigue. EMG electrodes were placed on key areas of the biceps, and participants performed resistance exercises at a percentage of their maximum weight, with EMG data recorded continuously until the point of fatigue. By investigating how the biceps respond to sustained exertion, this study provides insight into recruitment strategies and fatigue resistance, contributing to a broader understanding of neuromuscular function. The findings may have applications in optimizing training pro

Hyrum Redd and John Kalivas

Subject: Engineering, Physical & Mathematical Sciences

Immersive Analytics: Human-Machine Hybrid Approach with Virtual Reality for Detecting Outliers

Immersive analytics is a machine-human hybrid approach to data analysis where the user experiences and utilizes sensory representations of chemical data for cognitive decision making, looping the decision results back to the machine. An example explored in this presentation is the use of virtual reality (VR) data objects for 3-dimensional (3D) exploration. Specifically, a hybrid human-machine data analysis approach is developed for outlier cleaning training data sets synergizing the expert computation skills from computers with the naturally developed pattern identification and cognitive reasoning abilities from humans. Key to analyzing the data and computation results in VR is the use of glyph objects to represent each sample with unique glyph features characterizing each sample. These features are the basis for determining outlying samples within the dataset covariance domain. Glyph features are developed using hundreds of similarity measurements between samples based on their spectra (X-glyphs) and prediction property values (Y-glyphs). These similarity values appear on spherical VR glyphs as spikes, with larger spikes representing a greater degree of dissimilarity for the sample compared to the rest of the training set for corresponding similarity calculations. A fusion of all the similarity values is represented in the size of the spherical part of the glyph, with larger glyphs being overall more dissimilar to the rest of the set. Once in VR, glyphs can be visually and spatially compared to each other by the user, with human cognitive reasoning being the determining factor for outlier removal. Results show this method of outlier cleaning produces datasets that generate improved partial least squares (PLS) model predictions compared to the same datasets cleaned via an autonomous algorithm. Although outlier cleaning is among the simplest processes to integrate into the hybrid human-machine data analysis domain, further implementation of immersive analytics for other processes are ongoing.

Nicole Sacco, Jaycie Belnap, and Bobbie Cunningham

Subject: Biological & Natural Sciences

Breast Dose and Lead Aprons

Radiologic technologists are routinely exposed to scatter radiation, this increases the concern about long-term health risks, particularly breast tissue exposure. While lead aprons are a standard protective measure, their effectiveness in reducing scatter radiation exposure to sensitive tissue remains an important area of study. This research investigates the impact of lead shielding on scatter radiation exposure at varying distances from the radiation source. Building upon previous studies that have indicated occupational radiation exposure to increased breast cancer incidence in female technologists, we aimed to measure the effectiveness of lead aprons in reducing scatter radiation. We used an 8x10 Computed Radiography (CR) plate, we conducted multiple exposures at three distances: close to the patient, in the middle of the room, and near the door. Measurements were taken with and without lead shielding to compare scatter radiation levels. Our findings indicated that the highest scatter radiation exposure occurs closest to the patient, with 1.9 IgM recorded without lead and 1.4 IgM with lead. As the distance increased, scatter radiation levels decreased. The use of lead shielding reduced radiation exposure at the increased distances, demonstrating how effective it is. Our results highlighted the necessity of using well-fitted, two-piece lead aprons for optimal protection. Future research could further explore additional protective measures, such as lead sleeves, to enhance safety for radiologic technologists.

Darious Salas, Dillon Stevens, and Kinta Serve

Subject: Biological & Natural Sciences

Asbestos Induced Autoantibodies Inhibit the Effects of Plasminogen in Pleural Mesothelial Cells

Recently, anti-plasminogen (aPLG) antibodies were described in people with fibrotic autoimmune disorders and with asbestos-associated pleural fibrosis. Plasminogen (PLG) is an important protein in regulating cellular functions and extracellular matrix (ECM), and compromises of this pathway may lead to collagen build-up and fibrosis. We recently demonstrated that PLG and aPLG bind to mesothelial cells, the main cellular component of the pleural cavity, and a key site of asbestos-related disease development. Therefore, we suspected that aPLG binding blocks PLG activation, thus preventing normal mesothelial cell responses and promoting fibrosis. Here, we used cell culture models to investigate mesothelial cell responses to PLG or aPLG binding and examined the pathways associated with these changes. We specifically examined responses previously implicated in fibrosis, including cell migration, collagen deposition, extracellular metalloproteinase activity, and gene expression. Our results demonstrate that aPLG binding block activation of PLG, thus reducing mesothelial cell migration and promoting collagen deposition through activation of the collagen-remodeling protein Lysyl Oxidase-like 1(LOXL-1). Further, transcriptome data showed significant changes in gene expression following mesothelial cell exposure to PLG, including changes in extracellular matrix reorganization, though aPLG binding did not alter gene expression compared to PLG alone. Together, these data suggest that the observed cellular responses and increased collagen deposition following aPLG binding is largely due to changes in extracellular protein activity. Thus, our future research will examine the mechanisms underlying LOXL-1 expression and secretion in mesothelial cells, which may provide a therapeutic target for reducing or reversing asbestos-associated pleural fibrosis.

Jessica Salisbury and Jennifer Lee

Subject: Health, Nutrition & Clinical Sciences

To Shield or Not to Shield: How effective is gonadal lead shielding in reducing scatter radiation dose to patients during x-ray procedures?

Radiography has evolved immensely with the flow of technology, which has led to changes in shielding guidelines by different organizations. Thanks to the evolution of technology, pelvic organ dose has decreased by 95% since the 1950s.1 The American Association of Physicists in Medicine and the American College of Radiology recommend reducing the use of gonadal lead shielding during exams when shielding interferes with the anatomy of interest.2 Certain studies have determined that shielding provides little to no benefit, despite previous concerns of birth defects and infertility. Some argue that shielding can obscure useful data, increase repeats, thus increasing patient dose.2-4 No evidence has been found that routine medical imaging radiation damages the gonads.4 The American Society of Radiologic Technologists (ASRT), released a statement regarding this, stating that shielding should still be a medical practice in radiography, as long as it does not interfere with the anatomy of interest. Acknowledging there is a limited benefit, it is still best practice to reduce risk of radiobiologic activity, increase patient comfort, patient confidence.5 In this experiment, PA chest and AP Towne's skull exams were simulated through the use of computed radiography (CR) plates, digital radiography (DR) plates, phantoms, and lead shields to measure exposure. Based on our findings, shielding does create a barrier from scatter radiation reaching the patient. Overall, our experiment demonstrates that radiation is decreased 4 to 5 times when using gonadal shielding. This is still a big difference even using DR imaging and using correct and current techniques. DR still scatters enough radiation to unnecessarily radiate the pelvic region. We recommend using gonadal shielding when possible in appropriate exams in order to protect the patient from scatter radiation.

Ingrid Sandoval Mendoza

Subject: Health, Nutrition & Clinical Sciences

'Holy Anorexia': Examining the Role of Religiosity as a Positive or Negative Factor for Eating Disorder Development Among Latine Women Within a Southeastern Idaho Education Institution

When looking at eating disorders (ED: singular; EDs: plural) like anorexia nervosa (AN), binge-eating disorder (BED), bulimia nervosa (BN), and orthorexia nervosa (ON), there exist multiple factors that can positively and negatively influence their development. While literature exists on how religious beliefs help individuals cope with these diagnoses in the Western population, the same cannot be said for minority groups coming from Latin America into the United States. With eating disorders increasing in awareness throughout the COVID-19 pandemic, Christianity and Catholicism are an avenue to consider to see if these religions influence the progression or reduction of symptoms. Specifically among Latine women who lean heavily on their strong cultural, religious, and family values. The purpose of this study is to begin to understand how religiosity impacts Latine individuals with an eating disorder positively and/or negatively. Influences that are to be observed within religion are themes like religious commitment, concepts of the 'thin ideal' and 'holy anorexia,' and the relationship and/or expectations women have towards God. Non-religious influences include femininity and familial support. Distributing a bilingual quantitative questionnaire to the university students of Pocatello, we will be able to reach the Latine population, discovering if any of the religious factors influence the increase or decrease of developing eating disorders.

Andrija Sevaljevic, Kaden Marchetti, Alex Diviney, Caleb Eardley, Russell Phillips, Rajiv Khadka, Daniel Igbokwe, and Paul Bodily

Subject: Education, Learning & Training

Redux: An Interactive, Dynamic Knowledge Base for Teaching NP-completeness

Whereas interactive dynamic visualization tools have been successfully developed and used for teaching some topics in computational theory (CT), there remains a noticeable lack of such tools for teaching NP-completeness which continues to be widely taught using paper-and-pencil methods. Despite its important theoretical and practical value, NP-completeness-and mapping reductions in NP-completeness in particular-tends to be a challenging concept for CT students to understand. We present an open-source web app called Redux that provides a dynamic interactive user interface atop a practical knowledge base of NP-complete problems, reductions, and solution algorithms. A key feature of the interface is the visualization of arbitrary problem instances, mapping reductions, solutions, and gadgets-including those reachable via transitivity. The web app is designed to make the knowledge base extensible, allowing students to contribute and compare their reductions and solutions to those already available. Two surveys were administered, with respondents overwhelmingly indicating that Redux helped them to better understand mapping reductions; that they would prefer using Redux to solve similar problems manually; and that Redux makes learning NP-complete reductions more enjoyable. Redux is accessible online via https://redux.portneuf.cose.isu.edu/.

Prem Shah and Soubantika Palchoudhury

Subject: Engineering, Physical & Mathematical Sciences

Novel Light Absorbing Semiconductor Materials with Multinary Copper Chalcogenides

Photovoltaics and particularly thin film solar cells have emerged as key contributors for clean energy over the past decade. There is a continuous thrust for new and more sustainable absorber layer materials for thin film solar cells that can enhance the efficiency of the solar cells and catalyze next-generation technological advancements. To this end, we report the synthesis and a combined experimental and theoretical investigation of the electronic structures of a new family of multinary Cu-chalcogenide-based

semiconductor nanocrystals, Cu2ZnASxSe4-x (A: Al, Ga, In; 0<x<4). The multinary Cu-chalcogenide nanocrystals, synthesized via a modified hot-injection route, exhibit a tunable band gap in the visible range (i.e., 2.12 – 3.12 eV) and a wurtzite crystal phase. A detailed material characterization of the new nanocrystals was conducted via a combination of x-ray diffraction, scanning and transmission electron microscopy, scanning electron microscopy-energy dispersive x-ray, ultraviolet-visible spectroscopy, and photoluminescence spectroscopy. In addition, the electronic structures of the new multinary semiconductor materials were predicted via density functional theory calculations with SCAN, meta-GGA, and HSE06 hybrid functionals in conjunction with VCA approximation. The results provide a fundamental understanding of the structure-property rations of the new semiconductor nanocrystals for solar cell applications.

Pramesh Shah, Razat Sangraula, and Koras Koirala

Subject: Engineering, Physical & Mathematical Sciences

Crack detection of building infrastructure using AI applications.

The application of machine learning in image segmentation has gained significant traction for identifying structural defects. This project leverages the SYNTHIA dataset to develop a model for detecting wall cracks using high-resolution images, enhancing defect detection accuracy for improved maintenance and safety in building infrastructure. Traditional methods are time-consuming and prone to human error. With increasingly complex modern architecture, automated solutions are essential for timely hazard identification. This project focuses on accurately segmenting and identifying wall cracks using convolutional neural networks (CNNs) and data augmentation strategies. By employing the SYNTHIA dataset, we aim to create a compelling narrative around automated detection systems, improving crack detection models while raising awareness of machine learning's potential in structural integrity assessment. 1. Dataset: SYNTHIA dataset with pixel-level annotations as training foundation. 2. Image Acquisition: High-resolution frames from advanced imaging technology. 3. Preprocessing: Normalization and augmentation for improved generalization. 4. Model: Convolutional neural network implementation. 5. Training: Model trained on segmented SYNTHIA dataset subset. The anticipated outcome is a segmentation model capable of accurately identifying and localizing wall cracks. Preliminary results will assess the model's effectiveness in real-world applications. This project demonstrates machine learning's potential in revolutionizing infrastructure safety through automated crack detection. By utilizing the SYNTHIA dataset and advanced imaging, we contribute to structural health monitoring, with future work potentially exploring additional datasets and transfer learning to enhance model robustness.

Mason Sistrunk, Leslie Nickerson, Amina Elora, and Greg Johnson

Subject: Engineering, Physical & Mathematical Sciences

Hydrolysis of Esters Using Zeolites as Acid Catalysts

Traditional ester hydrolysis reactions use large amounts of water along with the help of a strong acid or base to catalyze the reaction. These typically tend to be Brønsted-Lowry acid and bases. With the use of these acids and bases, there is a large amount of corrosive aqueous waste generated. Zeolites have been shown to be highly adaptable alternatives to traditional Lewis acid catalysts and are more sustainable due to their easy recovery and reactivation and minimized waste stream. Zeolites are also suitable for flow reactors which are favored in industry over batch reactions which improves the applicability for industrial purposes. This project aims to adapt the homogeneous process to a heterogeneous reaction to reduce waste and provide a reusable catalyst while still achieving the same high-yield results as traditional hydrolysis reactions. Currently these reactions are yielding up to 60% hydrolyzed product. The recyclability of the zeolites is also being tested. Future research aims to expand the substrate scope and identify the most efficient process for zeolite recovery and reactivation as well as to test the reaction in a flow system to determine the method's viability in industrial settings.

Aubrey Skinner, Alleyna Martes, Aimee Bozeman, and Michele Brumley

Subject: Humanities, Behavioral & Social Sciences

Sensorimotor Reflexes in Adult Rats Following a Neonatal Spinal Cord Transection

Approximately 18,000 Americans sustain spinal cord injuries (SCI) each year, resulting in impairments in autonomic processes and sensorimotor behaviors, such as reflexes. To better understand the long-term effects of neonatal spinal cord injury in reflexes in adult rats, postnatal day 1 (P1) rat pups received a low thoracic (T8-T10) spinal cord transection or a sham (control) operation. On postnatal day 50 (P50), testing was performed for three reflexes: righting, placing, and crossed-extensor. For the righting reflex, rats are placed supine and then released. Once the rat has returned to a prone position with its weight centered, the reflex is complete. For placing, a stimulus (metal spatula) is applied to the top of one of the hindlimb paws. Response to this reflex is displayed when the rat picks up the hindlimb and places it onto the spatula. For the crossed extensor reflex, a hindlimb is lightly pinched with metal forceps. Although this reflex typically vanishes by adulthood, a response is measured if/when the rat withdraws the pinched paw and then extends the contralateral hindlimb. Results showed no effect or interaction between treatment conditions (transects and shams) and response for all three reflexes. Findings suggest that, unlike in younger rats, spinal-mediated reflexes may degrade over time. Other sensorimotor behaviors, such as locomotion, may provide a better assessment of recovery than reflexes.

Victor Sklenka, Brandon Walker, and Kade Burch

Subject: Health, Nutrition & Clinical Sciences

Vertical Ground Reaction Forces Experienced During Various Foot Strike Patterns

The purpose of this study is to explore the relationship between foot strike patterns and the vGRFs experienced by the lower leg during running. It will also aim to analyze the ability of IMUs to measure loading of the lower leg during running, and if they are accurate enough to differentiate vGRFs between varied foot strike patterns.

Taylor Stacey

Subject: Humanities, Behavioral & Social Sciences

Religiosity related to Sex Education

When it comes to research on the topic of how religiosity affects sex education there is a lack of information with more research being published about the effects of teaching comprehensive sex education. A survey is conducted to observe how what religion individuals grew up with has impacted what sex education they received. Additionally, gender differences were assessed for those in support of comprehensive sex education. The main goal is to observe whether there are differences in preference for sex education type being taught in schools based on religiosity and gender measured through the survey. Religiosity was measured by asking participants how religious they believe they are on a scale from 1 to 5 with 1 being not religious and 5 being very religious with slide being an important part in their life. Gender will be measured by using a multiple choice with three different options: female, male, and non-binary or third gender. Sex education preference will be asked by using a 5-point Linkert scale. Sex education experience in schools will be measured by a series of yes or no questions to determine what topics the individual was taught. Participants were gathered by distributing the survey to professors at Idaho State University to give out to students taking their classes. Results will be discussed. The survey is designed to fill in the gap in research to show how religion and gender affect perceptions on sexual education.

Adam Storms and Shanae Brachtl

Subject: Engineering, Physical & Mathematical Sciences

Materials Development for In-pile Peak Temperature Monitoring

Internal temperature of nuclear reactors is difficult to determine due to the extreme temperatures and radioactive nature inside the core. Traditional thermometers can be damaged inside nuclear reactors and specialized instruments are required to monitor the temperature internally. To address this issue, the temperature inside a nuclear reactor can be monitored with melt wires, wires that have a specific melting point. Melt wire thermometers are placed in the reactor such that they can be viewed by a remote observer, and when they melt, the observer knows that the reactor temperature has reached the melting point of the melt wire. The purpose of our project was to fabricate melt wire materials for monitoring nuclear reactor temperatures. Iron-antimony (Fe-Sb), silver-copper (Ag-Cu), and silver-antimony (Ag-Sb) alloys were to be investigated as candidates for melt wires that have a melting point in the 700-900oC temperature range. Investigations were initiated in an attempt to produce the alloys employing both a magnetron sputter system and by direct melting of the constituents. The creation of a standard operating procedure for reproducible production of alloys of specific compositions with the magnetron sputtering system was first launched. Once completed, attempts to fabricate the Fe-Sb, Ag-Cu, and Ag-Sb melt wire materials with the magnetron sputter system were initiated. A procedure was also developed to fabricate the Ag-Cu melt wire material by melting silver and copper particles at the atomic composition of its eutectic point. The atomic compositions of the deposited materials were determined through the use of Energy-dispersive X-ray Spectroscopy (EDS) while the melting point was determined by Differential Scanning Calorimetry, (DSC). Results from the preliminary investigations together with an analysis of the accuracy and reproducibility of the data will be presented.

Mya Vanderpool, Aramina Goodwin, and Andrew Holland

Subject: Engineering, Physical & Mathematical Sciences

Synthesis and comparison of zinc thiolate complexes as potential precursors for CZTS semiconductors.

CZTS (a Cu_2ZnSnS_4 crystal) has the potential to become an important semiconductor with applications in thin film solar cells and displays. One of the most attractive aspects to CZTS is that it is composed of earth abundant, cost effective, and non-toxic elements, unlike its predecessors like cadmium telluride (CdTe). One of the drawbacks of this material is the relative difficulty of synthesizing it. The purpose of this project is to create building blocks from each metal center, so that they can be assembled into larger precursors that decompose into CZTS in a more controlled manner than a mixture of discrete salts would. The focus of this presentation is on the zinc thiolate precursor and how the building block might be accessed in a cost-effective, scalable, safe, and easily controllable way without much waste. The purpose of this project is to create building blocks from each metal center, so that they can be assembled into larger precursors that decompose into CZTS in a more controlled manner than a mixture of discrete salts would. The focus of this presentation is on the zinc thiolate precursor and how the building block might be accessed in a cost-effective, scalable, safe, and easily controllable way without much waste.

Georgia York, Joshua Pak, and Kinta Serve

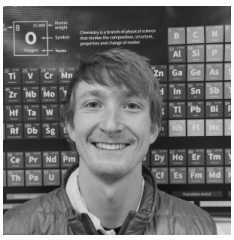
Subject: Biological & Natural Sciences

Impact of Microplastics on Macrophage Toxicity and Phagocytic Activity

Macrophages are an integral part of the innate immune system as they can ingest and destroy foreign particles including microplastics. Microplastics are defined as plastics between 100 nm and 5 mm in size and may potentially have toxic effects, especially in cells like macrophages that ingest these particles. Based on previous studies, we hypothesized that exposure to smaller sized microplastics would result in more macrophage damage. To test this hypothesis, we performed in vitro cell toxicity studies using plastic

microparticles derived from degradation of the parent plastics polyurethane (1,4-diisocyanatobenzene and named JP3 for this study) or Kevlar (and benzene-1,4-diamine and named JP5 for this study). Polyurethane was chosen because it is known for its hazardous composition and Kevlar was chosen due to it being an aramid that is non biodegradable. For our study, RAW 264.7 mouse macrophages were exposed to JP3 or JP5 at the concentrations 50, 100, 150, and 200 µl/cm2. After approximately 24 hours of incubation with the microplastics, we assessed macrophage cytotoxicity using an LDH assay and cellular function using a phagocytosis assay. Overall, it was found that the highest levels of toxicity occurred at 50µl and 200µl/cm2 for both JP3 and JP5. Similarly phagocytic activity was decreased at both 50µ/cm2 and 200µl/cm2 in preliminary studies of JP3, and it is expected to be similar for JP5. These results show that microplastics are the most harmful to macrophage activity following exposure to the lowest and highest concentrations of the plastic, though more studies are needed to examine the mechanisms underlying these observations.

Fall 2024 Three-Minute Thesis Winners



Callan Norby

1st Place

Chemistry - MS

Novel Sulfur-Rich Hydrogels and Their Applications in Agriculture

Arifa Islam Champa

2nd Place

Engineering & Applied Science - PhD

Beyond the Hype: A Reevaluation of Effectiveness of Machine Learning and Deep Learning in Phishing Email Detection

MD Fazle Rabbi

3rd Place

Engineering & Applied Science - PhD

Fact or Fiction: Do SBOM Tools Truly Identify Software Components and Vulnerabilities?

Dallin Stokes

People's Choice Award

Microbiology - MS

Overwriting Code: TwinPE in Malaria Parasites

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