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# Spokane Intercollegiate Research Conference 2017

Gonzaga University

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**Spokane Intercollegiate  
Research Conference  
Gonzaga University  
April 21<sup>st</sup> – 22<sup>nd</sup>, 2017**

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This year's Spokane Intercollegiate Research Conference is sponsored by the Office of the Dean of the College of Arts and Sciences and the Center for Undergraduate Research and Creative Inquiry.

WELCOME FROM JEFF WATSON,  
DIRECTOR OF THE CENTER OF UNDERGRADUATE RESEARCH AND CREATIVE INQUIRY

Dear Conference Participants,

It is my distinct pleasure to be able to welcome you to Gonzaga University for the 14<sup>th</sup> Annual Spokane Intercollegiate Research Conference (SIRC). This year, students from Gonzaga University, Whitworth University and Eastern Washington University will be presenting their research in a wide range of fields from the arts, the humanities, social sciences, natural sciences, engineering, and many others. This truly is an extensive cross-section of the terrific scholarly and creative work being done by students, often in collaboration with faculty mentors. On behalf of the Gonzaga community, thank you for your efforts, your dedication, and your excitement to be sharing this work with all of us.

I want to take a moment to thank the individuals who have been instrumental in organizing this year's conference. Without their efforts, this event would not exist. First and foremost, thanks go to Theresa Hauenstein, whose good humor and organizational genius have been invaluable. Other individuals who have been extensively involved in the planning process include Jennifer Klein, Vik Gumbhir, Claudia Bucciferro, Jimmy Smith, Osasere Evbuomwan, Angie Hinz, Patrick Ferro, and Rick Cangelosi. Thank you also to the many faculty sponsors for their efforts in working with the students presenting this weekend, and to the many faculty who have offered their time to serve as moderators of the oral sessions. Finally, thank you to our student volunteers, all of whom are researchers in their own right. These individuals have all presented research at conferences and meetings around the country this year, and should be applauded as well. The Center for Undergraduate Research and Creative Inquiry (CURCI), which sponsors this year's conference, was instituted in June of 2016 to support, celebrate and advance the culture of undergraduate research particularly in Gonzaga's College of Arts and Sciences. Undergraduate research, however, is bigger and more important than any single academic unit or even any single university. The abundance of student research being presented this weekend is concrete evidence of that. Student-driven research and creative inquiry is one of the most powerful practices on a college campus, and the benefits of these activities have been shown time and again. I want to say to our presenters that by your participation in scholarly and/or creative work, you are part of a larger community worldwide that will be instrumental in making our world a better place. Thank you.

Please enjoy the events this weekend. Please visit the many posters, attend as many of the oral sessions as you can make it to, and join in the discussions that arise. As a community, discourse and discussion between participants and attendees deepens the experience for us all.

Sincerely yours,



Dr. Jeff Watson  
Director, Center for Undergraduate Research and Creative Inquiry  
Associate Professor, Department of Chemistry and Biochemistry

**2017 Spokane Intercollegiate Research Conference (SIRC) Mission Statement**

SIRC is committed to promoting excellence in undergraduate research from all disciplines.

SIRC serves as a venue for undergraduate researchers from any discipline to present their scholarly research to their fellow students and scholars in and beyond their discipline.

SIRC provides disciplinary-specific guidelines to help undergraduate researchers develop their conference presentations.

SIRC fosters meaningful mentoring relationships between faculty and undergraduates.

SIRC fosters collaboration among Spokane area universities and community colleges.

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**The 2017 Spokane Intercollegiate Research Conference  
was planned by the following faculty and staff:**

Claudia Bucciferro, Gonzaga University  
Richard Cangelosi, Gonzaga University  
Osasere Evbuomwan, Gonzaga University  
Patrick Ferro, Gonzaga University  
Vikas Gumbhir, Gonzaga University  
Theresa Hauenstein, Gonzaga University  
Angela Hinz, Gonzaga University  
Katey Roden, Gonzaga University  
Jimmy Smith, Gonzaga University  
Carolyn Von Muller, Gonzaga University  
Jeff Watson, Gonzaga University  
Jennifer Klein, Gonzaga University, Class of 2017

**Funding and administrative support for this year's SIRC has been provided by:**

Gonzaga University's College of Arts and Sciences Dean's Office  
Gonzaga University's Center for Undergraduate Research and Creative Inquiry

**SPOKANE INTERCOLLEGIATE RESEARCH CONFERENCE**  
**April 21<sup>st</sup> – 22<sup>nd</sup> --- Gonzaga University**  
**SESSION SUMMARIES**

**Friday, April 21<sup>st</sup>, 2017**

**Poster Session 1: 2:00pm-3:45pm**

**Lobby/Hallway**

- F101 Jack Gallagher: Evaluation of Lignocellulosic Biomass Combustion
- F102 Riley Meister: Developing and Analysis of a zinc-responsive lanthanide complex for early detection of prostate cancer vis PARACEST MRI
- F103 Sarah Byquist: Radical SAM Enzymes Involved in Compatible Solute Biosynthesis
- F104 Kevin Brandecker: Investigation of a novel route for para-amino benzoic acid biosynthesis in Chlamydia
- F105 Curt Wong: Towards Supramolecular Catalysis via Cucurbit[8]uril Host and a Transition Metal Cofactor
- F106 Alexandra Cumings: Exploring the Effects of Suicide Inhibition on Burkholderia cenocepacia HMG-CoA Reductase
- F107 Diana Karlova: Development of Dual-Modality Lanthanide Complexes for Biomedical Imaging Applications
- F108 Alyssa Arellano: Computational Analysis of Cellulose Combustion
- F109 Benedict Beam: Development of Nanodisc Modified Stationary Phases for Bioaffinity Chromatography
- F110 Karina Lopez-Damian: Determining the Activation of the Bacillus subtilis Stressosome by RsbRA Protein Phosphorylation Levels under Stress
- F111 Jean-Claude Abboud: Using Computational Methods to Model Burkholderia Cenocepacia's Moriphein Protein, HMG-Coa Reductase
- F112 Christopher B. Usi: The Reductive Formation of a Key Dialdehyde in a Fluor lactate Synthesis Pathway
- F113 Ryan Francis: New Ideas in Oxidative Side-Chain Coupling
- F114 Annie Gibson: Identification of Proteins Associated with RquA in the Biosynthesis of Rhodoquinone
- F115 Cooper Vincent: Investigating an Acyl Anion Equivalent via the Deprotonation of Nucleophilic Activity of 4-phenyl-2,6,7trioxabicyclo[2.2.2]octane

**Poster Session 2: 4:15pm-6:00pm**

**Lobby/Hallway**

- F201 Darby McMillan: Identifying Areas of Courtship Pheromone Production in Desmognathus ocoee
- F202 Linnea Howard, Emily Korf: Do Precipitation and Temperature affect the Habitat Usage of Brooding Sage-Grouse?
- F203 Jesslyn Bierman: Investigation of Solvent Vapor Exposure on the Viscoelastic Properties of Injection Molded Acrylonitrile Butadiene Styrene (ABS)
- F204 Derrick Cordice, Kellie Waszak, Elena Smith, Morgan DeRuyter: Hemodynamic Response to Blood Flow Restriction During Exercise Using Thigh Blood Pressure Cuffs
- F205 Olivia Zertuche: Stupid F\*king Bird
- F206 Riley Schumm: Education and the Spokane River Project
- F207 Bennett Minnie: The Effects of a Barrier and Maximal Jump Height on Basketball Shot Mechanics in Males
- F208 Nicolas Quiroga: The Effects of Branch Chain Amino Acids in Delaying Central Fatigue
- F209 Elena Smith: Electromyographic Analysis of the VMO/VL Ratio on Stable vs. Unstable Surfaces
- F210 Cassidy Johnston, Dakota Klamovich: Weight Response in Sprague-Dawley Rats Under the Introduction of Diet Coke Containing Aspartame and Regular Coca-Cola
- F211 Madison Kincaid: Alcohol Use in Adolescents and Young Adults with First-Episode Psychosis
- F212 Sophia Oswald: Gratitude and Our Planet: Changing Behaviors
- F213 Emily Schneider: The Christian Identity Movement: Theological Bigotry and Hate
- F214 Lauren Wright: From parents to current partners: How college students understand romance, intimacy and family
- F215 Talena Kelln: Empathy and Brutality in "The Pillowman"

**Room 109**

- F216 Steven Anderson: Investigating the Role of the Uncharacterized Yeast Mitochondrial Protein Ylr283w in Proline Metabolism
- F217 Elijah Varner, Riley Loudenback: Effect of Music Therapy on the Acute Stress Response of College Students
- F218 Emily Walzer: Seasonal vegetative variations in greater sage-grouse habitat in Lincoln County, WA, Lake County, OR
- F219 Anna Astrom: The Contradictions in Alcohol Education and How They Affect Young Adults in America Today
- F220 Dominic Soares: Removal of Periodic Noise and Motion Blur from Digital Images in MATLAB Using the Fourier Transform
- F221 Maggie Harger, Cailyn Connelly: Riparian Zone Restoration Along the Spokane River
- F222 Hannah McCollum: History and Impact of Central America Study and Service Program
- F223 Marielle Manila: Developing a real-time simulation program to improve patient care quality and safety

**Room 111**

- F224 Connor Murray, David Goltz: Wood Duck, Aix sponsa, Real Estate: A Look at Home Buying in the Coeur d'Alene and Pend Oreille Wildlife Areas
- F225 Britta A Pihl: Analysis of the combustion of lignocellulose biomass and the resulting carbon based products
- F226 Molly Steck: Colorful Purification Lab for Organic Chemistry
- F227 Nate Porter, Chris Dinunzio, John Van Scoy, Derrick Cordice: Kinematic and muscle activation differences between a standard-pull up and a dynamic CrossFit 'kipping' pull-up
- F228 Abigail Gress: Gender Identity: A Comprehensive Look at Spanish Male Gender Identity in The Public Sphere
- F229 Kellie Waszak: Does a Split-Step Affect a Baseball Player's Force Production, Muscle Aviation, and Overall Reaction Time?
- F230 Briana Ledoux, Chris Daniels: Positionally scanned peptide libraries for exploring selective binding of CGRP analogs for CLR:RAMP1

**Room 122**

- F231 Elizabeth Grainey, Cyla Sparks, Ian McGowen, Vina Tran, Ashley Beausoleil, Jerry Sicalo: Mycobacteriophage Sensitivity and Insensitivity
- F232 Rebecca Casey: Determination of Calcium and Phosphorous Levels in Riparian Sediment at the Verbrugge Environmental Center, near Spokane, WA, USA
- F233 Daniel Padrnos: A Series of Pressure Loss Curves Following Absorption in an Ovonic Metal Hydride Canister
- F234 Devon Clements: Decadent Immersion
- F235 Jason Oestreicher, Wenni Zhao, Amberlyn Olsen: Increasing the Educational and Recreational Value of the Spokane River: A Study of the Logan Neighborhood
- F236 Jennifer Klein: Family Life, and Career After Graduation: Can You Have It All?
- F237 Luke Wilde: A Simple, Web-based Tool to Monitor Spring Waterfowl Migration in the Channeled Scablands of Eastern Washington

**6:00 PM – 7:20 PM****Dance and Performing Arts Presentation, Theatre and Dance Studio Building**

- D101 Elaina Pignolet, Angelica Gomer: Loie Fuller and the Collaboration of the Arts at Gonzaga
- D102 Molly Foster: Crafting personal and national identity through dance
- D103 Janine Warrington: Our Legacy from the Past

**Saturday, April 22<sup>nd</sup>, 2017****9:00 AM****Oral A****Room 103**

- OA1 Kailee Haong: Behind Bars: The Capitalistic Struggle in Orange is the New Black
- OA2 Kailey Rice: Diminishing Female Sexuality: The Issue of Heterosexual Pornography
- OA3 Sarah Ghods: A Feminist Interpretation of Hamilton: An American Musical

**Oral D****Room 104**

- OD1 Macy Conant: Are We Really All in This Together? Race and Gender in the High School Musical Trilogy
- OD2 Kurt Wohlers: John Stewart, Stephen Colbert, and the Changing Political Conversation in America
- OD3 Morgan Smith: Legally Blonde: Female Empowerment or Perpetuation of Female Stereotypes
- OD4 Joshua Jacobs: The Dark Knight and Myth: The Archetype Gotham Deserves and We Need

**Oral G****Room 111**

- OG1 Nicole Kallestad: Misuse of Terrorism Prosecution & The International Community: The Implications of Human Rights & the Power of State Sovereignty
- OG2 Peter Schoening: Discrimination in the United States Political Asylum Process
- OG3 Karen Fierro: Should Female Genital Mutilation Be Classified as Torture
- OG4 Matthew Evans: A Legal Perspective on American Rights, Responsibilities, and Shortcomings with Man's Most Precious Resource: Water

- Oral J** **Room 123**
- OJ1 Sarah Sprouse: Curating Collective Memory: Awakening Nationalism Through Mexico's Museums
- OJ2 Anastasia Borseth: Jerry Uelsmann: A Study in Surrealist Art
- OJ3 Allison Adachi: The Differing Views of Eggleston's Work Over Time
- Oral M** **Room 124**
- OM1 William Stephan: Post-Death Rhetoric and America's Understanding of the Inescapable
- OM2 Elizabeth Jacobs: Exploring the Wall Between Bible and Baphomet: Media Coverage of Church-State Conflicts
- OM3 Abigail Sedra: Christianity in Politics: Using Religion to Advance American Exceptionalism in Trump's America
- Oral P** **Room 126**
- OP1 John Andrianu: The Role of the arrA Gene in the Dissimilarly Arsenic Reducing Bacteria, Shewanella Sp. Strain ANA-3, with Arsenate and Arsenite
- OP2 Hanna Clements: Development of Curcubit[8]juril as a Supramolecular Clip for Beta Hairpin Peptides
- Oral S** **Room 113**
- OS1 Kelsey Bajet, Teresa Jenson, & Joshua Jacobs: Cultural Variability in the Construal of Moral Violations: Americans React More Intensely to Rights Violations and Japanese React More Intensely to Duty Violations
- OS2 Teresa Derouin, Taylor Kirschenmann, James Vair: Cultural Variability in the Persistence of First Impressions: The Role of Relational Mobility
- OS3 Devin Ellis, Korrina Asmus-Sivongxay, Kenedy Ramos: The Psychological Foundations of American Exceptionalism in Climate Change Denial
- OS4 Clare Manthey, Jackie Armour, Carly Ball: Examining Sources of Person-Culture Mismatch: Can Marginalizing Situations Cause Behaviors to Deviate from Cultural Norms?
- Oral V** **Hogan**
- OV1 Tyler Stitt: The Mathematics of Twelve-Tone Music
- OV2 Steven Beres, Rachael Kuhn, Hayley Olson: Link Invariants on Klein Links
- OV3 Denin Koch: Learning to "Read" a Jazz Solo: Dissecting the Language of Pat Metheny
- OV4 Jacob Krantz, Maxwell Dulin: Probabilistic Syllabification of English Words
- 10:00 AM**
- Oral B** **Room 103**
- OB1 Cailtyn Heredia: Breaking Down the Athlete: Acting on Compassion
- OB2 Siena A. Morgan: Perceptions of International Anti-Doping Policy in Collegiate Coaches
- OB3 Jesse Croskrey: Career and Educational Experiences of High School Athletic Directors: A Multi-Level Perspective
- OB4 Brian Fowler: Prevalence of Problem Gambling Habits in Student-Athletes at Religious Institutions
- Oral E** **Room 104**
- OE1 Julie Henling: "I Know What Kind of Man You Are": Constructing Masculinity in Spenser's The Faerie Queene and Tennyson's Idylls of the King
- OE2 Madison Schreiter: The Shadow of Eve and How It Impacts Una in the Faerie Queene
- OE3 Teresa Yandl: Servicing Men: Feminine Sexuality in Spenser's The Faerie Queene
- Oral H:** **Room 111**
- OH1 Jacob Krantz, Maxwell Dulin: Machine Learning Accuracy in Automatic Part-Of-Speech Tagging
- OH2 Carter Timm: A Non-Uniform, Event-Driven Sampling Waveform Approximation Technique Applied to Context-Free Phone Classification for Automatic Speech Recognition
- OH3 Joshua Tuttle: Communication's Interpretive Algorithms and Re-Compilation Thresholds: Literature as Engagement Emulator
- OH4 Rianne Lyons: Fundamental Frequency Analysis with Speech Processing Tools for Large Corpora
- Oral K:** **Room 123**
- OK1 Joseph Kincaanon: Measuring Salary Inequality Among University Professors
- OK2 Shannon Liska: Our Future Fathers: Examining Seminarian Experience on College Campuses
- OK3 Callen Aten: Deeply Divided: Conservative Students on a Liberal Campus
- OK4 Kevin Dolan: Experiences in a Private University's Choir Group
- Oral N:** **Room 124**
- ON1 Allison Adachi: The Differing Views of Eggleston's Work Over Time
- ON2 Natalie Haskell: Entertainment News: How Comedy Influences National Politics
- ON3 Madison Burke, Skyler Noble, Rachel Rogers: The Effect of Extroversion Levels on Desired Affection

**Oral Q:** **Room 126**

- OQ1 Josiah VanWingerden, Matthew Spencer: Free Speech and Football: Colin Kaepernick and the Black Lives Matter Movement  
OQ2 Marissa Moffett: Connectedness: An Analysis of Power in Social Networks  
OQ3 Marilyn Melgoza, Caleb Dawson: Inclusion, Affirmation, and Equity in the Classroom

**Oral T:** **Room 113**

- OT1 Weston Staab: Optical Diagnostics of Simple Biogas Flames  
OT2 Charles Mielke: Estimation of Enthalpy of Desorption for a Metal Hydride Using Equilibrium Pressure Data Through a Small Temperature Range  
OT3 Taisiia Feoktistova: Phosphorus Sorption Maxima and Equilibrium Phosphorus Concentration for Sediments of the Little Spokane River  
OT4 James Finnegan, Phillip Geist: Corner Failure of Unreinforced Masonry Buildings

**Oral W:** **Hogan**

- OW1 Jennifer Douglas: Mental Illness in the Media  
OW2 Annica Balentine: "Treat with Reassurance": A Feminist Critique of the Discourse Regarding Contraception in OB/GYN Textbooks  
OW3 Anne Marie Noll: The Rise of Supermarkets in Chile and the Marginalization of the Mapuche People (1970's – 2000's)  
OW4 Callan Radnovich: Coping and Chemicals – Student Stress and the Phenomena of "Self Medication"

**11:00 AM**

**Oral C** **Room 103**

- OC1 Grace Nakahara: Biggest Fears, Smallest Screen Time – Women of Color in Horror Films  
OC2 Gabriel Rivas: A Little Bump and Grind: Sex and Sexuality in Horror Films  
OC3 Ali Rushevics: How Do We Know What We Know We Don't Want to Know?: Gadamerian Hermeneutics and the Horror Film  
OC4 Riana Slyter: Feeding the Monster of Our Imagination

**Oral F** **Room 104**

- OF1 Kendall Clark: Marvell the Heterosexual  
OF2 Vincent Andrew Lopez: The Phallogocentric Nature of the Renaissance  
OF3 Jessica Hoogerhyde: Gender and Spirituality in Health Care Chaplaincy

**Oral I** **Room 111**

- OI1 Abigail Nye: Is Hildegard of Bingen a Role Model for Women Today?  
OI2 Chawna Crawford: If at First You Don't Succeed: Grassroots Efforts to Solve the Problem of Homelessness  
OI3 Megan Napier, Aliyah Miller, Maddie Sessler, Jessica Cary, Emma Wolfram: Breathing Techniques Used to Conserve Air in a Self-Contained Breathing Apparatus

**Oral L** **Room 123**

- OL1 Christian Astran: How Does Digital Communication Affect Millennial Sexuality and Intimacy?  
OL2 Katie Wilcox, Amanda Lacayo: Romantic Attachment Styles and Relational Maximization  
OL3 Lauren Weiser: Global Norms Regarding Sexuality  
OL4 Kristin Bertsch: Female Sexuality in The Odyssey: The Penelopean Perspective on Fidelity

**Oral O** **Room 124**

- OO1 Kathryn Benson: Reforming Grace: How Sweet the Sound  
OO2 Judith Mata: History of Resistance to and Recognition of Reproductive Rights in the RCC: The Theology and Practice  
OO3 Madison Schreiter: From Cultural Outsider to Cultural Insider: How Movies Americanized Catholicism  
OO4 Claire Coughlin: White Jesus

**Oral R** **Room 126**

- OR1 Nodia Rogers: Hidden Truths: Public Art as a Means of Social Change within Urban Cities  
OR2 Corey Horn: Environmental Policy with Respect to the Future  
OR3 Blake Buchanan: Perceptions of Inclusion

**Oral U** **Room 113**

- OU1 Katherine Joyce: Foundations of Fear: Student Perceptions of Crime and Safety  
OU2 Jedidiah Keating: Japanese Americans and Mainline Christianity in Washington State During World War II  
OU3 Dallas Nelson: The Effectiveness of Visual Promotion Practices in Student On-Campus Advertising



## Poster Session 3, 10:15 AM – 12:00 PM

### 10:15 AM – 12:00 PM

Hallway

- S101 Phillip Bax: Wnt5a Induced Protein Depalmitoylation is Required for Cell Movement in Zebrafish
- S102 Benjamin Buchalski, Eric Gutierrez: Weapon Performance of Rhinoceros Beetles
- S103 Celeste Campos, Ciara Fletcher, Emily Walzer: Analysis on the Effects of Whole Bovine Milk Ingestion on Salivary Cortisol Concentration in College Students
- S104 Tamiya Tisdale: Quenching of the Cerium-Catalyzed Bromate-Ethylacetoacetate Oscillation Reaction
- S105 Alyson King: Phosphorous Sorption of Little Spokane River Sediments Under Aerobic and Anaerobic Conditions
- S106 Katie Bellefeuille: The Effects of Contingent Rewards on Decreasing Talk Outs for a Middle School Student with an Intellectual Disability in a Self-Contained Classroom
- S107 Katherine Sumantri: The Effects of a Direct Instruction Flashcard System on Sight Word Recognition for a 1st Grade Female Student with Developmental Delays
- S108 Ilynn An: The Effects of Direct Instruction Flashcards on Sight Word Recognition on an Eight-year-old Girl with a Developmental Delay
- S109 Evelyn Cooper: Temperature Loss Data for Two Metal Hydrides in Engineered Hydrogen Storage Containers: Prediction of Temperature Loss for Future Designs
- S110 Sarah Zeitler: The Effects of Oxidation States of Praziquanamine Derivatives on the Activity of Human Aryl Sulfatase B
- S111 Michaela Arnold: A critical discourse analysis of the LA Times article, "Sanctuary Cities: How Kathryn Steinle's death intensified the immigration debate."
- S112 Noelle Winter, Katherine Sumantri, Emily Mincin: The Effects of the Model, Lead, Test Procedure on Signing the Alphabet for Two 7th Graders with Down Syndrome
- S113 Aaron Sandoval: A Histologica Comparison of Ear Skin Regeneration in Acomys and Mus
- S114 Trent DeGiovanni: Most Economical Common Dissection of a Square and Equilateral Triangle
- S115 Nikki Olsen: Salt Quenching of an Oscillating Cerium-Catalyzed Bromate-Malonic Acid Reaction
- S116 Shelbie Blevins: A Critical Discourse of the Chilling Effect of Nuclear Weapons on International Relationships
- S117 Janine Warrington: Space to Wonder
- S118 Zachary Steinberg: Effect of Different Side Chains on the Zinc-Binding Properties of Lanthanide Complexes

Room 108

- S119 Justin O'Farrell: Identifying Sites of Courtship Pheromone Production in Plethodontid Salamanders
- S120 Jessica Bixby: Luminescence of Rhenium Tricarbonyl Complex containing a Dihydroxyphenanthroline Ligand
- S121 Heather Stanley, Jill Barta: The Use of Model Lead Test Retest on a Developmental Impairment Student to Increase Street Sign Recognition
- S122 Calle Sullivan, Katherine Ruff: The Effectiveness of Direct Instruction Semi-Concrete Counters on Adding Negative Integers for a High School Female in a Resource Room
- S123 Natalee Amaro, Jessica Johnson: The Effects of a Direct Instruction Flashcard System on High-Frequency Sight Word Recognition for a 10th grade male student
- S124 Zachary Gustlin: A fracture mechanics based approach to hydrogen fatigue
- S125 Joseph Jesse: Analysis of Helical Beams
- S126 Roberto C. Murillo: Activating Transcription Factor 5 (ATF5) Stimulates Autophagy in Various Mammalian Cancer Cells

Room 109

- S127 Mary Armstrong, Isabelle Caigoy: The Effects of a Direct Instruction Flashcard System on Sight Word Recognition with an 18-Year-Old Male with a Learning Disability in a Classroom Setting
- S128 Khawlah Alkushayban: The Use of Direct Instruction Flashcards with Model, Lead, and Test to Teach Sight Words to a Student with Intellectual Disability
- S129 Paul Bickel: Tensile Properties of Commercially Pure Titanium After Exposure to Gaseous Hydrogen
- S130 John Chatburn, Amy Hilland, Matt Lower, Martee Snyder, Tim Weber, Coral Wonderly: Vision for the Hangman Creek Watershed
- S131 Heather Ryan, Makenna Sellers, Tyler Kimbrell-Knutson: Measuring Beyond the Mainstream: Ecosystem Services and Economic Viability of the Spokane River
- S132 Allison Bigelow, Abby Tomlinson: Examining Differences in the Transition to College, First-Year Seminar Experiences, and Career Maturity Between Traditional, Transfer, and Dual Enrollment Students
- S133 Christine Drummond, Kelee Lambert: The Relationship Between Extracurricular Activities During Youth and Coping Strategies in Adulthood
- S134 Forest Dexter: Quenching the Oxidation of Pyrogallol by Bromate Using Various Salts

Room 122

- S135 Sarah Hill: Stabilizing PepX L. helveticus through the Introduction of Disulfide Bonds
- S136 Christina Winters: Analysis of GPS locations for elk based on radio collar data for two differing collar types
- S137 Kateryna Kostenkova: Synthesis, Purification and Characterization of fac-[Re(CO)<sub>3</sub>(Cl<sub>2</sub>phen)]<sup>+</sup> and fac-[Re(CO)<sub>3</sub>((NH<sub>3</sub>)<sub>2</sub>phen)]<sup>3+</sup> Complexes for Biological Imaging Applications
- S138 Kaitlyn Hahn: Quenching the Manganese Catalyzed Belousov-Zhabotinsky Reaction
- S139 Amy Hansen, Catherine Martin: The Effect of a Token Economy on Decreasing Talk outs for a Student
- S140 Teresa Jensen: The Effects of Model-Lead-Test with DI Flashcards on a 17-year-old boy with Intellectual Disabilities

- S141 Mariano Laguna, Angela Lanning, Kassandra Zohn, Nathan Foster: An Evaluation of Alternative Construction Techniques for Affordable Housing
- S142 Bryan Erich Yu: Effect of Gate Location on Injection Molded Acrylonitrile Butadiene Styrene (ABS) Tensile Bars
- S143 Cesar Ortiz Rios, Andrew D’Alba, Patrick Tjandra, Everett Fellger: Relaxation of Injection-Molded ABS
- S144 Anna Lague: Selfie-Image

**BEST POSTER AND BEST ORAL PRESENTATION AWARDS**

In your registration materials, you have received a ballot for voting on the best poster and best oral presentation at this year’s SIRC. Here’s how the voting process works – and your incentive for attending sessions and submitting a ballot:

- Attend poster and oral presentation sessions. Consider the presenters with whom you spoke, and decide who you felt did the best job. Some criteria you might consider include the intellectual or creative merit of the work, the clarity and organization of the presentation/poster, the quality of the delivery, and many others.
- Write the **abstract number**, which you can find in the program, of the presentations you think are the most deserving of awards on the appropriate line of your ballot form.
- Be sure to have your ballot verified by at least three faculty moderators (in the case of oral presentation sessions) or poster session hosts. By getting your ballot verified, you become eligible for a random drawing for a prize for attendance!
- **Turn in your ballot at the registration table in the Jepson lobby no later than noon on Saturday.** Results will be tabulated, announced and posted by 12:15 pm on Saturday. Winners who are not present will be notified of their win by e-mail. These individuals can contact CURCI at [curci@gonzaga.edu](mailto:curci@gonzaga.edu) to set up a time to pick up their prize.

Please attend as many sessions as you can. Support your friends and colleagues at their presentations, and stay to talk to other students at their posters and listen to the other presenters in a session. Ask questions, start a conversation, and enjoy your time here at SIRC 2017!

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Administrative support provided by:  
 Gonzaga University’s Center for Undergraduate Research and Creative Inquiry  
 Gonzaga University’s Department of Marketing and Communications



**SPOKANE INTERCOLLEGIATE RESEARCH CONFERENCE**  
**April 21, 2017-April 22, 2017 --- Gonzaga University**  
**SESSION SUMMARIES**

**Poster Session 1**

**F101 Evaluation of Lignocellulosic Biomass Combustion**

**Jack Gallagher**

Burning of wood and other products of a lignocellulosic composition has remained a primary source of fuel throughout the world. Wood fuel usage, especially in developing regions, has remained constant for the last forty years. This is concerning as some products of wood combustion can have detrimental effects on the environment. Some of these products, notably polyaromatic hydrocarbons (PAHs) and dioxins, are also carcinogens. This project seeks to limit production of carcinogenic dioxins and PAHs that result from incomplete wood combustion where previous studies have dealt primarily with the products of complete combustion (i.e. soot and ash). This project will also focus on the intermediate products that lead to dioxin and PAH formation that has often been overlooked in previous work. This project looks to use open flame combustion and realistic lignocellulosic combinations to achieve a more effective emulation of real world wood combustion conditions.

**F102 Development and analysis of a zinc-responsive lanthanide complex for early detection of prostate cancer via PARACEST MRI**

**Riley Meister**

Several studies have demonstrated that prior to the presentation of symptoms associated with prostatic malignancy, the peripheral tissue of the prostate exhibits a significant decrease in zinc concentration. The development of a non-invasive method capable of detecting this decrease in vivo could potentially facilitate early and accurate detection of prostate cancer. The aim of this project is to synthesize and characterize a zinc-responsive Magnetic Resonance Imaging (MRI) agent. The central hypothesis of this project is that the MRI properties of this contrast agent will be altered upon the binding of Zn<sup>2+</sup> ions, and this alteration will translate into an observable change in the magnitude of the MR signal. The proposed agent would comprise a lanthanide complex consisting of an octa-dentate ligand furnished with two zinc-binding groups, and the lanthanide europium. This compound will be synthesized through a 6-step synthetic method, and characterized using modern analytical techniques. To date, 4 of the 6 synthetic steps have been successfully completed and these intermediate compounds have been characterized using <sup>1</sup>H and <sup>13</sup>C-NMR spectroscopy. Future work will include completion of the synthesis, investigation of the stability and zinc-responsive properties of the final compound.

**F103 Radical SAM Enzymes Involved in Compatible Solute Biosynthesis**

**Sarah Byquist**

Compatible solutes are essential for maintaining osmotic balance within cells allowing them to survive in high salinity conditions. N<sup>ε</sup>-acetyl-<sup>β</sup>-lysine is a compatible solute unique to methanogenic archaea, which are known to be able to survive in extremely harsh conditions, including exceedingly salty environments. The genes involved in the production of this solute in the methanogen *Methanococcus marisaludis* S2 are MMP0861 and MMP0862. MMP0861 encodes the radical S-adenosyl-L-methionine (SAM) enzyme, lysine-2,3-aminomutase (KAM), which converts <sup>β</sup>-lysine to <sup>ε</sup>-lysine, and MMP0862 encodes an acetyl transferase that subsequently acetylates the beta-lysine. The functions of these genes were determined based on knockout studies, however, the in vitro enzymatic activity of the encoded proteins has not yet been demonstrated. Another strain of *M. marisaludis*, denoted C7, contains two previously uncharacterized genes that have homology to the well-characterized KAM from *Clostridium subterminale*. Based on sequence, it is hypothesized that MmarC7\_0106 is the  $\alpha$ -real KAM involved in N<sup>ε</sup>-acetyl-<sup>β</sup>-lysine biosynthesis and that MmarC7\_1783 may be involved in another compatible solute's biosynthesis. This study investigates the role and functions of MmarC7\_0106 and MmarC7\_1783 based on a comparison to the in vitro functionality of the *Clostridium* KAM.

**F104 Investigation of a novel route for para-amino benzoic acid biosynthesis in Chlamydia**

**Kevin Brandecker**

*Chlamydia trachomatis*, is a bacterium that is the most prevalent sexually transmitted infection in the United States and is also responsible for causing trachoma, the leading cause of preventable blindness in the world. *C. trachomatis* is missing three genes in the canonical biosynthetic pathway for para-amino benzoic acid (pABA), a folate precursor to folate. One gene from *C. trachomatis*, CT610, was previously identified to rescue an *E. coli* pABA-auxotroph. We are investigating the substrate and mechanism involved in the CT610-catalyzed reaction through both in vivo and in vitro approaches. Using mutant *E. coli* strains complemented with CT610, we plan to test if CT610 is able to restore pABA production in order to determine potential CT610 substrate(s). Additionally, CT610 has been cloned into a vector that allows for heterologous overexpression of the protein in *E. coli*. With various proposed substrates/cofactors in order to demonstrate that CT610 catalyzes the synthesis of pABA.

**F105 Towards Supramolecular Catalysis via Cucurbit[8]uril Host and a Transition Metal Cofactor**

**Curt Wong**

This project aims to develop a self-assembled supramolecular catalyst utilizing the host molecule Cucurbit[8]uril (CB[8]) and a transition metal cofactor in the hydroxylation of a benzylic carbon. Although host molecules have been previously used in the development of supramolecular catalysts, there are challenges associated with their time-consuming synthesis. Cucurbit[n]urils have been gaining popularity

as an effective host due to characteristics like excellent substrate recognition abilities and high affinity binding with organic molecules and cations. It has been shown that CB[8] can encapsulate molecules through hydrophobic interactions within its cavity and electrostatic interactions with cations at its two rims, which are highly populated with carbonyl groups. Furthermore, CB[8] has been shown to catalyze the rate and selectivity in proof-of-concept reactions, such as Lewis acid catalyzed Diels-Alder reactions. However, supramolecular catalytic systems that involves CB[8] are rare. This project is specifically aimed at utilizing Cu<sup>2+</sup>, Mn<sup>4+</sup>, or Zn<sup>2+</sup> coordinated ligands to react with a substrate molecule. The encapsulation of the metal ligand cofactor and substrate by CB[8] is anticipated to promote catalysis due to spatial restriction between a cofactor and substrate molecule.

F106 Exploring the Effects of Suicide Inhibition on Burkholderia cenocepacia HMG-CoA Reductase

**Alexandra Cumings**

Isoprenoids are key molecules that play active roles in organisms from all kingdoms of life. These molecules include cholesterol, signal transduction and electron transport chain constituents, plant and other steroid hormones, and many more. Considering that these biomolecules are important in various physiological processes, the regulatory properties that constitute their production are widely investigated. The main site of regulation in isoprenoid biosynthesis is the reversible conversion of HMG-CoA to mevalonate by 3-hydroxy-3-methylglutaryl-CoA (HMG-CoA) reductase. This enzyme catalyzes this first committed step in the mevalonate pathway, making it a primary drug target. The opportunistic lung pathogen Burkholderia cenocepacia codes for HMG-CoA reductase, which is utilized by the organism in a unknown fashion. B. cenocepacia causes often-fatal infections in patients with cystic fibrosis due to its natural antibiotic resistance. It is been hypothesized that mevaldehyde, the second intermediate in the HMG-CoA reductase reaction, could act as a suicide inhibitor by forcing the enzyme into a particular quaternary state by covalent modification. Alteration of the active site by the irreversible enzyme-inhibitor complex would induce suicide inhibition and inactivate the enzyme. This could potentially provide means for controlling the organism overall. The attempt to synthesize mevaldehyde is still in process. B. cenocepacia HMG-CoA reductase will be expressed and purified. Inhibition will be tested using enzyme kinetics and quantified by measuring the rate of production of NADH.

F107 Development of Dual-Modality Lanthanide Complexes for Biomedical Imaging Applications

**Diana Karlova**

Magnetic resonance imaging (MRI) is a biomedical imaging technique that produces high-resolution images of soft tissue within the body. These MR images can be further enhanced with the use of a contrast agent allowing for a more in-depth diagnosis of a patient. There are three main classes of contrast agents; T1, T2 and PARACEST agents, all of which enhance MR images through different mechanisms. While the majority of contrast agents used clinically are gadolinium-based T1 agents, lanthanide complexes that induce contrast through the PARACEST MRI mechanism are becoming more attractive for molecular imaging applications. Our particular interest in lanthanides is due to their unique paramagnetic and optical properties resulting from their partially filled f-orbitals. The goal of this project is to take advantage of both these optical and paramagnetic properties by synthesizing and investigating the MRI and optical properties of two dual modality lanthanide complexes. The proposed complexes consist of a cyclen ring with three side arms and an appended antenna that cooperatively stabilize the coordinated Eu<sup>3+</sup> ion. The purpose of the antenna is to sensitize the luminescence of the Eu<sup>3+</sup> ion, while the water molecule coordinated to the Eu<sup>3+</sup> ion should result in the MRI properties of the lanthanide complex. To date, both Eu<sup>3+</sup> complexes have been successfully synthesized and characterized using <sup>1</sup>H and <sup>13</sup>C NMR Spectroscopy. Future work will include investigating and comparing the magnetic and luminescence properties of both complexes.

F108 Computational Analysis of Cellulose Combustion

**Alyssa Arellano**

Lignocellulosic biomass has been identified as a potential resource for renewable energy and fuel alternative. The increasing need for a viable alternate fuel source creates a need to uncover the intricacies of the cellulose combustion mechanism. Variations in biomass composition make the exact structure difficult to analyze requiring simplification. The formation of polyaromatic hydrocarbons (PAHs) and dioxins during combustion is known but the mechanism through which they are produced is not well known. To approach the PAH and dioxin formation in cellulose combustion, a computational approach is underway. Glucose and its dimer, which are main components found in biomass, are viable options for computational modeling. Consequently, a glucose dimer was repeatedly broken via alpha radical cleavages. These radicals will propagate the production of small fragments, which can recombine to form PAH and dioxins. More specifically, these fragments were optimized and analyzed via Gaussian, a quantum chemical program. The results will determine which structures might exist and potentially recombine to form PAHs and dioxins.

F109 Development of Nanodisc Modified Stationary Phases for Bioaffinity Chromatography

**Benedict Beam**

Ion binding at biological membranes generally have a weak interaction and yet carries significant biological importance. Because of the low affinity, the interaction is difficult to study. Chromatography is adept at analyzing weak interactions between substances and stationary phases, but there are challenges to designing an analytical system that can mimic biological membranes and withstand the high pressure of liquid chromatography. This research focuses on the isolation, purification, and analysis of a membrane scaffold protein (MSP), which is necessary for the assembly of lipid Nanodiscs, a novel technology involving small solubilized membrane fragments. The larger purpose of the work is to examine Nanodiscs as membrane stationary phases by attaching them to modified silica particles through a histidine tag on the MSP. We hypothesize that such a system will reduce silica-membrane interactions and ultimately allow ion binding to be measured chromatographically with more complex membrane proteins. To date, modifications surrounding growth media and growth conditions have resulted in successful isolation and purification of MSP. This data and preliminary results involving Nanodisc assembly will be presented.

F110 Determining the Activation of the Bacillus subtilis Stressosome by RsbRA Protein Phosphorylation Levels under Stress

**Karina Lopez-Damian**

Bacteria have effective pathways to respond to their dynamic environment, specifically fluctuations in temperature, pH, acidity, salinity, and oxidative stress. The general stress response system in Gram-positive bacteria, such as *Bacillus subtilis* and *Listeria monocytogenes* are regulated by  $\sigma^B$ , an alternative sigma factor. In *B. subtilis*,  $\sigma^B$  controls the transcription of genes required to neutralize the stress encountered in the microorganism's environment, however, the activity of  $\sigma^B$  is controlled by a signal transduction pathway that begins with the stressosome. The *B. subtilis* stressosome is a large protein complex, 1.8MDa, composed of the kinase RsbT, and sensors RsbS, and four RsbR proteins, which coordinate the environmental stress response to activate the  $\sigma^B$  cascade. When the stressosome senses an environmental stress the kinase RsbT phosphorylates RsbRA at T171 and T205 in order to be released from the complex, thus initiating the environmental stress response. Past research established that the stressosome detects environmental stress, however, it remains unknown whether reactive oxygen species(R.O.S.) are sensed through the stressosome. Exposure to R.O.S, which can be made as a byproduct of metabolism, has the potential to cause protein damage, mutagenesis and even cell death. Therefore, I will be detecting the activation of the *B. subtilis* stressosome in vivo under oxidative stress. The phosphorylation levels of RsbRA will be monitored using a Myc tagged version of the protein. This will allow me to visualize the activation of the stressosome protein RsbRA through western blotting and determine if R.O.S are sensed through the stressosome in addition environmental stress.

F111 Using Computational Methods to Model Burkholderia Cenocepacia' s Moriphein Protein, HMG-Coa Reductase

**Jean-Claude Abboud**

*Burkholderia Cenocepacia* (BC) is a human lung pathogen that usually infects patients with compromised immune systems and is usually fatal. To combat this pathogen, the metabolic pathway of the bacteria is being targeted, to hopefully create a novel cure. More specifically the HMG-CoA Reductase(HMGR) is being targeted because of its role in using mevalonate to create HMG-CoA. This protein has been very difficult to elucidate the structure due in part to its morphein nature, which means that the protein can adopt multiple oligomeric states when different substrates are bound. Computational modeling of the BC's HMGR can be used to create predictions of these oligomeric structures. Computer modeling is an effective tool that can be used to perform very expensive reactions effectively, generating theoretical models of proteins and reactions without having to perform them in the lab. The oligomeric bound structure is the only state that has been determined so far using x-ray crystallography, which is the basis for creating these new predicted structures. Using visualization software PyMol, Virtual Molecular Dynamics, and Scalable Molecular Dynamics, HMGR can be simulated with different substrates bound to it creating computational models of different oligomeric states. These different computational models will be compared at the proteins dimer interface to better understand the molecular interactions going on between the residues there. The models will then be tested against the protein's physical characteristics such as kinetics. Computational modeling can be an effective tool for determining states of proteins that cannot be directly captured with crystallography.

F112 The Reductive Formation of a Key Dialdehyde in a Fluor Lactate Synthesis Pathway

**Christopher B. Usi**

A valuable tool in organic synthesis is being able to obtain aldehydes directly from carboxylic acids without having to completely reduce them to an alcohol and oxidize back up to the aldehyde. We are exploring the direct reduction of fumaric acid to the dialdehyde using 9-borabicyclo[3.3.1]nonane (9-BBN) and lithium tris(diethylamino)aluminum hydride (LTDEA). Within this reduction step, 9-BBN is the major component that allows for specificity and it ensures that the carboxylic acid is not completely reduced. In order to isolate these products, a sodium bisulfite adduct will be made in order to stabilize the resulting dialdehyde. This reduction then provides a key reagent for the synthesis of fluorolactate analogs which is the overarching goal of this project.

F113 New Ideas in Oxidative Side-Chain Coupling

**Ryan Francis**

Glycopeptide antibiotics, such as vancomycin and teicoplanin, make up a significant portion of what are considered to be drugs of last resort. Industrial syntheses of these drugs have historically been elusive due to a number of selective reaction steps which are carried out through enzymatic activity in nature. The problem of biomimetic catalysis is one of the greatest barricades to synthetic production and modification of these drugs. In particular, oxidative side-chain coupling, the final step of the vancomycin biosynthetic pathway, joins the R-groups of two tyrosine derivatives on the glycopeptide chain. In vivo, this process is highly selective by necessity as all other modifications to the peptide must remain intact during the oxidation. This reaction is most often mimicked using metal oxidizing agents, many of which are quite harsh and require cumbersome additional directing groups for selectivity. It is a possibility that hypervalent iodine compounds, such as diacetoxy iodobenzene, may provide more mild reaction conditions while maintaining selectivity. In addition, the use of cucurbit[8]uril is being investigated as a means for aqueous catalysis of tyrosine oxidation. To test these hypotheses, several tripeptides of the form Tyr\*-Leu-Tyr, with \* representing modified tyrosine, were synthesized and exposed to oxidants under varying conditions. Preliminary screening of tripeptide with diacetoxy iodobenzene in trifluoro ethanol shows the formation of a product which can be isolated with relative ease on a silica column. In addition, a reaction intermediate hypothesized to be a radical cation was observed during the oxidation process, providing a potential foothold for control of product formation.

F114 Identification of proteins associated with RquA in the biosynthesis of rhodoquinone

**Annie Gibson**

Parasitic helminths are able to live within their host by respiring anaerobically through the fumarate reduction pathway. This pathway relies on the molecule rhodoquinone (RQ), which is an aminoquinone similar in structure to ubiquinone (Q), a quinone utilized in the electron transport chain in aerobic respiration. An essential protein for RQ biosynthesis is RquA, which is predicted to be a transmembrane SAM-dependent methyltransferase, and a novel means to target parasites within the host. The biosynthetic pathway of RQ is yet to be elucidated, but it is predicted to be similar to the pathway. Q is synthesized via a transmembrane Q biosynthetic complex. The presence of a RQ biosynthetic complex was investigated using pulldown experiments with solubilized membranes from the native *Rhodospirillum rubrum*, and RquA, which was immobilized on nickel-affinity beads. Proteins associated with RquA will be individually sequenced and characterized to determine a novel method to target RQ biosynthesis.

F115 Investigating an Acyl Anion Equivalent via the Deprotonation and Nucleophilic Activity of 4-phenyl-2,6,7-trioxabicyclo[2.2.2]octane

**Cooper Vincent**

4-phenyl-2,6,7-trioxabicyclo[2.2.2]octane is a novel compound that is unique because it possesses a protected carboxylic acid carbon. This molecule has the potential to reverse the electrophilicity of a carbonyl carbon via deprotonation of its protected counterpart. A reliable synthesis for 4-phenyl-2,6,7-trioxabicyclo[2.2.2]octane has been developed and the deprotonation of this molecule is being explored. Nucleophilic attack will be assessed by reaction of the anion with anisaldehyde. Currently, this project is in the stages of attempting to deprotonate 4-phenyl-2,6,7-trioxabicyclo[2.2.2] without the degradation of the anion. A Schlosser base, *n*-butyl lithium and *tert*-butoxide, is used as a base at a range of temperatures and a variety of times in order to optimize the conditions where the anion forms and can be maintained for reaction.

## Poster Session 2

F201 Identifying Areas of Courtship Pheromone Production in *Desmognathus ocoee*

**Darby McMillan**

Not much is known about how salamanders communicate. Our broad objective is to use histological methods to characterize novel areas of pheromone production in plethodontid salamanders (lungless salamanders) focusing on *Desmognathus ocoee*. The submandibular mental gland, which is observed in male plethodontid salamanders, is known to secrete courtship pheromones, and we hypothesize that there are glands in other regions that also produce pheromones. During courtship, plethodontid salamanders perform a coordinated tail-straddling walk, in which the female rests her chin on the male's dorsal tail and walks along behind him. The tail-straddling walk may last over an hour, and during that time the male plethodontid must keep the female interested in courtship. It is likely that courting salamanders maintain communication through pheromones produced on the male's dorsal tail where the female rests her chin. Preliminary evidence using immunohistochemistry has shown positive staining for courtship pheromones in dorsal tail granular glands of *D. ocoee* males.

F202 Do Precipitation and Temperature affect the Habitat Usage of Brooding Sage-Grouse?

**Linnea Howard, Emily Korf**

The Greater Sage-Grouse (*Centrocercus urophasianus*) is a species of bird endangered in Washington State. Forbs, or herbaceous plants, are important during the grouse's brooding period (May through August), as they are a large part of the hen and chick's diet. Thus, it is possible temperature and precipitation can have an effect on the movement of brooding sage-grouse, as forbs may desiccate during the brooding period, forcing hens to move closer to mesic areas. Total rainfall, average high temperatures, and brooding hen locations over the course of 6 consecutive brooding periods were analyzed in order to find a relationship between weather factors and hen behavior. Our data indicate that there is not a statistically significant relationship between either total precipitation over the brooding period and hen distance to mesic areas, or average high temperature over the same time period and hen distance to mesic areas. Future research on other factors such as predator behavior and vegetation may further improve the current understanding of sage grouse behavior in relation to mesic areas, thus allowing for more effective conservation strategies.

F203 Investigation of Solvent Vapor Exposure on the Viscoelastic Properties of Injection Molded Acrylonitrile Butadiene Styrene (ABS)

**Jesslyn Bierman**

Tensile test specimens of ABS were injected at Rieff Injection Molding (Spokane WA) and subjected to a range of solvent vapor exposure conditions. These conditions varied from a couple days to weeks. The specimens were placed in an aluminum fixture inside a beaker partially filled with reagent grade ethanol. The specimens were not immersed in ethanol but were in constant exposure to the vapor for the various periods of time. The specimens were tested in tension at displacement rates of .016 in/min and .00001 m/min, and subjected to relaxation testing. The relaxation modulus was calculated at 1 minute and 10 minutes relaxation times. The data appears to show that there is a detectable difference on mechanical properties from ethanol vapor exposure for the samples tested. Specimens that were exposed to greater amount of time could withstand a greater amount of time in the tensile testing machine. They could withstand 1-2 more relaxation cycles than those that had no or very little vapor exposure. Since there is notable evidence that vapor exposure does affect the properties, the research is currently focused on obtaining the cut off time for vapor exposure to affect the properties. There is a time where vapor exposure begins to affect the properties, and then a time where it stops affecting these properties. This research is significant for engineering in the biomedical field. In this field, plastics are exposed to alcohol. This research can be important to those that may be getting a plastic body part.

- F204 **Hemodynamic Response to Blood Flow Restriction During Exercise Using Thigh Blood Pressure Cuffs**  
**Derrick Cordice, Kellie Waszak, Elena Smith, Morgan DeRuyter**  
 Current theory regarding changes in mean arterial pressure (MAP) during exercise involve the regulation of MAP through the "resetting" of aortic and carotid baroreceptors to higher "set-points." We proposed that MAP is controlled during exercise, and that the matching of blood flow (BF) demands and supplies is the regulated variable. PURPOSE: The purpose of this study was to examine BF rather than MAP as the primary regulated variable during exercise. METHODS: Fourteen (7 male and 7 female) physically active, college-aged subjects participated in this study with two factors of thigh compression: increased compression (IC) and no compression (NC), and two factors of BF demand: low demand (REST) and high demand (cycle ergometer exercise at 100 W (EX)). Subjects' stroke volume (SV), cardiac output (CO) and heart rate (HR) were continuously monitored. MAP and oxygen saturation (O<sub>2</sub> sSat) levels were measured during minutes 6, 8, and 10 of each resistance condition. Data was analyzed using a 2x2 repeated measures ANOVA (alpha = 0.05). RESULTS: There was a significant increase in MAP from the NC to IC condition during EX (104.0  $\hat{\pm}$  11.4 vs 113.1  $\hat{\pm}$  6.1 mmHg, p= 0.018), but not REST. There were no significant differences in CO, HR, SV, or O<sub>2</sub> SAT between the NC and IC conditions in either REST or EX. CONCLUSION: Supply and demand of BF is regulated when there is high BF demand (exercise), but MAP is regulated during low aerobic conditions (rest) when there is less demand for BF.
- F205 **Stupid F\*cking Bird**  
**Olivia Zertuche**  
 My poster will show the process of designing the stage concept for the second stage production: Stupid F\*cking Bird. The process will show everything from inspiration pictures, color schemes, preliminary sketches of each act, the final design concepts and lastly, pictures of the final product.
- F206 **Education and the Spokane River Project**  
**Riley Schumm**  
 In the footsteps of previous ENVS 499 classes, our group will be looking to use community outreach and education in the Logan neighborhood to teach about the Spokane River, in order to understand community needs and interaction with the river--specifically around the Mission Park area. Past research has shown that the community would like safer and more accessible river access, as well as more interactive education opportunities for youth in the Logan. Through our time spent at St. Als elementary school doing environmental education about the river and engaging students within this community project, students and teachers helped us to create a better understanding of what the community needs, and a proposal for Mission Park that allows for more river education and safer river access.
- F207 **The Effects of a Barrier and Maximal Jump Height on Basketball Shot Mechanics in Males**  
**Bennet Minnie**  
 PURPOSE: The objective was to observe the effect of a simulated defender, in the form of a barrier, on the basketball shot mechanics during a maximal jump free throw shot. METHODS: Experienced male right-hand dominant basketball players (n=11), ages 21-23, who played basketball competitively in high-school or college were recruited. Testing consisted of three conditions; the control condition was a free-throw shot without jumping (FTNJ), the second condition was a max jump free throw shot without the presence of a barrier (NBMJ), and the third condition was a max jump free throw shot with a barrier obstructing the subjects vision (BMJ). The barrier was adjusted such that subjects would be unable to see the hoop while standing, but during a max jump they would be able to see the hoop. Each subject shot until they completed six made shots from the free throw line for each condition (4.57 meters from the hoop). RESULTS: There was a significant negative correlation in the BMJ condition between elbow flexion (deg.) and ball angle (deg.) (r = -0.631), p < .05, elbow range ( $\hat{\Delta}^{\circ}$ ) (the difference between flexion and extension) and ball angle (deg.) (r = -0.781), p < .05, and elbow range (deg.) and mean change in max hip height (%) (r = 0.756), p < 0.05. CONCLUSION: The reported correlations indicate that shot mechanics are related to the jump height. Thus it may be beneficial for players to practice shooting at different jump heights to become accustomed to various shot mechanics.
- F208 **The Effects of Branch Chain Amino Acids in Delaying Central Fatigue**  
**Nicolas Quiroga**  
 Branched Chain Amino Acids (BCAA) have been theorized to delay the onset of fatigue. With low BCAA concentrations, precursors for serotonin, a motor neuron depressor, cross the blood-brain barrier more easily. By ingesting BCAA's, the ratio of Serotonin precursors to the BCAAs is reduced. The aim of this study was to observe the effects BCAA's have on central fatigue when in a glycogen reduced state.
- F209 **Electromyographic Analysis of the VMO/VL Ration on Stable vs. Unstable Surfaces**  
**Elena Smith**  
 Patellofemoral pain syndrome (PFPS) is associated with anterior knee pain and patella mal-tracking. A number of studies suggest that one cause of patella mal-tracking is low vastus medialis obliquus (VMO) activation relative to the vastus lateralis (VL) activation (VMO/VL). Most research points towards different quad strengthening exercises to increase the VMO/VL activation ratio, but the best exercises to do this remain controversial. PURPOSE: The purpose of the present study is to compare unilateral and bilateral squats on stable and unstable surfaces to determine which results in the highest VMO/VL muscle activation. METHODS: Electromyography (EMG) electrodes were placed on the muscle bellies of the VMO and VL. The subjects performed three trials of double leg and single leg squats on two different surfaces: the stable ground and a Bosu ball. The order of these trials were randomized for each subject. All EMG data was normalized using the EMG values from the double leg squat. A two-way within subject's ANOVA was conducted that examined the effect of surface type and the number of legs on the VMO, VL, and VMO/VL activation during a squat.



F210 Weight Response in Sprague-Dawley Rats Under the Introduction of Diet Coke® Containing Aspartame and Regular Coca-Cola Containing High-Fructose Corn Syrup

**Cassidy Johnston, Dakota Klamovich**

There has been varying research done on the effects of aspartame and high-fructose corn syrup on weight gain. Both sugar substances have different pathways that can lead to increased fat reserves in the body. Using female Sprague-Dawley rats, aspartame and high-fructose corn syrup were administered by ingestion of Diet Coke and regular Coca-Cola. Research was conducted based on the hypothesis that regular Coca-Cola, containing high-fructose corn syrup, would lead to a greater weight gain in the rats than that of Diet Coke due to the added calories consumed from the regular soda. In a 6-week study, 5 rats had 24-hour access to Diet Coke and 5 had 24-hour access to regular Coca-Cola. All rats also had access to an unlimited food and water supply and intakes of soda and food were recorded daily. Rats were weighed weekly to track cumulative weight gain. Diet Coke rats ate significantly more food than regular Coca-Cola rats but consumed a significantly smaller amount of soda. Regular Coca-Cola rats gained more weight than Diet Coke rats. An independent samples t-test showed that the difference in weight gain between the rats drinking regular Coca-Cola ( $n=4$ ,  $M=7.50$ ,  $SD=6.22$ ) and the rats drinking Diet Coke ( $n=4$ ,  $M=-2.25$ ,  $SD=5.17$ ) were statistically significant with  $p<0.1$ .

F211 Alcohol Use in Adolescents and Young Adults with First-Episode Psychosis

**Madison Kincaid**

Introduction: Approximately 100,000 adolescents and young adults experience first-episode psychosis (FEP) each year in the United States. Individuals with FEP are twice as likely as the general population to be diagnosed with co-occurring substance use disorders (i.e. alcohol use disorders (AUD)). The primary aim of this secondary data analysis was to describe alcohol use among adolescents and young adults experiencing FEP and examine the relationship between AUD and psychiatric symptoms prior to treatment. ; Methods: Secondary data analysis was conducted on 355 participants between the ages of 15-29 from the nationwide Recovery After an Initial Schizophrenia Episode-Early Treatment Program initiative. Descriptive analyses were performed and a multivariate analysis of variance (MANOVA) was conducted to assess the differences in psychiatric symptoms before treatment.

F212 Gratitude and Our Planet: Changing Behaviors

**Sophia Oswald**

We examined the relationship between gratitude for nature and willingness to volunteer time to help the environment. Many people will agree that our world is in a state of climate change, however, getting people to act on this knowledge has proven to be a difficult endeavor. Previous studies have shown that gratitude, the emotion felt when someone has done something positive for one-self, is linked to many benefits including increasing communal strength of relationships and willingness to help others. We hypothesized that gratitude can be used to boost communal strength with the environment, just as it does with human relationships and, consequently, lead to greater willingness to help. In the study, participants in the experimental group were asked to write about the last time they were grateful for their time outdoors, while participants in the control study were asked to describe a yard. Following the writing prompt, all participants answered several emotion questions, completed a measure of communal strength, and indicated their willingness to help with sustainability events on campus. We found that those in the gratitude condition felt significantly more grateful for nature and because of this were more likely to volunteer their time. These results have implications in developing new techniques to promote sustainability and care of the environment.

F213 The Christian Identity Movement: Theological Bigotry and Hate

**Emily Schneider**

Christian Identity's ideology is Counter-Christian, promotes hate and racism throughout much of the United States and needs to be combatted with legitimate theology and education. They pervert the language of the Bible to create new interpretations that do not have support in the text or logic. Legitimate readings of the Bible show that the Christian Identity Movement and earlier followers of similar beliefs do not have biblical or other valid support for their hateful theories. The roots of Christian Identity go back hundreds of years, and current followers are not just isolated extremists, but rather a large group of people who threaten our country and our people. It is essential that we show the falseness of their beliefs and the lack of scriptural support and educate people about the dangers they pose.

F214 From parents to current partners: How college students understand romance, intimacy and family.

**Lauren Wright**

College is a time of transition; many students begin to separate their views from their parent's views. The newness of independence perpetuates the hookup culture that is very common on college campuses. On the same hand, many students are beginning to seek a long-term partner. Several scholars have identified a correlation between children's parent's relationships and their personal short-term and long-term goals for an intimate partner. I have conducted 12 in-depth interviews on college students who have lived with their parents within the last four years to further understand how a child's perspective on their parent's relationship affects their personal views of intimacy. The research questions I am proposing are; Do parent's relationship have a long-term influence on young adults? How do children perceive their parent's relationship? What expectations do college students have for intimacy based on their family life growing up? These questions are broken down into five core topics throughout the interview; family life growing up, past relationships, present relationships, future relationships, and parent's relationship.

- F215 **Empathy and Brutality in "The Pillowman"**  
**Talena Kelln**  
 A reflection on the process of developing a one night staged reading of "The Pillowman" by Martin McDonagh in the Magnuson Theater on March 25, 2017. For the production I will specifically serve as director and leading actor (in the role of Katurian, a traditionally male role), as well as facilitate an audience talk back with Gonzaga faculty concerning the issues of police brutality in the context of empathy.
- F216 **Investigating the Role of the Uncharacterized Yeast Mitochondrial Protein Ylr283w in Proline Metabolism**  
**Steven Anderson**  
 The process of mitochondrial respiratory chain (MRC) biogenesis is not well understood and many of the factors required for its formation are still unknown. Currently, there are approximately 50 uncharacterized mitochondrial proteins that are conserved between humans and yeast, a subset of which are likely to play a role in MRC biogenesis. Fmp32 (Found in Mitochondrial Proteome 32) is one such protein that was recently implicated in MRC biogenesis and proline metabolism. Using bioinformatics, we found that another uncharacterized mitochondrial protein Ylr283w has high sequence homology to Fmp32. This led us to hypothesize that both these proteins may act together to form a proline transporter in the mitochondrial inner membrane. To test our hypothesis, a genetic knockout of YLR283w was constructed (ylr283w<sup>Δ</sup>) and its role in MRC biogenesis, as well as in amino acid utilization was investigated. By studying the growth of ylr283w<sup>Δ</sup> yeast on fermentable and non-fermentable media, we showed that YLR283w is not required for MRC function. To investigate its role in amino acid utilization, we studied growth of ylr283w<sup>Δ</sup> yeast on media containing various amino acids as the sole nitrogen source and found that ylr283w<sup>Δ</sup> shows a specific growth defect in media with proline as the sole nitrogen source. These results support our hypothesis that Ylr283w, along with Fmp32, is required for efficient utilization of proline by yeast.
- F217 **Effect of Music Therapy on the Acute Stress Response of College Students**  
**Elijah Varner, Riley Loudenback**  
 Music therapy, or the use of music to effect stability in a patient, is a growing method of therapeutic treatment for many physical and psychological problems. The benefits of music therapy to human physiology were documented first in the middle of the 20th century. Stress is a common and frequent response of individuals, especially university students. This research examined the effect of music therapy treatment on the acute stress response of college students. Using the Maastricht Acute Stress Test, a stress response was induced in participants with members being of either a control group (where no music was played) or of an experimental, music therapy treatment group (in which music was played throughout the trial). Stress response indicators, namely heart rate, systolic blood pressure, and diastolic blood pressure were measured. While participants in the music therapy group exhibited lower percent and quantitative increases in indicators, there was no statistically significant difference in either the quantitative increase or percent increase of any indicator between the control and music therapy groups. More research is necessary to conclude whether music therapy exhibits a positive effect on the human stress response.
- F218 **Seasonal vegetative variations in greater sage-grouse habitat in Lincoln County, WA, Lake County, OR**  
**Emily Walzer**  
 In response to local extirpation in Lincoln County Washington, greater sage-grouse (*Centrocercus urophasianus*) were reintroduced to the area using translocated birds from Hart Mountain National Antelope Refuge (HMNAR). In order to adequately manage the newly translocated birds it is important to understand their response to differences in climate between the source site and the destination habitat. This research compares various seasonal vegetative parameters of greater sage-grouse habitat at the Swanson Lakes Wildlife Area in Lincoln County, Washington, and at Hart Mountain National Antelope Refuge in Lake County, Oregon. Based on differences in seasonal brood movements, the hypothesis was that the growing season at the Swanson Lakes habitat would last longer into the summer than the growing season at Hart Mountain. Habitat areas were defined using triangulated brood hen locations. MODIS-based satellite image vegetation index data of the two regions spanning 16 years were analyzed using TIMESAT software, comparing season start time, end time, season length, peak value, peak time, and amplitude. Average season start time, end time, and length were not significantly different for the two habitats ( $\alpha = 0.05$ ). Peak value, peak time, and amplitude were significantly different, with Swanson Lakes exhibiting the higher peak value, earlier peak time, and greater amplitude ( $\alpha = 0.05$ ). This indicates that while timing is similar between the two sites, Swanson Lakes sites appear to have more vegetation overall, which may result in the observed differences in behavior.
- F219 **The Contradictions in Alcohol Education and How They Affect Young Adults in America Today**  
**Anna Astrom**  
 Being a college student and a woman in a population that is so heavily invested in drinking has lead me to reflect upon the messages surrounding drinking and how they are presented in American college culture. Although alcohol use is very high among college students, even those who are under the legal drinking age of 21, many recent studies fail to identify a universally effective method of lowering alcohol use and/or abuse. Several factors have been identified to increase alcohol consumption, one of the most interesting being alcohol education on college campuses. Students who are required to participate in alcohol education classes usually do not take the information seriously because the information is perceived as offensive to their intelligence and these educational courses may lead students to drink more. Shaming tactics have also been implemented in an effort to reduce alcohol use in college students, but these shaming tactics have also been observed having a positive correlation with more drinking behavior. Studies show that there are huge differences in the ways that drinking is perceived in females than in males. As shown through quantitative studies that explore social effects on drinking habits, media framing can influence drinking behavior and beliefs about drinking norms. In conclusion, messages about alcohol in modern society range from very negative to overly positive. I am hoping to expose the societal expectations about drinking and uncover a more practical and realistic approach to understanding drinking education and drinking habits.

- F220 **Removal of Periodic Noise and Motion Blur from Digital Images in MATLAB Using the Fourier Transform**  
**Dominic Soares**  
 Digital image noise can be visualized by converting the image to the Fourier transform. Removal of periodic noise can be done in this image by using band reject and notch filtering. The noise can be reduced by overwriting the larger, noisy integer values with zeros using the two techniques. For removal of motion blur, the Fourier transform of the blurred image is divided by the Fourier transform of a blur image filter defined in MATLAB. By constraining the division to only values in the matrix that pass a given threshold, the lighter areas of the image are less affected, which produces a sharper image with a more accurate contrast and overall more effective deblurring.
- F221 **Riparian Zone Restoration Along the Spokane River**  
**Maggie Harger, Cailyn Connelly**  
 Riparian zones are a necessity when it comes to a healthy river. The Spokane River lacks a consistent riparian zone, which can negatively affect the ecosystem by allowing pollutants or other toxins to enter the water system. A healthy riparian zone consists of deciduous trees, such as cottonwoods that thrive off of saturated soil. With deep roots the cottonwoods help filter pollutants from runoff. Reintroducing native plants and removing invasive species will create welcoming habitats and attract native animals. As a result of research done in previous years, we propose creating a riparian zone demonstration area along the river that would allow for increased education about riparian zones within the Spokane community. By educating the public on the benefits of riparian zone restoration, the people of Spokane will be able to take pride in the Spokane River. By creating this area, future projects can look to this demonstration to see what a proper, healthy riparian zone looks like and how it specifically works along the Spokane River.
- F222 **History and Impact of Central America Study and Service Program**  
**Hannah McCollum**  
 For over 40 years Whitworth's Central America Study Abroad program has expanded perspectives and transformed the lives of students and faculty. In the past year, the need for a history book to collect and make available each generation's stories was recognized. Such a project would do more than record the voices of the past, it would serve to connect today's study abroad participants to the larger context of Whitworth's involvement in Central America, as well as explore the legacy and impact that past study abroad participants have had on the Whitworth community upon their return. Although the itinerary of the program has changed from year to year, what has remained constant is that students (and faculty) embark on an in-depth, transformative experience unique to university programs abroad. Students are asked to do much more than just get their feet wet: depending on the year they have experienced life in war torn countries, language immersion, a one-month poverty home-stay in Honduras, internships in Nicaragua, and traveling without professors during The Plunge. This history book seeks to capture the experiences of study abroad participants and offers a snap shot of each trip, it also includes reflections from staff and students on how studying abroad impacted their personal growth and their futures. We hope that such a book will demonstrate the historic value of the Central America Study and Service Program to students and to the community, and that it will contribute to its continued longevity.
- F223 **Developing a real-time simulation program to improve patient care quality and safety**  
**Marielle Manila**  
 This summer I had the opportunity of working with Gossman Advanced Healthcare Simulation, also known as iNSYTU at Seattle Swedish Medical Center through participation in a Biomedical Internship. The purpose of my project was to develop an 8 step simulation model that allows educators to quickly and efficiently provide refresher trainings for healthcare providers. The model allows hospitals, who don't have advanced simulation teams available, to use simulation pedagogy as an educational methodology to reinforce the skills of already practicing providers. The simulation model was created based on the Just-in-Time training. This methodology stresses the importance of reinforcing skills, especially for high-risk, low-volume therapies that are infrequently performed. Just-in-Time training is based on defining concepts needed to perform a skill that contain only the necessary amount of information to safely perform the skill, while keeping the training within a short timeframe. To intertwine Just-in-Time with simulation, I based the 8 step model on iNSYTU's micro-simulation program as well. This program focuses on performing more individualized simulations where patient care occurs, rather than classroom based settings. Using simulation, providers are able to practice without risking patient care. This program also incorporates the one, do one's theory of simulation through facilitator demonstration and participant simulation. I also integrated the program's concept of debriefing to foster enriching feedback for improvement. Alongside creating the model, iNSYTU and I hosted a conference at Swedish Medical Center Cherry Hill, which introduced the model to over 60 risk managers and clinical educators from all over the country. This allowed them to learn and practice the model to address barriers they face within their hospitals. By practicing the methodology through real life applications, this allowed them to conceptualize the implementation of Just-in-Time simulation trainings in their own respective hospitals and organizations.
- F224 **Wood Duck, Aix sponsa, Real Estate: A Look at Home Buying in the Coeur d'Alene and Pend Oreille Wildlife Areas**  
**Connor Murray, David Goltz**  
 Wood Ducks, *Aix sponsa*, are cavity nesting birds, which is a common adaptation to avoid predation. However, nest cavities are becoming increasingly uncommon as forests are being cleared and burned for development. In order to counteract this decrease in nest sites, nest boxes have been implemented in many wetland areas in order to increase Wood Duck numbers. However, factors that increase the use of nest boxes have rarely been investigated. The purpose of this study was to identify variables that increase nest box use in the Coeur D'Alene and Pend Oreille Wildlife Management Areas. We observed nest box use and sampled habitat at 106 nest boxes across the Idaho Panhandle in July 2016. Following univariate analysis, we fit logistic regression models of nest use as a function of habitat. The best fitting model contained percent bare cover, wetland height, nest tree DBH, average stand DBH, and percent canopy cover as independent variables. Box

use increased as bare cover increased and average DBH, nest tree DBH, and canopy cover decreased, suggesting that less concealed boxes were more likely to be used. We suspect that low concealment of boxes increases the chance that a prospecting female Wood Duck will find and use the box. We also observed that nest box use increased as wetland height increased, suggesting that females placed a greater emphasis on wetland cover for their hatchlings, rather than on nest box concealment. We recommend that wildlife managers focus on placing boxes near wetland sites with tall, dense vegetation.

- F225 Analysis of the combustion of lignocellulosic biomass and the resulting carbon based products.

**Britta Pihl**

Lignocellulosic biomass combustion, i.e. wood burning, has long been a source of heat and energy production in our society. In recent years a new area of this combustion process has become an increasingly important and popular research topic as a result of the expansion of the biofuel/bio refinery industry. In the process of producing biofuels the cellulose and hemicellulose components of the biomass are converted to ethanol and/or other biofuels, while the lignin component is pyrolyzed to produce energy in the form of steam. We investigated the combustion properties of the lignin component of biomass in an effort to evaluate potential side products produced. Furthermore, the combustion of lignocellulosic biomass was also studied in an effort to compare the products produced from pure lignin combustion and those produced from natural lignocellulosic biomass combustion. Our study revealed that both combustion pathways produce potentially harmful polyaromatic hydrocarbon (PAH) and dioxin side products as a result of incomplete combustion of the lignocellulosic biomass. Future studies will evaluate what can be done to minimize these harmful side products.

- F226 Colorful Purification Lab for Organic Chemistry

**Molly Steck**

A two-part lab was developed to help organic chemistry students become familiar with purification techniques. The goal was to design a lab which utilized colorful compounds to allow visualization upon purification. In the first part of the experiment students performed a recrystallization to isolate 9-fluorenone from a solid mixture. In the second part of the experiment students used column chromatography to isolate 9-fluorenone from the same mixture. Success of these separations was gauged by thin-layer chromatography (TLC) and melting point comparison. Using colorful chemicals like 9-fluorenone which is yellow and 2-(4-Dimethylaminophenylazo) benzoic acid (methyl red) allowed visualization of purity and separation of the compounds. Column chromatography could easily be monitored with the colored bands. During recrystallization, the colorful mixture was dissolved by methanol to obtain yellow 9-fluorenone crystals upon cooling. Separation of 9-fluorenone from the colorful mixture with both column chromatography and recrystallization allowed comparison of the techniques. This lab was adopted for Whitworth students in fall 2016.

- F227 Kinematic and muscle activation differences between a standard-pull up and a dynamic CrossFit 'kipping' pull-up

**Nate Porter, Chris Dinunzio, John Van Scoy, Derrick Cordice**

CrossFit introduced the kipping pull-up (KPU) which combines the standard pull up (SPU) with a common move in gymnastics known as the "glide kip". We hypothesized that, additional motion generated by the kipping action of the KPU would significantly reduce the muscle activation in the upper body muscles compared to the SPU, while increasing the activation of hip-flexor and abdominal muscles. This study was a within-subject, randomized, counterbalanced design of 11 male subjects who actively participated in CrossFit. Subjects performed a set of 5 SPU and 5 KPU in random order, while kinematics and muscle activation were recorded. Data were analyzed with paired samples t-tests. The KPU showed significantly higher values for max hip angle, max knee angle, hip range, angular hip velocity, and angular knee velocity. These muscles showed significant reduction in muscle activation from SPU to KPU: LD ( $5.86 \pm 6.21\%$ ,  $p=.046$ ) and BB ( $13.58 \pm 5.62\%$ ,  $p=.018$ ). Whereas, these muscles showed significant increase in muscle activation from the SPU to KPU: RA ( $16.60 \pm 3.55\%$ ,  $p<.001$ ), EO ( $14.57 \pm 3.60\%$ ,  $p=.001$ ), TFL ( $16.24 \pm 7.33\%$ ,  $p<.001$ ), and IL ( $44.54 \pm 31.64\%$ ,  $p=.001$ ). There were significant increases in muscle activation in the hip flexor and abdominal muscles, which generated a significant ant/post swinging. Significant reduction in upper body muscle activation was likely due to this added momentum. A KPU may be a better overall workout because it incorporates more muscles. Additionally, reduced upper body muscle activation could theoretically allow an individual to complete more repetitions with less fatigue.

- F228 Gender Identity: A Comprehensive Look at Spanish Male Gender Identity in The Public Sphere

**Abigail Gress**

This study aims to answer the question of how gender identity is enacted by Spanish males in the public sphere. Through participant observation along with formal and informal interviews, the results showed that Spanish males enact their gender identity non-verbally through greetings, managing space ordering and paying as well as verbally through contrasting masculinity to femininity. It is important that one studies gender identity through the context of the culture in which it is being enacted due to the social construction of gender. Its ever-increasing importance in the public sphere and the laws that are being created based on rigid definitions of what it means to be a man or woman shows that gender identity is a current and fast-moving social issue that deserves immediate attention.

- F229 Does a Split-Step Affect a Baseball Player's Force Production, Muscle Activation, and Overall Reaction Time?

**Kellie Waszak**

A split-step (SPLIT) is a small preparatory hop tennis players use to prime themselves for quick lateral reactions. Though baseball players perform similar lateral reactions, use of a split-step has not yet been evaluated. PURPOSE: The purpose of this study was to determine if implementing a split-step affected reaction time, force production, and muscle activation in baseball players. METHODS: Male subjects ( $n=12$ ) with at least 2 years of baseball experience participated. EMG recordings of the anterior tibialis (AT), medial gastrocnemius (MGAS), lateral gastrocnemius (LGAS), vastus lateralis (VL), biceps femoris (BF), and gluteus maximus (GLUT) were collected. Stationary balls were

positioned in six locations, each 1m from a force plate. Subjects performed three CONTROL and three SPLIT trials. RESULTS: Muscle activation was significantly greater during SPLIT in the up direction for GLUT ( $40.22 \pm 30.29\%$ ), in the up/dominant direction for BF ( $50.92 \pm 24.51\%$ ) and GLUT ( $39.05 \pm 31.75\%$ ), and in the up/non-dominant direction for AT ( $28.65 \pm 22.60\%$ ,  $p < 0.0083$ ). Vertical force production was significantly greater in SPLIT in the up ( $19.36 \pm 10.39\%$ ), down ( $20.40 \pm 21.13\%$ ), and down/dominant directions ( $13.13 \pm 13.15\%$ ,  $p < 0.05$ ). Reaction time and ground shear forces were similar between conditions. CONCLUSION: Increases in muscle activation were seen primarily in variations of the up direction, therefore utilization of a split-step may be more beneficial when reacting towards a high hit ball. The overall trend of shortened reaction time may indicate that a split-step should be implemented, however practice is key.

- F230 Positionally scanned peptide libraries for exploring selective binding of CGRP analogs for CLR:RAMP1

**Briana Ledoux, Chris Daniels**

Nearly thirty million Americans suffer from migraines every year. Despite such prevalence, the etiology of migraines on the molecular scale remains largely unknown. The role of the G-protein-coupled receptor CLR:RAMP1 and its ligand CGRP in the mechanism underlying migraines have come to the forefront. Therefore, the goal of this investigation is to determine which amino acids of the CGRP ligand sequence dictate binding specificity for the CLR:RAMP1 complex. In order to learn more about this binding selectivity, a peptide library was designed that is comprised of 20 sub libraries that together created 625 total CGRP analogs, each of which differed from the CGRP parent ligand by up to four residues. These analogs were synthesized in lab via solid phase peptide synthesis, and will be analyzed using a competitive binding assay. This assay will contain the CLR:RAMP1 complex, the parent CGRP ligand, and the CGRP analogs to see which analogs bind better or worse than the parent CGRP ligand to CLR:RAMP1. Key binding amino acids can be identified based on which analogs bind well to CLR:RAMP1 and which do not. If these important binding amino acids could be determined, then this information could contribute to future research for synthesizing a peptide-based treatment for migraine pain.

- F231 Mycobacteriophage Sensitivity and Insensitivity

**Elizabeth Grainey, Cyla Sparks, Ian McGowen, Vina Tran, Ashley Beausoleil, Jerry Sicalo**

Human diseases like the cold, flu, chickenpox, and HIV are caused by viruses. But viruses don't only infect humans, they can also infect bacteria! Viruses that infect bacteria are called Bacteriophages. Bacteria already infected by a virus are often times resistant, or insensitive, to infection by other phages through a phenomenon known as superinfection immunity. Over several billion years the bacteriophage-bacteria relationship has created constant selective pressure for bacteria to evolve ways to escape viral infection and death. While many of these escape mechanisms, such as repressor based immunity, restriction enzymes, and CRISPR are well understood, many more mechanisms are waiting to be discovered and explained. This research investigates additional mechanisms of bacterial insensitivity caused by previous phages infections. Student researchers are screening the Gonzaga library of phages for interesting targets and investigate the mechanisms of insensitivity.;

- F232 Determination of Calcium and Phosphorous Levels in Riparian Sediment at the Verbrugge Environmental Center, near Spokane, WA, USA

**Rebecca Casey**

Phosphorous and calcium are common sediment properties that drive sorption reactions. In this study, sediments from the Little Spokane River located in the Verbrugge Environmental Center, about 35mi. northeast of Spokane, WA, USA were collected on September 21, 2016 and January 18, 2017 and analyzed. Phosphorous was extracted from sediments using nitric acid/hydrogen peroxide solution and subsequently analyzed by the ascorbic-acid molybdenum blue method. Calcium was extracted from sediment using ammonium oxalate-oxalic acid solution and subsequently analyzed by flame atomic absorption spectrometry. Total phosphorus content of sediment averaged 3.57 mg/kg. Ammonium oxalate extraction was, however, not successful for calcium. It is, therefore, recommended to use other extraction procedures such as the Mehlich in future studies.

- F233 A Series of Pressure Loss Curves Following Absorption in an Ovonic Metal Hydride Canister

**Daniel Padrnos**

The performance of a metal hydride, and of an engineered metal hydride-based hydrogen storage container, is a function of several parameters including alloy formulation, size of canister, internal passive heat exchange, outer pressure vessel design and state-of-fill. The last parameter listed, state-of-fill, is investigated in the present study. The pressure loss as a function of time following the closing of a hydrogen pressure valve during an absorption is a function of the state-of-fill. How "thirsty" the metal hydride is for new hydrogen depends on how empty the container is. If the container is close to the empty side of its reversible capacity, then the pressure drop from charging pressure (270 psig) to equilibrium plateau pressure is fast. If the container is close to being full, then the drop from charging pressure to plateau pressure takes a long time. The implications of this time effect are that future hydrogen car designers (and users) will have to understand that the re-fueling time is a function of how full or not the tank is. Several methods for increasing the fueling rate include active heat exchangers inside the engineered tank, at the risk of leaks and increased cost. The current investigation will present pressure loss as a function of time following absorption, and a discussion of the time implications of this data.

- F234 Decadent Immersion

**Devon Clements**

Decadent Immersion is a collection of short fiction and poetry, which encapsulates the mental and physical struggles of remaining sane and authentic in a world overcome with falsehood. The forms and structure vacillate greatly within the collection and allows a glimpse into many aspects of personal and group struggle through a variety of mediums. In this given contextual moment, it is as important as ever before to reclaim the truth behind the diction that seems to be slowly slipping away from realism. By attempting to directly face the issue through language I have endeavored to recapture the essence of expression and human emotion through the very form I believe is

degrading. The thematic elements themselves vary wildly and could be construed as separate entities but I believe they are united in their authorial intention. My collection, merges both themes as well as structure choices, I have strived to create an accessible, as well as powerful group of literary work. The thematic elements I deploy are united by their central placement within legitimate human expression and inter-cultural dialogue. Many of the texts in this volume have stemmed from personal experience and mental challenges facing a large body of the world's population. I have collected a group of work, which reaches far and deep in the community around me as well as the larger audience globally. Without language we have no way to communicate across vast distances, both geographically as well as to the core of what it means to be human.

F235 Increasing the Educational and Recreational Value of the Spokane River: A Study of the Logan Neighborhood

**Jason Oestreicher, Wenni Zhao, Amberlyn Olsen**

Compared to other stretches of the Spokane River, the section that passes through the Logan Neighborhood between Avista and the Iron Bridge appears to be less accessible and less utilized as a recreational and educational resource. Some possible reasons for its lack of use by the community may include poor accessibility, and safety concerns such as transient camps in the area. Efforts are currently underway by groups including the University District Ecological Alliance and students from Gonzaga University and Eastern Washington University to improve this section of river and make it more valuable to the surrounding neighborhood. The goal of the current research project is to survey the stakeholders in the Logan neighborhood to ascertain why the river isn't more widely used and what features would increase its educational and recreational value to them. This goal will require not just assessment of community concerns, but also communication of those concerns with appropriate agencies such as OSPI, EEA, the City of Spokane, and parties that have jurisdiction or ownership of the property along the river. Working with these agencies, we will have the opportunity to assess the challenges and solutions regarding environmental education and legal constraints. Through the combination of this research and consultation process, we hope to identify potential access points and opportunities for educational experiences.

F236 Family Life, and Career After Graduation: Can You Have It All?

**Jennifer Klein**

In this study, I am determining how Gonzaga students perceive their future ideals and predictions. Twelve Gonzaga University undergraduate students have been interviewed to determine how they see themselves in the near and far future in terms of family life and career ideals. The students interviewed are from all four-class levels, a variety of major disciplines, and of both genders. This study looks at student's priorities for the future and how they make decisions at Gonzaga based on those ideals. There are several variables studied such as religious background, gender, class-level, family background, majors, campus involvement, and social groups. In particular, the concept of stay-home moms/stay-home dads is studied as well as how they perceive they will raise their future children. This study looks at how students define and identify success in their lives and if a career is necessary to have success. ; This study also compares different directions Gonzaga students choose to go in in their future careers. Gonzaga students speak about both their future choices and their perceptions of student's future choices at other universities. This study was created in hopes of identifying key factors in why students choose certain fields and lifestyles.;

F237 A Simple, Web-based Tool to Monitor Spring Waterfowl Migration in the Channeled Scablands of Eastern Washington.

**Luke Wilde**

Monitoring the timing of spring waterfowl migration and the abundance and distribution of species is critical to their conservation and management. If critical stopover sites can be identified and characterized during spring migration, managers can develop specific conservation strategies for those areas in real time. In Spring 2016, Washington Department of Fish and Wildlife (WDFW) and multiple Washington waterfowl organizations began conducting extensive ground surveys within 6 areas of the Channeled Scablands in Eastern Washington. Birds were surveyed 11 times, from February to late April, along defined driving routes or individual wetland locations. Total counts of waterfowl, by species, were summarized for each sub-area in the route, generating extensive data sets for each observation date. We used R and R Shiny to develop a web-based tool that biologists and stakeholders can use to explore spring waterfowl migration across time and space. The tool is available from any Internet browser and allows the user to interactively visualize waterfowl abundance within user-specified date ranges on a variety of interactive maps of the Channeled Scablands. The tool provides biologists with a standardized data entry protocol, generates abundance summaries by species, and can be maintained to provide rapid exploratory analysis while migration is underway.

## Dance and Performing Arts Presentation

### D101 Loie Fuller and the Collaboration of the Arts at Gonzaga

#### **Elaina Pignolet, Angelica Gomer**

Loie Fuller was a revolutionary dancer, performer, and interdisciplinary artist, peaking in fame at the turn of the nineteenth century. She is accredited for inventions in costuming, and stage lighting, as well as contributions to modern dance and the art nouveau movement. Loie was a collaborator, bringing in multiple disciplines and creating connection across fields of science, dance, visual art, and more. Despite her impressive life full of self-made fame and powerful friendships, her name is not as commonplace in performing arts communities as one would guess. Her influential performances seemed to have died along with her. Though documentation of her life in books, collaborating with scholars, and connections with Maryhill Museum of Art, a holistic understanding of her significance to the arts can come about. This project provides information to the community of Spokane and Gonzaga University on the magnificent life of Loie Fuller. The compiled research on the life and works of Fuller inspired and contributed to an exhibit in the Jundt Museum, as well as a reconstruction of one of Fuller's original works performed by Gonzaga University students, which serve to inform and inspire others in the arts, and the Spokane community in general.

### D102 Crafting personal and national identity through dance

#### **Molly Foster**

Throughout history, dance has made its mark as an important cultural and physical aspect of society. It has also helped to create national identities in different countries all over the world for hundreds of years. Dance can be absolutely personal and unique to one's own emotions and desires, but it can also be shared between pairs, groups, and even entire countries. From local folk dances, to nationally known dances, to the court dances of 18th century Europe, dance has the power to influence more than just those dancing. It is able to reach beyond this level, and have significant political and social effects. Through scholarly articles and journals, personal experience, and visual media, I hope to bring to light some of the most important outcomes of dance that we can see in both current and past societies. Looking at dance through a multicultural or cross-cultural lens will give us an entirely new perspective of the power and influence of dance around the world, and it can show us that we are all much closer to each other than we might think. We know that dance has been a factor of society since the dawn of time, and it has only grown and developed into something bigger and lovelier, but it has also grown into something that can make strong statements both for and against societal norms, and these types of growth are what I plan on exploring in this presentation.

### D103 Our Legacy from the Past

#### **Janine Warrington**

After two years of working with the script *Weaving Our Sisters Voices*, an original work which details several stories of women in the Bible, I am arguing that it is incredibly important that such stories be taught in church. There is a handful of Bible passages used in the lectionary, and even in churches where the lectionary is not followed this same limited pool of passages make up the majority of references used in sermons. Using the gruesome example of the story of the Levites concubine in Judges 19 as a specific example, I suggest that passages which seem unappealing are essential in our full understanding of God and of the human experience, and therefore church congregants ought to be exposed to them. My research suggests that these lesser-known stories resonate with people personally and open up the way for authentic conversation between those people who are engaging with the text. My claim is that spiritual leaders and especially Christian pastors should be less afraid of addressing such passages and that including them in Sunday sermons would be beneficial for their congregants. I will use my experiences discussing the stories of *Weaving Our Sisters Voices*, including the story of the Levites s concubine, with performers and audience members alike as anecdotal evidence to support this claim.

## Poster Session 3

### S101 Wnt5a induced protein depalmitoylation is required for cell movement in Zebrafish (Danio Rerio).

#### **Phillip Bax**

Polarized cell movement is critical for embryonic development and metastatic disease. The noncanonical Wnt pathway regulates cell polarity and polarized cell movement, but the molecular mechanisms are not well understood. We find that protein depalmitoylation promotes cell migration/invasion during embryonic morphogenesis and cancer cell invasion. Additionally, Wnt5a promotes depalmitoylation of the melanoma cell adhesion molecule (MCAM) and a point mutation in cysteine 590 specifically blocks MCAM palmitoylation. This mutation increases dynamic polarized MCAM localization and cell invasion. Directly altering expression of the basal protein palmitoylation machinery is sufficient to augment directional cell movement in three dimensional collagen invasion assays and during Wnt regulated morphogenic cell movement in zebrafish embryos. Additionally, tumor derived mutations in palmitoyl transferases also decrease protein palmitoylation and have impaired the ability to suppress cell invasion. Our results suggest that protein depalmitoylation is required for efficient directional cell movement during vertebrate morphogenesis and in cancer progression.

### S102 Weapon Performance of Rhinoceros Beetles

#### **Benjamin Buchalski, Eric Gutierrez**

Sexually selected weapons are found in a multitude of organisms. Using Rhinoceros Beetles, we aim to understand the selective pressures responsible for these sexually selected weapons. By looking at these horns as a functional system, we can quantify weapon (horn) performance by analyzing the muscles and lever mechanics associated with force; as well as the material properties of the cuticle, which

influence the overall performance of the horn. Analyzing performance data in tandem with horn and body size will allow for a second-order polynomial regression to identify potential patterns of selection.

S103 Analysis on the Effects of Whole Bovine Milk Ingestion on Salivary Cortisol Concentration in College Students

**Celeste Campos, Ciara Fletcher, Emily Walzer**

Dairy cows under stress are known to produce milk with increased cortisol levels compared to undisturbed dairy cows. Yet, current research has not fully explored the effect that consumption of bovine milk has on human cortisol levels. As whole milk is a common household substance, a significant correlation would create health concerns for many consumers. Too much circulating cortisol can cause negative bodily effects, such as Cushing's syndrome and high blood pressure. This research explores whether whole milk causes human salivary cortisol concentration to increase, decrease or remain the same compared to ingestion of an equal volume of water. Research was conducted with the hypothesis that the control and the experimental salivary cortisol would not exhibit a significant difference in concentration. Each subject's cortisol was collected in a specimen cup. Cortisol concentration in saliva was analyzed through the use of an ELISA cortisol concentration kit. The obtained results reveal no significant increase in salivary cortisol levels with consumption of whole milk, compared to that of water. These results suggest that whole bovine milk ingestion has no significant effect on human salivary cortisol levels.

S104 Quenching of the Cerium-Catalyzed Bromate-Ethylacetoacetate Oscillation Reaction

**Tamiya Tisdale**

The cerium-catalyzed bromate-ethyl acetoacetate oscillation reaction was studied to determine which salts could quench the reaction. Oscillation reactions are important to study because they are like the mental illness bipolar disorder. Making connections between the two can help us in treating this illness. An oscillation reaction is a mixture of chemicals that goes through a sequence of redox potential changes and color changes that repeats regularly. In the reaction studied, the cerium ion undergoes changes in oxidation states that have green, blue, violet and red colors which continually rotate throughout the reaction. Through this study, the oscillations were monitored using an oxidation reduction potential probe. By graphing in real time of the ORP potentials, oscillations were seen to increase to 1200 mV and then to suddenly drop down to 1000 mV and this pattern continued. When the potential remained constant after the addition of the salt solution the reaction was quenched. It was found that of the 23 salt solutions tested, 13 could quench the reaction.

S105 Phosphorous Sorption of Little Spokane River Sediments Under Aerobic and Anaerobic Conditions

**Alyson King**

Adsorption and desorption characteristics of phosphorous (P) in river bed sediments are important indicators of the health of the river ecosystem. In this study sediments from the Little Spokane River were used in batch experiments to characterize their P adsorption and desorption under aerobic and anaerobic conditions. Aerobic and anaerobic conditions were maintained in batch samples of sediment after four weeks of incubation under O<sub>2</sub> and N<sub>2</sub>, respectively. The O<sub>2</sub>- and N<sub>2</sub>-conditioned samples were equilibrated with varying concentrations of P (as KH<sub>2</sub>PO<sub>4</sub>) for a 24-h period. P remaining in water column after equilibration were measured. Desorption experiments were carried on the residual sediment using filtered river water after decantation of the supernatant. The sorption process fitted the Freundlich and Langmuir models with R<sup>2</sup> > 0.90 for both aerobic and anaerobic conditions. Ratios of P retained to the P adsorbed (Pr/Pad) were 88% and 60% under aerobic and anaerobic conditions, respectively. These results showed that a higher percentage of P was sorbed by the sediments under aerobic conditions.

S106 The Effects of Contingent Rewards on Decreasing Talk Outs for a Middle School Student with an Intellectual Disability in a Self-Contained Classroom

**Katie Bellefeuille**

This study's purpose was to evaluate the effects of contingent rewards on decreasing the number of talk outs of a 12-year-old middle school boy in a self-contained classroom. The participant had an intellectual disability and engaged in high rates of talk outs during class time that reduced his learning ability. Event recording tallied the total number of inappropriate talk outs during a 10-minute session. The design used was a reversal to track the effectiveness of the contingent reward system. Before a session started, the participant was told that if he talked out 5 or less times during the teacher's lesson, he would be rewarded with 3 classroom bucks. Then the participant listened to the teacher's PowerPoint presentation. A tally was marked every time the participant talked out. At the end of the 10 minutes, the tallies were counted. If the participant had 5 or fewer talk outs, 3 classroom bucks were given to him. If the participant had more than 5 talk outs, no classroom bucks were given. The results showed an average of 15 talk outs during the first baseline which decreased to an average of 3 during the first intervention. Baseline 2 had an average of 8.6 talk outs which decreased to 2.25 in intervention 2. This study showed that providing a maximum goal of talk outs with a contingent reward once that goal was met dramatically decreased the participant's number of talk outs. The contingent reward intervention was extremely easy to use within the classroom setting.

S107 The Effects of a Direct Instruction Flashcard System on Sight Word Recognition for a 1st Grade Female Student with Developmental Delays

**Katherine Sumantri**

The purpose of this study was to implement and evaluate a Direct Instruction (DI) flashcard system and Precision Teaching techniques to increase the fluency and accuracy of sight word acquisition to a 1st grade female student who is developmentally delayed. The participant was a 1st grade student who qualified for special education services under the developmental delay category and read at a Kindergarten level. The setting was a resource room and the project was taught at a table with one-on-one instruction. Event recording was used to record the participant's correct and incorrect responses within a changing criterion design. Intermittent goals were set to gradually increase



the number of sight words. At each goal level mastery of the set number of sight word had to occur for at least two sessions. Steady growth was established across 15 sessions of intervention. DI Flashcards was an efficient and effective teaching method to increase the amount of sight words for a first grade student with developmental delays.

S108 The Effects of Direct Instruction Flashcards on Sight Word Recognition on an Eight-year-old Girl with a Developmental Delay

**Ilynn An**

The purpose of this study was to evaluate the effectiveness of Direct Instruction Flashcards combined with Precision Teaching measurement tools on the number of correct sight words for an eight-year-old girl who has a developmental delay. The participant exhibited low reading skills in her classroom. Event recording within a changing criterion design was used to record the number of correctly read words. For the DI Flashcard system, each of the flashcards were presented in random order and presented to the participant for the same amount of time. Each of the words was first presented to her and she had to correctly state the word to the researcher within 5 seconds. If an error occurred, the researcher corrected the response and represented the missed word multiple times to show the participant's independent response. The DI flashcard system results showed that the participant dramatically increased the number of correctly read words within 17 intervention sessions. The Direct Instruction Flashcard system was very cost effective and a positive intervention for the participant to learn necessary sight words.

S109 Temperature Loss Data for Two Metal Hydrides in Engineered Hydrogen Storage Containers: Prediction of Temperature Loss for Future Designs

**Evelyn Cooper**

One of the problems with using metal hydrides to store hydrogen for some applications, including cars, is that the absorption and desorption of hydrogen is a thermodynamically controlled process. For the metal alloys considered for use as storage media, the absorption of hydrogen is an exothermic process. Because the rate of fill of a tank in a typical application needs to be as fast as possible (for consumer convenience), the need to remove exothermically generated heat is a current engineering challenge. Similarly, discharge of hydrogen from a metal hydride storage container absorbs heat from the surrounding and makes the engineered tank cold, slowing down the rate of hydrogen egress. The current research is aimed at studying the temperature loss data for two current canister designs, and proposing heat loss functions which model the heat loss. The data can be used to preliminarily create heat transfer models which help predict heat loss from larger containers (similar to which may be proposed for future cars) and for a different hydrogen storage alloys. Graphs of temperature loss as a function of time and as a function of hydrogen desorbed will be presented. Equations which predict temperature loss are proposed. Temperature loss as a function of state-of-fill will be preliminarily discussed.

S110 The Effects of Oxidation States of Praziquanamine Derivatives on the Activity of Human Aryl Sulfatase B

**Sarah Zeitler**

Mucopolysaccharidosis VI (MPS VI) is a lysosomal storage disorder in which the glycosaminoglycan's are unable to be broken down due to a deficiency in the arylsulfatase B protein. Chaperone therapy is being studied as a possible method of treatment for this disease. Praziquanamine is one possible chaperone, which is a derivative of praziquantel that has been shown to affect the activity of arylsulfatase B in mice in studies not focused on MPS VI. Thus, it appears to be an ideal base for a potential chaperone. Praziquanamine and reduced praziquanamine were synthesized and used to produce derivatives through reactions with benzoyl chlorides and aldehydes. These purified and synthesized derivatives were tested for their effect on the human enzyme arylsulfatase B. Comparisons of praziquanamine derivatives of different oxidation states were made to be used to determine future derivatives to be synthesized.

S111 A critical discourse analysis of the LA Times article, "Sanctuary Cities: How Kathryn Steinle's death intensified the immigration debate."

**Michaela Arnold**

The United States citizenry imagines itself as a welcoming community built on trust, compromise and acceptance. American history books describe the US as a country once founded on immigrants hoping for a New World of religious, political and economic freedoms. These hopes and yearning for freedom of life create a universal Promise Land. Yet, the US is experiencing a different world than when the country was first established. War, terrorism, sickness, death and fear are poisoning our hearts and driving out our trust in our fellow human beings. Sanctuary cities have become a large topic of discussion in the past decades. On the one hand, there is a logic of fear, with internal turmoil and fear of international relations. On the other hand, there is a need and obligation for humanitarian efforts of wanting to cherish and help those in need. Sanctuary cities are cities in the US that shelter undocumented immigrants from ICE (US Immigration and Customs Enforcement). These cities have carried a wide variety of discourse surrounding the topic of immigration. Sanctuary cities are a very prominent discussion and policy in our changing society but what sticks out most is how we as a society of different ideas, positions and opinions on immigration speak about undocumented immigrants. Public discourse surrounding sanctuary cities can reveal some of the nation's greatest hopes and most pressing fears with regards to immigration policy. My critical discourse analysis will closely examine an LA Times article on Sanctuary cities for emergent discourses on immigration following the death of Kathryn Steinle. She was a 32-year-old resident of San Francisco, California who was shot and killed by Juan Francisco Lopez-Sanchez, a five time deported undocumented immigrant who found refuge in San Francisco, a sanctuary city.

- S112 **The Effects of the Model, Lead, Test Procedure on Signing the Alphabet for Two 7th Graders with Down Syndrome**  
**Noelle Winter, Katherine Sumantri, Emily Mincin**  
 The purpose of the study was to implement and evaluate a Model, Lead, Test procedure with flashcards to increase the fluency and accuracy in signing letter names for two 7th graders with Down Syndrome in a self-contained classroom. Target letters of the alphabet were chosen based on letters that occur most frequently in words. Event recording was employed to count the total number of correctly identified letters in sign language within a changing criterion design. For intervention, the researcher held one letter flashcard with one hand and simultaneously modeled the sign for the corresponding letter with the other hand. The participant was then asked to sign the letter at the same time as the researcher. The researcher then instructed the student to "Get ready" and presented the same flashcard with the instruction "Your turn!". The participant signed the letter independently, signifying the Test portion of Model, Lead, Test. The Model, Lead, Test procedure helped both participants improve their ability to correctly sign shown alphabet letters. One participant learned 11 letters and the other learned 5 within 11 teaching sessions. A functional academic skill of identifying letter names was effectively taught using a Model, Lead, Test intervention strategy for two participants communicating with sign language.
- S113 **A Histological Comparison of Ear Skin Regeneration in Acomys and Mus**  
**Aaron Sandoval**  
 Regeneration has been studied almost exclusively in lower invertebrates as most mammals are only able to regenerate fetal tissue. The African spiny mouse (*Acomys*) represents the first time advanced regeneration has been observed in an adult mammal. The regenerative capabilities of *Acomys* are being studied by comparing it to a normal mouse (*Mus*). Ears of both species were wounded using a four-millimeter punch to remove the epidermal and dermal tissue layers, revealing the underlying cartilage. The ears were harvested and embedded in wax, mounted on slides, and trichrome stained to differentiate between erythrocytes, muscle and collagen. Microscopic analysis revealed that although the cartilaginous layer eventually degenerated in both species, extensive degeneration was present much earlier in *Mus*. Significant scarring was evident in *Mus*, while no scarring was observed in *Acomys*. The results of further study of *Acomys* could prove integral in gaining a comprehensive understanding of the regenerative process.
- S114 **Most Economical Common Dissection of a Square and Equilateral Triangle**  
**Trent DeGiovanni**  
 The Wallace-Bolyai-Gerwien theorem states any polygon can be decomposed into a finite number of polygonal pieces that can be translated and rotated to form any polygon of equal area. The theorem was proved in the early 19th century. The minimum number of pieces necessary to form these common dissections remains an open question. In 1905, Henry Dudney demonstrated a four-piece common dissection between a square and equilateral triangle. We investigate the possible existence of a three-piece common dissection. Specifically, we examine possible dissections in which all of the polygonal pieces are convex.
- S115 **Salt Quenching of an Oscillating Cerium-Catalyzed Bromate-Malonic Acid Reaction**  
**Nikki Olsen**  
 Oscillation reactions may be used as models for biochemical responses in the body. They simulate a lack of homeostasis, such as what occurs in bipolar disorder. Therefore, understanding the role of salts in quenching oscillating reactions may be helpful in developing new salt-based medications for treatment. This research focuses on the study of an oscillating cerium-catalyzed bromate-malonic acid reaction in relation to quenching with various salts. Quenching occurs when the reduction potential stabilizes and the color change of the reaction ceases. Attempts at quenching utilized water and 22 alkali metal, alkaline earth metal, and organic based salts. Potassium oxalate and sodium iodate did not quench the reaction. The other 20 salts did quench, and the data infers that the anion rather than the cation is the determining factor in quenching. Results were analyzed by reduction potential measurements and UV Vis spectrophotometry.
- S116 **A Critical Discourse of the Chilling Effect of Nuclear Weapons on International Relationships**  
**Shelbie Blevins**  
 On January 24, 2017, a news satire show, Zondag Met Lubach, (Sunday with Lubach in English), released a video spoof to officially welcome US President Donald Trump. The video mocks Trump's voice expressions, and applies his words in a Netherland's context. For example, this is the Afsluitdijk. It's a great, great wall that we built to protect us from all the water from Mexico. While the parody generated comedic relief to Trump's inauguration speech, it also articulated the inequitable relationship between two countries the United States, which has the most powerful military in the world, and the Netherlands, which has a much lower military power ranking.; This type of relationship resembles what I think to be a common, global power dynamic concerning nuclear weapons. There's a part of global reputation that is influenced by nuclear weapons and the policies thereof. Sort of like the framework of national gun control, but on a global scale.; This research paper will analyze the chilling effect of nuclear power on international relationships. It will investigate the reverence for countries with numerous nuclear weapons verse countries with very little to none at all. Studying the ways in which nuclear power is treated, valued, and manipulated across borders to better understand international relationships influence by power structures.
- S117 **Space to Wonder**  
**Janine Warrington**  
 I am using the space between panels in traditional comics formatting, as seen in comic strips such as Charles Schulz's Peanuts, and graphic novels such as Art Spiegelman's Maus, as a visual metaphor for the ambiguity and doubt necessary in healthy faith development. Comics expert and historian Scott McCloud describes the importance of this space, referred to as "the gutter" by explaining that readers are provided with two definite moments as drawn in the panels, but have to draw conclusions about what happens in the space in-between. Likewise, I argue that Christians have to enter into the gaps between definite moments in Scripture in order to interpret the text. Part of this

process is the admission that one cannot definitively understand the mysteries of God or the Bible. While such admission tends to be a very difficult experience, I argue using the psychological theories of John Westerhoff and James Fowler that without this experience, one cannot reach a place where they truly own his faith. Early on in faith development, we learn to affiliate with others who share our faith, but until we probe and question what we are taught, we cannot come to the point where we fully believe what we are taught. Finally, I offer an example of how to utilize this visual metaphor by sharing a connected project of my own in which I reflect on the importance of doubt in faith development through a narrative presented in graphic novel format.

S118 Effect of Different Side Chains on the Zinc-Binding Properties of Lanthanide Complexes

**Zachary Steinberg**

Several studies have shown that a significant reduction in the concentration of zinc occurs prior to the onset of aggressive prostate cancer. Monitoring zinc levels via Magnetic Resonance Imaging (MRI) could provide an effective screening method for prostate cancer by comparing zinc concentration in the patient, to the known standard concentrations in non-cancerous prostate tissue. The aim of this project is to develop a series of lanthanide-based MRI agents capable of monitoring zinc levels in the prostate. The preference for MRI over other biomedical imaging techniques stems from its non-invasive nature as well as its ability to produce high resolution images of soft tissue. The proposed complexes will contain a lanthanide metal which will give it MR properties, and a zinc binding side arm that will play a key role in determining zinc concentration. To date, two europium complexes with different side chains have been synthesized and characterized using  $^1\text{H}$  and  $^{13}\text{C}$  NMR. Future work will include the analysis of their various zinc-binding properties using UV-Vis Spectrophotometry, Luminescence Spectroscopy, and NMR Spectroscopy. Further investigations into the complex stabilities, and selectivity for zinc over other biologically relevant metal cations, will also be carried out.

S119 Identifying Sites of Courtship Pheromone Production in Plethodontid Salamanders

**Justin O'Farrell**

This study was undertaken to determine the origin of courtship pheromone production in plethodontid salamanders. In nearly all species of salamanders, fertilization is internal and sperm transfer occurs via a spermatophore that is deposited and collected by the male and female salamander, respectively. In the family Plethodontidae, most species rely on the linear tail straddling walk and pheromonal communication to convince the females to pick up the spermatophore that they have deposited. The pheromones are vital to this courting process as they enhance female receptivity by decreasing the total duration of the tail-straddling walk. Pheromone production from tail-base glands has never been documented in plethodontid salamanders. Using the knowledge that *Aneides ferreus* salamanders participate in a circular tail-straddling walk rather than a linear tail straddling walk, this study utilized both in situ hybridization (ISH) as well as immunohistochemistry (IHC) to target glands producing courtship pheromones in both male and female salamanders. The results of the ISH protocol were inconclusive due to unsuccessful binding of our probe to the targeted tissue, or a multitude of other factors. The IHC protocol yielded more results showing positive binding of the antibodies in use to the granular glands that were hypothesized to be the source of pheromone production. Research will continue in order to produce repeatable findings.

S120 Luminescence of Rhenium Tricarbonyl Complex containing a Dihydroxyphenanthroline Ligand

**Jessica Bixby**

Current cancer bio imaging techniques utilize the fluorescent nature of various organic compounds. However, organometallic compounds have a number of advantages including longer lifetimes and stability compared to traditional imaging agents. In particular, rhenium tricarbonyl complexes are biologically stable and exhibit fluorescent behavior. This research focuses on the luminescence of a rhenium tricarbonyl complex containing a 4,7-dihydroxy-1,10-phenanthroline ligand. Fluorescence was quantified for excitations at both 330 and 420 nm. The efficiency of fluorescence was determined by calculating the quantum yield of the 420 nm excitation. A significantly high quantum yield of 0.012 indicates promise for using  $\text{Re}(\text{CO})_3(4,7\text{-dihydroxy-1,10-phenanthroline})$  hydroxide for bio imaging and this complex has exhibited a pH dependency that can be useful in fluorescence selectivity.

S121 The Use of Model Lead Test Retest on a Developmental Impairment Student to Increase Street Sign Recognition

**Heather Stanley, Jill Barta**

The purpose of this study was to determine the effect of a model, lead, test, retest program on a middle school student with a developmental impairment to increase street sign recognition. The participant was mostly nonverbal however used American Sign Language along with spoken words to communicate and was a refugee from Africa with non-English speaking parents. The dependent variable was the participant correctly identifying the shown street sign name by using American Sign Language as the communication mode. Event recording scored correct behavior within a changing criterion design. Twenty-five street sign cards were prepared with a picture of the ASL sign. The intervention consisted of a model, lead, test, retest system to increase the identification of street signs. The participant was shown a card with a street sign as well as the American Sign Language equivalent. The project was very successful because the results showed 23 correct street sign labels within 14 intervention sessions. The participant learned the signs very quickly. This study showed that individuals with a developmental impairment who receive direct model, lead, test, retest, instruction can respond very quickly to for labeling tasks.

S122 The Effectiveness of Direct Instruction Semi-Concrete Counters on Adding Negative Integers for a High School Female in a Resource Room

**Calle Sullivan, Katherine Ruff**

The purpose was to evaluate the effectiveness of an adapted Direct Instruction Mathematics Semi-concrete Counter Subtraction Strategy on adding negative integers of a high school student in a Special Education Resource Room. The participant was a 14-year-old ninth grade girl with a learning disability who attended a resource room for extra mathematics instruction. The target behavior was when the sum of a problem with the accurate integer value as well as the correct sign (positive or negative) was written. A 10 problem worksheet had 2 and a

half minute timings which resulted in permanent product data collection. The design was a reversal (ABAB) design. Semi-concrete counters, which are vertical lines representing a quantity number in a problem, were introduced as a strategy to solve addition problems with negative integers. First, the participant would draw the correct type and value of counters to represent the first addend. Working from right to left, the participant would then cross out or add counters to the already drawn counters with the correct type and value of counters to represent the second addend. The counters that had both a minus sign and a horizontal counter cancelled each other out for a value of zero. The participant counted the remaining counters to represent the sum. During baseline, low numbers of correct problems were completed while during intervention higher numbers were completed to mastery. Adapting the Direct Instruction counter subtraction method was successful in teaching adding negative integers and had provided a new instructional strategy.

S123 The Effects of a Direct Instruction Flashcard System on High-Frequency Sight Word Recognition for a 10th grade male student

**Natalee Amaro, Jessica Johnson**

The purpose of this study was to evaluate the effects of a Direct Instruction Flashcard system on the sight word acquisition of a high school male with a specific learning disability in a resource room. The participant was a 15-year-old male in tenth grade student with a Specific Learning Disability. Event recording was implemented within a multiple baseline design across sets of words assessed the amount of correctly read sight words. The DI Flashcard system used a combined word deck of mastered and unmastered words. Each word was individually presented. If an error happened, the researcher employed a Model-Lead-Test correction procedure and then continued with the missed word represented multiple times to ensure correct repeated readings. For all word sets, mastery was reached and maintained. The DI Flashcard system was an effective teaching procedure to increase the number of correctly read sight words for a high school male with a Specific Learning Disability.

S124 A Fracture Mechanics Based Approach to Hydrogen Fatigue.

**Zachary Gustlin**

Hydrogen embrittlement occurs when hydrogen diffuses into a metal such as 304 stainless steel. Hydrogen gathers at grain boundaries and defects, leading to possible mechanical properties changes that are considered deleterious. For example, the strength and ductility may be negatively affected by reduced ability for dislocations to move when hydrogen is trapped along dislocation lines. The current work is based on using fatigue data to estimate possible mechanical properties changes from hydrogen exposure. A fracture mechanics based approach uses crack propagation rate ( $da/dN$ ) analysis to determine if hydrogen has affected the mechanical properties. The current research is important for leading to the development of a materials properties database, specifically dedicated to hydrogen-exposed materials. The data may help predict the fatigue life of steel with different levels of hydrogen exposure. Data was gathered using a fatigue tester with 304 stainless steel specimens exposed to the following amounts of hydrogen: virgin (no exposure), 1 week at 1 atm of hydrogen, and fully saturated with hydrogen. The data is represented as graphs of the average crack growth rate per stress intensity factor and cycles till failure versus amount of hydrogen. The preliminary data may be used for a possibly more accurate prediction of fatigue life of hydrogen-exposed steels.

S125 Analysis of Helical Beams

**Joseph Jesse**

The project aims to utilize computer software in a parametric analysis of loading on helical shaped beams. The study is aimed at providing engineers with simplistic tools capable of modelling helical shaped beams by finding correlations in the resulting stress values and design parameters. A common example of this type of beam can be seen in spiral staircases. Data was collected using Visual Analysis, a structural analysis and design software. Beams were drawn in CAD and exported into VA for study. Data was then aggregated in excel and analyzed for trends. Beams varying in radius in height were analyzed for a range reasonable to practical applications. The analysis of the data may include normalizing the height and radius in terms of appropriate variables so that stress may be found as function of these variables. Effectively, this process would expedite the job of designing helical shaped beams by providing a quick and efficient method for determining the critical stresses.

S126 Activating Transcription Factor 5 (ATF5) Stimulates Autophagy in Various Mammalian Cancer Cells

**Robert C. Murillo**

Autophagy is a cellular process in which a cell breaks down intracellular organelles, proteins, and other cellular components within autophagolysosomes for reuse. Deregulation of autophagic function plays a causal role in aging as well as in multiple diseases including cancer, diabetes, and several neurological disorders. Activating Transcription Factor 5 (ATF5) has been known to regulate cellular proliferation, differentiation, and survival. The ATF5 gene produces the ATF5 protein that is found in high concentrations in malignant cancer cells. However, the mechanism that ATF5 protein employs in regulating autophagy remains unknown. It was proposed that the ATF5 protein would induce autophagy by activating a protein kinase, mammalian target of rapamycin (a major down regulator of autophagy, in glioblastoma cells. To test this hypothesis, the glioblastoma cells were cultured and then transfected with plasmids to express the ATF5 protein or down regulate ATF5 Protein within glioblastoma cells over a course of 48hrs. If the detector of autophagy, microtubule-associated protein 1 light chain 3 (LC3-II) protein, is elevated when ATF5 is present in a glioblastoma cell lines, then it can be concluded that ATF5 may function as an autophagic up-regulator. Thus, the ATF5 gene can be targeted with pharmaceuticals to inhibit the formation ATF5 activity.

S127 The Effects of a Direct Instruction Flashcard System on Sight Word Recognition with an 18-Year-Old Male with a Learning Disability in a Classroom Setting

**Mary Armstrong, Isabelle Caigoy**

The purpose of this study was to evaluate the effects of Direct Instruction flashcards on sight word recognition with a student with a learning disability in a transitional self-contained special education classroom. Event recording was used to determine the effectiveness of the intervention within a multiple baseline design across four sets of sight words. The Direct Instruction Flashcard strategy consisted of daily drilling sessions lasting five minutes in which the researchers presented the student each flashcard in the drill deck and the student responded. The participant was asked "what word?" and the card was held in position for three seconds before being moved either to the back of the deck or to its respective spot in the deck depending on whether the response was correct or incorrect. If the response was correct, the flashcard was put in the back of the deck and the next flashcard was presented. If an incorrect response occurred, the researcher stated the correct answer and the student repeated the answer and then repeated trials was presented to develop reading mastery. Across all four sets of words, the participant achieved the goal of correctly reading the five words per set for a total of 20 words. The Direct Instruction system was an effective practice that could be continued within the participant's classroom to further develop the number of correctly read sight words.

S128 The Use of Direct Instruction Flashcards with Model, Lead, and Test to Teach Sight Words to a Student with Intellectual Disability

**Khawlah Alkushayban**

The purpose of this study was to evaluate the effects of Direct Instruction Flashcards system with model, lead, and test and rewards system to teach sight words to a fifteen-year-old student with an intellectual disability in a special education self-contained classroom. The participant in this study was a fifteen-year-old boy, in ninth grade who had an intellectual disability and was placed full time in a special education self-contained classroom. A changing criterion design across 15 words of flashcards was implemented to evaluate the effectiveness of the DI flashcard procedures with model, lead, and test. Event recording assessed and quantified the participant's responses. The dependent variable was the number of correct words read. After the pretest was administered, the researcher conducted baseline testing on the sight words. For intervention, the researcher used 15 unknowns and 10 known from the pretest. The flashcards were mixed and the researcher showed each of the flashcards one-by-one to the participant and waited up to 3 seconds per card. If he read the word correctly, then the word was placed at the back of the pile. If he read the word incorrectly then the word was corrected using a Model, Lead, and Test procedure. The results showed an increase of correctly read words. The participant improved his response to the use of 15 DI flashcards during the study. The study could be easily used in other special education classrooms and with an expected succeed.

S129 Tensile Properties of Commercially Pure Titanium After Exposure to Gaseous Hydrogen

**Paul Bickel**

Tensile specimens of commercially pure titanium were exposed to three months of gaseous hydrogen at 1 atm pressure at room temperature and tested to failure in a MTS Criterion tensile test machine. The effect of exposure to gaseous hydrogen is under investigation, as a preliminary step in determining the suitability of using titanium alloys for future hydrogen car components. The initial investigation is to perform baseline testing of the alloy in its as-received condition and compare with specimens that were exposed to hydrogen for three months. The investigation will include heat treatments to determine the effect of heat treatment on properties of the as-received sheet, and properties of hydrogen exposed and then heat treated (outgassed) sheet. Displacement rate effects will be studied in this and in future investigations.

S130 Vision for the Hangman Creek Watershed

**John Chatburn, Amy Hilland, Matt Lower, Martee Snyder, Tim Weber, Coral Wonderly**

Hangman Creek, also known as Latah Creek, covers 689 square miles and stretches from the foothills of the Rocky Mountains, across the Palouse region, to the Spokane River and the Spokane-Rathdrum Aquifer, our primary source of clean drinking water. For the past two decades, Hangman Creek and several of its tributaries have been listed by the Washington State Department of Ecology as "impaired water bodies" for falling below state water quality standards. The main causes for poor water quality are agriculture, urban development, timber removal, channel alterations, floodplain disturbances, erosion and loss of riparian zones. By examining a sub-watershed of Hangman Creek, graduate students from Eastern Washington University's Urban Planning Program have created a proposal for future plans that would support a sustainable future for the Hangman Creek Watershed and its ecosystems. The proposal includes a description of the watershed, a comprehensive stakeholder summary, inventory and analysis that address human and environment-centered concerns, and an assessment of the watershed's strengths, weaknesses, opportunities, and threats.

S131 Measuring Beyond the Mainstream: Ecosystem Services and Economic Viability of the Spokane River

**Heather Ryan, Makenna Sellers, Tyler Kimbrell-Knutson**

This synthesis research aims to explore the correlation between river restoration and the subsequent economic gains to urban areas in the United States. Based on research findings, this poster argues for ecological investment in the sustainable development of hybrid urban-river landscapes by accounting for the ecosystem services a cleaner Spokane River could provide. Drawing from case studies in U.S. cities of comparable population size to Spokane, this study will focus on the changes in urban economic activity after the restoration or relative optimization of environmental goods (i.e. rivers, mountains, and forests). By synthesizing the results of ecological restoration, we plan to extrapolate the impacts of this restoration to the University District in Spokane. Collectively, the project assesses three components: 1) The monetary benefits to businesses resulting from bioremediation and environmental restoration, 2) Key ecosystem services of the Spokane River, and 3) the opportunity to apply the findings from the research paper to the future of the University District.

S132 Examining Differences in the Transition to College, First-Year Seminar Experiences, and Career Maturity Between Traditional, Transfer, and Dual Enrollment Students

**Allison Bigelow, Abby Tomlinson**

Transfer students often have a more difficult transition into their first year of college than traditional students, and dual enrollment students are less likely to attend a four-year university after they graduate. The present research examines the difficulty of the transition into college, the career maturity level, and the perceptions about the usefulness of a new student seminar course for traditional first year students, transfer students, and dual enrollment students. It was hypothesized that traditional first year students would have the least difficult transition to college, dual enrollment students would have less career maturity, and traditional students would perceive first-year seminar as being more beneficial. One hundred and one undergraduate seniors took an online survey measuring their transition to college, their career maturity, and their perceptions on the new student seminar class they took during their first semester of college. The level of difficulty of their transition was measured by combining the Student Adaptation to College Questionnaire and the College Self-Efficacy Inventory. Career Maturity was measured by the Career Maturity Inventory, and student's perceptions of their new student seminar course was gathered through an original questionnaire. There was a significant difference between transfer and dual enrollment student's perceptions of the helpfulness of new student seminar. Dual enrollment students perceived new student seminar to be more helpful than transfer students did. Based on this result, it would be beneficial to conduct further research on what can be changed to help transfer students perceive new student seminar to be more helpful.

S133 The Relationship Between Extracurricular Activities During Youth and Coping Strategies in Adulthood

**Christine Drummond, Kelee Lambert**

Coping strategies developed in adolescence lay an important foundation for future mental health in adulthood. Adolescence is also a time of high involvement in extracurricular activities. However, there is currently little to no evidence linking extracurricular activity involvement and development of coping strategies. This study focused on coping strategy development as reflected through years of extracurricular activity involvement. Participants were grouped into their dominant coping strategy (problem-focused or emotion-focused) using the Ways of Coping Questionnaire (WAYS). The hypothesis of this study was that people who participated in sports during adolescence developed a dominant problem-focused coping strategy more than those involved in fine arts, church-related, or no extracurricular activities. Participants included 189 undergraduate students from Whitworth University (150 females, 39 males) between the ages of 18 and 23 who voluntarily and anonymously took the online survey. There were a total of 113 problem-focused copers and 76 emotion-focused copers. A Chi-Square analysis of dominant coping strategy and extracurricular activities showed that there was no significant relationship between coping strategy and extracurricular activity, suggesting that no particular extracurricular activity was associated with a more dominant coping strategy. This research may benefit society because it examines how different coping skills, developed during adolescence, are gained through certain extracurricular activities. Although no significance was found, this research demonstrates the importance to have both coping strategies because of the various situations people face throughout life. Having a well-rounded index of healthy coping strategies may be beneficial to people when those different stressful situations arise.

S134 Quenching the Oxidation of Pyrogallol by Bromate Using Various Salts

**Forest Dexter**

The oxidation of pyrogallol by bromate is an oscillating reaction known for alternating from an orange to a yellow color. Oscillating reactions can be models for the biochemical reactions resulting in bipolar disorder. Quenching the oscillations and stabilizing the reaction was achieved by adding various salts into this reaction. The reaction was monitored using both redox potential and visible spectroscopic probe absorbance between 750 to 1150 nm. The redox potential stabilized at 800nm when oscillations stopped. Out of the 22 organic and inorganic salts that were added, 2 were not successful at quenching the oscillations, sodium iodate and lithium carbonate.

S135 Stabilizing PepX L. helveticus through the Introduction of Disulfide Bonds

**Sarah Hill**

Celiac disease is an autoimmune disorder that causes an immune response in the presence of dietary gluten which destroys the small intestine. One of the main components of gluten is gliadin, a proline rich protein which the body has difficulty degrading into peptides. The exopeptidase PepX L. helveticus (PepX LH) is excellent at degrading gliadin, when combined with other peptidases, and is therefore being considered as a potential therapy for the treatment of celiac disease. However, the wild type enzyme is quickly degraded by pepsin under physiological conditions. Since disulfide bonds are known to help stabilize enzymes and assist in the maintenance of tertiary structure, the introduction of disulfide bridges is expected to create a pepsin resistant enzyme. Cysteine mutations have been introduced to the enzyme through site-directed mutagenesis to create a potentially stabilizing bridge in different locations. The presence of disulfide bonds and any stabilizing effects for each mutant is unknown but under ongoing investigation.

S136 Analysis of GPS locations for elk based on radio collar data for two differing collar types

**Christina Winters**

Approximately 200 elk were randomly outfitted with one of two different radio collars: Lotek or Vectronics by the Idaho Department of Fish and Game and then released to collect data for three years. Before answering large picture pattern questions with the data from the radio collars, the quality of data needed to be assessed so the main focus of this project has been assessment of data quality and potential bias based on collar type. In order to determine the data quality, the data was separated into collar type and then analyzed independently. For each of the two collar types, the fix rate was determined and the year of the collar was noted. For each collar type and year grouping, the average geometric dilution of precision was calculated for the successful fixes, temporarily setting aside unsuccessful fixes for this specific analysis. Using the average GDOP for each collar type and year grouping, this was then compared to the fix rate for each collar based on

type and year. Along with this, the proportion of 3-D fixes was plotted against the unsuccessful fixes for each collar type to determine potential bias between collar types. To further analyze the potential bias, the collar data was also analyzed according to seasonal groupings to determine the effect seasonality has on data quality in terms of GDOP and successful fix rates.

S137 Synthesis, Purification and Characterization of fac-[Re(CO)<sub>3</sub>(Cl<sub>2</sub>phen)]<sup>+</sup> and fac-[Re(CO)<sub>3</sub>((NH<sub>3</sub>)<sub>2</sub>phen)]<sup>3+</sup> Complexes for Biological Imaging Applications

**Kateryna Kostenkova**

Rhenium is able to form complexes with a variety of polypyridine ligands, such as 1,10-phenanthroline, and its derivatives. These complexes can have multiple potential applications, including the alternative energy sources and compounds for biological imaging. The goal of the research project was to synthesize, characterize and purify rhenium(I) complexes, fac-[Re(CO)<sub>3</sub>(Cl<sub>2</sub>phen)]<sup>+</sup> and fac-[Re(CO)<sub>3</sub>((NH<sub>3</sub>)<sub>2</sub>phen)]<sup>3+</sup>. The complexes were characterized by <sup>1</sup>H NMR, <sup>13</sup>C NMR, FT-IR and fluorescence. Influence of electron withdrawing/donating substituents (Cl, NH<sub>2</sub>, NH<sub>3</sub><sup>+</sup>, OCH<sub>3</sub>) on the polypyridine ligands on fluorescence properties was observed. When excited at 330nm, fluorescence of the complexes due to ligand-ligand charge transfer was sensitive to substituents on the phenanthroline ligand. When excited at 420nm, fluorescence due to metal-ligand charge transfer was pH sensitive and sensitive to substituents on the phenanthroline ligand.

S138 Quenching the Manganese Catalyzed Belousov-Zhabotinsky Reaction

**Kaitlyn Hahn**

The Belousov-Zhabotinsky reaction using a manganese catalyst was studied. It is thought that a better understanding of quenching oscillating reactions could help comprehend the reactions that occur in the brains of individuals with bipolar disorder. Salts solutions were tested to find characteristics of successful, quenching compounds, or compounds that could stop the oscillation reaction. During data collection the reaction was allowed to oscillate for ten minutes and then a salt was added in increasing volumes and concentrations to measure salt quenching effectiveness. Redox potentials were measured as well as UV-vis absorbance in order to monitor the oscillations or quenching that occurred. Out of the 20 salts attempted, only three, Li<sub>2</sub>SO<sub>4</sub>, K<sub>2</sub>SO<sub>4</sub>, and NaIO<sub>3</sub> did not successfully quench the reaction. The connection between pKa values, redox potentials, and quenching abilities were also examined.

S139 The Effect of a Token Economy on Decreasing Talk outs for a Student

**Amy Hansen, Catherine Martin**

The purpose of this study was to evaluate the effects of a Token Economy on decreasing the number of talk outs of two 14-year-old middle school students in a self-contained classroom. One participant had an intellectual disability and the other had ADHD. Both displayed high rates of talk outs that disrupted the classroom and prevented them from learning. The researchers used an event recording data collection system to add the number of inappropriate talk outs during a 10-minute session. A reversal design was implemented with the format of ABAB to analyze the effects of the Token Economy. For intervention, the Token Economy system began with a check in with each participant and told them the goal target number of talk outs to be under for that session. Then after class begun, the researchers started the 10 minutes and began recording each talk out per participant. To earn a star, the number of talk outs in the session had to be less than the goal number of talk outs specified at the beginning of the session. For every three stars earned the participant had a choice to exchange his stars for one of five preferred items. If the session goal was not met the participant did not earn a star. For both participant's high rates of talk outs occurred during baseline and near zero levels happened during intervention. The Token Economy intervention proved to be extremely successful and a practical intervention for the classroom setting.

S140 The Effects of Model-Lead-Test with DI Flashcards on a 17-year-old boy with Intellectual Disabilities

**Teresa Jensen**

The purpose of this study was to determine the effectiveness of Direct Instruction flashcards using Model-Lead-Test on sight-word identification for one student with Intellectual Disabilities in a special education resource room. A changing criterion design was used to build the overall number of correctly read words. The DI Flashcard system used a combination of known and unknown sight words to provide word discrimination. Teaching included the researcher modeling the correct word, then saying the word with the participant as a lead, and then testing the participant's independent response. The results of the DI flashcard system indicated that it was effective in increasing acquisition, accuracy, fluency, and retention of previously un-mastered sight words. Procedures for both the intervention and data collection was practical to implement and easy to fit into the classroom schedule.

S141 An Evaluation of Alternative Construction Techniques for Affordable Housing

**Mariano Laguna, Angela Lanning, Kassandra Zohn, Nathan Foster**

Affordable housing plays an important role in providing equal opportunity for individuals to achieve success within communities in the United States. The research being presented focuses on the construction of affordable housing projects located in the greater Spokane area. The results of this research include an encompassing understanding of the current construction practices as well as an evaluation of alternative approaches to building successful affordable housing. The focus on the construction techniques is for a single-family, one story unit. Information presented will include a decision matrix comparing the costs associated with current construction techniques to alternative techniques. Construction factors being looked into while generating the decision matrix include: an analysis of Spokane soil bearing pressure, constructability of building materials, availability of materials, and costs associated with each technique (both labor and material). The decision matrix used to present this research is separated such that wall and foundation techniques are analyzed separately. Wall systems being analyzed include conventional wood frames, optimum value engineering wood frames, structural insulated panels, insulated concrete forms, and straw bale walls. Foundation systems being evaluated include shallow foundations, pole design, raft

foundations, and pile foundations. This information will prove to be vital for reducing construction costs associated with affordable housing projects.

S142 Effect of Gate Location on Injection Molded Acrylonitrile Butadiene Styrene (ABS) Tensile Bars

**Bryan Erich Yu**

The gate location is a critical decision in injection molded parts. The correct gate location (and size) affects properties, as well as time-to-mold, cost and materials required. Other factors which affect properties include injection molding temperature and pressure. The current investigation is based on a systematic study of the tensile strength of acrylonitrile butadiene (ABS) tensile bars that were injected using three gating's. One of the gating's involved injecting ABS through a center gate, in the gage section of the bar. The next gating involved two gates, one on each end of the bar. The last gating is one directly in the center of the bar. The effect of gate location for this material will be preliminarily discussed based on experimental data. Future investigations may include bars that were molded under a range of temperature and pressure conditions, as well as a study of other materials.

S143 Relaxation of Injection-Molded ABS

**Cesar Ortiz Rios, Andrew D'Alba, Patrick Tjandra, Everett Fellger**

Acrylonitrile Butadiene Styrene (ABS) is a commonly used thermoplastic polymer. Its applications range from household and consumer goods, specialized medical devices, and, more recently, extrusion filament for 3D printers. Use of ABS has increased steadily over the years and is expected to continue. This research is for the characterization of the relaxation modulus of injection molded ABS. Variables studied in this research project include strain rate, ethanol vapor exposure, and ethanol immersion. The ethanol exposed samples are an attempt to study the effect of deterioration resulting from environmental conditions on mechanical properties. Also considered in this study is the resultant effect of using discrete relaxation tests instead of a continuous test. A discrete test is one where a sample is pulled to a desired strain, followed by a new sample pulled to a higher strain, and repeated until higher strain is no longer achievable. Continuous tests strain a single sample to failure. These two types of relaxation tests are expected to yield different results. This effect is used to approximate the true relaxation modulus of ethanol immersed ABS under the assumption that continuous tests last longer than it takes for ethanol to evaporate. This research will advance collective understanding of material relaxation, relaxation testing, and deterioration effects on material properties.

S134 Selfie-Image

**Anna Lague**

This purpose of this research is to discover how individuals construct their self-image based on their interaction with the Snapchat application. Digital intimacy is the measure that this research is specifically looking to explore and how immediacy of response, acknowledgement of posted material, and self-exposure impact the way individuals come to view themselves. This research will explore the context collapse that may or may not occur in the utilization of the Snapchat application, and how relational meaning can be inferred from the way individuals and others choose to interact with the application. This research focuses on the different factors that people use to construct self-image. Additionally, there will be a focus on the way individuals create meaning from Snapchat and whether or not there are unofficial categories of the types of snapchats that are sent. There will be a strong emphasis in this research on whether or not individuals feel relational maintenance for relationships that occur in the physical world can be administered through the Snapchat application. Along this same line there is inquiry into the digital intimacy individuals direct through snapchat and whether or not this has a serious effect on self-perception. This study utilizes secondary research in order to synthesize information gathered from in-depth interviews and focus groups that determined the emotional responses and ties individuals have to the Snapchat application.



## Oral Presentations

### OA1 Behind Bars: The Capitalistic Struggle in Orange is the New Black

**Kailee Haong**

Capitalism is alive and thriving in Netflix's Orange is the New Black series. A Marxist analysis of Season Three uncovers the plight of the protagonist, Piper Chapman, and her ascent through the capitalistic hierarchy that is present behind bars at the Litchfield Penitentiary. Capitalism produces two distinct binaries: the proletariat, and the bourgeoisie which both take form on screen. Upon entering Litchfield, Piper can be seen as a part of the proletariat, working for nothing, contributing to the great overall mechanism of capitalism. However, throughout the season, Piper gains cultural capital, starting an illicit side business and making a profit off her workers. In this shift, Piper ascends the hierarchy and finds a comfortable seat among the bourgeoisie with her hardly paid employees vying below her for a chance at underpaid work. Through commodification of underwear and a secret underground sales campaign, the soiled underwear of her inmates becomes of incredible exchange value. Through Piper's reign, she begins to create a capitalistic society within the overarching capitalistic society of the prison. As Piper gains momentum and cultural capital, false consciousness acts almost like a drug, deluding her from the fact that she is still an inmate in prison. Though Marxists would criticize the ways in which commodities and money are valued over human lives, they would also applaud the creators of the series, as they position the show in a way that forces viewers to be both aware and critical of capitalistic society.

### OA2 Diminishing Female Sexuality: The Issue of Heterosexual Pornography

**Kailey Rice**

In an increasingly technologically driven society, access to sexually explicit content is progressively available and accessed. Thus the pornography industry has become an extremely powerful entity, which capitalizes off of portrayal of sexual imagery and videos. Fairly, one can assume it to be an entirely relevant and integral part of the 21st century. Yet, its work indicates strong ties to patriarchal rule, therefore limiting pornography to valuing only men, and limiting the role of women. While the industry itself is up for debate in its treatment of women, this essay focuses on the ways in which pornography is limited for the female viewer. Through Laura Mulvey's claim that women are valued for their "to-be-looked-at-ness" within cinema, it is claimed that pornography follows suit. Typical heterosexual pornography is limited for the female viewer because it asks her to embody the man (a problem for any woman) and view the woman as her object of desire (an issue for women whose sexual object is not another woman). This problem is bigger than the pornography industry, as society places exchange value on men in areas such as film and advertisements. Thus, women are left behind in almost every example of visual representation, including pornography. Moreover, studies indicating that the majority of female viewers of pornography choose to watch lesbian images and movies, articulates where the industry needs to change. Focus on male orgasm in heterosexual pornography ignores any female audience. Thus in honoring female orgasm, the pornography industry will begin to value women.

### OA3 A Feminist Interpretation of Hamilton: An American Musical

**Sarah Ghods**

Hamilton: An American Musical is the production that took Broadway by storm in 2015 and that fully embodied the American dream for men. Although America is a country that was founded by men, this musical shows that these founding fathers, specifically Alexander Hamilton, would be nothing without the women who helped shape their lives and values. By focusing on the three women present in the musical Lin Manuel Miranda, writer and star of the original production, challenges what it meant to be a woman in 18th century early America and what we as viewers of the 21st century can take away from the play.

### OB1 Breaking Down the Athlete: Acting on Compassion

**Caitlyn Heredia**

People tend to view elite athletes solely as a form of entertainment. Other aspects of an athlete are overlooked, even when it comes to the medical staff providing care. The Professional Baseball Athletic Trainers Society gave me the unique opportunity to provide medical aid to baseball players at the Mariner's Spring Training Complex in June. I gained knowledge of the Athletic Training staff's rehabilitation philosophy, but more importantly learned how to act on my compassion with these elite athletes. I observed how the staff treated these athletes as ordinary people, and it occurred to me these athletes desired to feel important. After placed on injured reserve, some players have their mental toughness stretched, and begin to feel their identity as an athlete becomes diminished. Providing support, not just physically, externally and internally helped improve the progressions of some of these athletes through their exercise programs. The simplest way to support was showing a willingness to help an athlete through an exercise from their program. This is often the first step to gaining a strong patient rapport. When that rapport was beginning to form, it internally motivated me to continue to enact my compassion. From providing that support, I was able to break through with a handful of athletes. This experience taught me the importance of utilizing compassion as a clinician. Athletes are more than the revenue they gain. Conventionally they possess a higher status, but they can be kind and caring, and desire to be treated as a normal person.

### OB2 Perceptions of International Anti-Doping Policy in Collegiate Coaches

**Siena Morgan**

Athletes that consider making the transition from college sport to international competition must also transition in the understanding of, and adherence to anti-doping policies. Simply learning these policies after college is a tremendous undertaking. For athletes interested in participating at an Olympic level, the learning process of doping policies begins in college. Coaches serve as the primary source of education to elite athletes as well as the support system for these athletes and anti-doping policies (USADA, 2016). This research sought to understand coach perceptions of international anti-doping policy in order to identify and further understand any gaps that lay within the

general framework of current anti-doping policy. Assuming a structure in grounded theory, interviews were conducted with collegiate coaches representing some of the aforementioned sports. These interviews exposed several themes including, the role of athletic trainers, sport-specific applicability, and education. For some coaches the lack of sport-specific applicability, that is, a lack of positive drug tests within their sport, led to decreased awareness of certain aspects of policy. Coaches also revealed that a strong relationship between coaching and medical staff was crucial to a successfully compliant program. Overall, the overlap in levels of competition were found to be dealt with by the relevant governing body individually, and where applicable. Avenues for future research could include: the study of the perceptions of coaches of National Governing Bodies (NGBs), as well as a study of the perceptions of athletic trainers at both the collegiate and Olympic levels.

OB3 Career and educational experiences of high school athletic directors: A multi-level perspective

**Jesse Croskrey**

High school athletic directors (ADs) play a crucial role in the administration of high school athletic departments (Schneider & Stier, 2001; Stier & Schneider, 2000). With more than 7.7 million high school student athletes (NFHS, 2015a), ADs have more responsibility than ever before when managing an athletic program. Duties include, but are not limited to student-athlete development, transportation, technology, legal and safety concerns, and marketing and fund-raising. High school principals are finding the hiring of ADs more challenging with these increased responsibilities. The purpose of this study was to determine what career and educational experiences high school principals look for in an AD, then to see if current ADs have these experiences. Overall, 112 principals were surveyed and 37 ADs submitted their resumes for comparison. Results showed that principals preferred ADs to have coursework background in Law, Ethics, and Budget and Finance. Principals rated experience as a head coach the highest among professional experiences and results showed that 72.9% of ADs had such experience. The results of this study will benefit high school principals and AD alike. Those looking to become ADs can shape their career path to meet the needs of principals and take specific action to gain the necessary experience. Principals will be able to use the results to ensure they focus on the criteria being used by other hiring professionals when the time comes to find a new AD.

OB4 Prevalence of problem gambling habits in student-athletes at religious institutions

**Brian Fowler**

Pathological gambling, and its less severe counterpart problem gambling, are defined by the American Psychiatric Association as gambling behaviors that disrupt personal, family, and vocational pursuits (Rockey, Beason, & Gilbert, 2002). In the last 40 years these two issues have grown from effecting 1.1 million people to now impacting between 4 and 6 million (Lesieur & Blume, 1987; Reuter, 2015). Previous research shows that this high rate of gambling is even more apparent on college campuses among student-athletes (Sullivan-Kerber, 2005). The current study looks to extend the previous research by investigating prevalence rates of pathological and problem gambling among club sport student-athletes at religious universities. Participants in the current study included 282 students who participate in various intercollegiate club sports at four different religious universities. The South Oaks Gambling Screen (SOGS), a reliable and credible tool for measuring pathological and problem gambling, was used as the testing instrument. Results indicated the prevalence rate of pathological gamblers to be 4.4%, while the rate of problem gambling was 12.2%. Concerning gender, 18.1% of males and 14.3% females surveyed exhibited probable pathological and problem gambling habits. Finally, only 63 of the student-athletes surveyed indicated that they had any knowledge of university policies or resources concerning gambling. These findings demonstrate that religious universities are not immune to the gambling issues that affect college campuses and student-athletes. Furthermore, the insight and awareness into the gambling issues that is provided allows college administrators to better understand and begin to address the problem.

OC1 Biggest Fears, Smallest Screen Time - women of color in horror films

**Grace Nakahara**

As an Asian American woman who loves horror films, I want to talk about how I am represented in my favorite genre. What subliminal messages are being pushed upon us by the film industry about how we as a society should view WOC? Why aren't we seeing more women of color as the protagonists in the genre? Minorities in general are under-represented in horror films. Historically, white men are given recognition as the best friend or the first victim. White women are given a sliver of protagonist roles. Minorities are given minor roles, and this hierarchy of characters affects the audience's understandings of race in real life. The Center for the Study of Women in Television and Film's released a study showing that "only 12% of all clearly identifiable protagonists were female in 2014." And even in those already low numbers, they were predominantly white, 11% being black, 4% Latina, 3% Asian and 4% other. We live in a world where it is more likely to have an alien female lead than an Asian one. This Paper is going to address why horror films are afraid to give WOC real character development, choosing instead to demonize them or kill them off? Looking into films like *The Descent* (2005), *Ginger Snaps* (2000), *Ringu* (1998), *Shutter* (2004) and much more, to explore why the issues of racism and sexism are kept separate? Why is fear associated so strongly with the fetishization of entire races? What do audiences internalize from this? And why do I need blonde hair to be liked?

OC2 A Little Bump & Grind: Sex & Sexuality in Horror Films

**Gabriel Rivas**

What scares you? Is it physical or psychological? Fantastical or Grounded? Questions like these are the backbone of the horror film genre and yet for almost one hundred years, an issue has permeated this genre. Since the foundation of horror movies in 1920, films like *Nosferatu* have portrayed women as weak, inferior, sexualized objects to either be rescued by a man, attacked by one, or a creature symbolic of our greatest fears. In the following decades, the Horror genre underwent significant shifts with regards to the types of Horror films being shown on screen but ultimately the same elements remained. Throughout the 1930s marked the Universal Monster Age of Horror with films like *Wolfman*, *The Mummy*, and *The Invisible Man* all debuting. The 1950s-60s saw films like *Peeping Tom* tackle the effects of sexuality from a psychological perspective, as well as films from the Hammer Film Productions which revisited classic monster

movies like Dracula, Frankenstein, and The Mummy. In a paper entitled "Screens on Screens: Paradigms of Horror" by Barry Grant, a professor at Brock University in Ontario, Canada, notes that The Hammer horror films revitalized the genre by reinterpreting as well as updating its traditional gothic iconography with a bold use of colour and a modern dose of sexual content, including liberal attention to breasts and buttocks (2). Moving forward, 1970s-80s, popularized the "slasher" with heavyweights like Halloween, Friday the 13th, and A Nightmare on Elms Street attaining cult status. When analyzing such films, the goal of my presentation will be to demonstrate how although each era of Horror films added a new element, in the end, sex and sexuality remained a constant throughout this genre's entire history. Thus, even modern films today revert to using old tropes and only in rare instances do we see the actual progression of how women are portrayed. I would also note that the constant portrayal of women in this manner has led to a plethora of stereotypes regarding women not only within the horror genre itself, but also within current society. By looking at research and analysis conducted relating to this field, by Professors like Barry Grant and others, I will attempt to show the evolutions within horror films but also how in all that time, the portrayal of women has ultimately remained the same.

OC3 How Do We Know What We Know We Don't Want to Know? Gadamerian Hermeneutics and the Horror Film

**Ali Rushevics**

Studies surrounding the horror film often focus on questions of why we, as a society, produce and consume this genre, particularly disturbing in nature. An interesting theme throughout most of the genre is the breaking down of social constructs. A critical way to engage in watching horror films is through the lens of the Gadamerian Theory of Interpretation. Hans-Georg Gadamer is a contemporary Continental philosopher from Germany, most famous for his work in Hermeneutics, a branch of knowledge dealing with interpretation. This paper connects Gadamer's notion of the Horizon of Understanding to the experience of watching a horror film. It explores the idea of encountering the horror film with the potentiality for a transcendence of knowledge. Horror films often present to the audience something that completely turns our current understanding of reality upside down, which is a difficult, disturbing, and troubling experience. Yet, in doing so, horror films often unveil the illusions of our ordered world. By viewing horror films through a lens of the Gadamerian Theory of Interpretation we are able to begin productive conversations toward the unveiling of socially constructed illusions encouraging sociopolitical change and progress. This paper will focus on three distinct social constructs, through the presented lens, which we encounter in horror films: gender binaries, as seen through movies such as Alien and The Exorcist; the knowable/sensible world, seen through movies such as The Descent and Nosferatu; and definitions of abuse, seen through movies such as Peeping Tom and Repulsion.;

OC4 Feeding the Monster of Our Imagination

**Riana Slyter**

Horror movies have been popular for their enticing stimulation of fear. By examining how tropes of horror have evolved to account for an audience conscious of the conventions of fear it will result in revealing and reflecting our societies values, attitudes and beliefs. Audiences today have been desensitized to the common horror tropes and have now become cliché. These tropes include Body Horror, the Uncanny Valley, and the Jump Scare. For example, some jump scares come off incredibly forced, overused and predictable like in the movie The Evil Dead, but in the Conjuring years later, one is able to anticipate the jump scares. However, they do not follow the same formula, The Conjuring Jump Scares anticipate what the viewer is thinking and places the terrifying image and loud noise at different area and moment of the film. Horror movie masters, like Alfred Hitchcock, created timeless stories of horror, through the reoccurrence of these tropes. However, modern day viewers would not identify his movies as particularly terrifying. These older horror movies use primitive, universal fears that conjure up how we feel about the dark, monsters and loneliness by evoking these emotions from the unconscious depths of our minds. The difference in these films is how the director has represented these themes on screen. The themes of horror that scared us a generation ago still scare us to this day, but they must be represented differently in film to keep the audience interested. Movies that we find horrifying include ones that are considered correctly manipulating the components of suspense while challenging the predetermined boundaries of the world around us and who we are as humans.

OD1 Are We Really All in this Together? Race and Gender in the High School Musical Trilogy

**Macy Conant**

High School Musical was a franchise of movies that took the world by storm in the early 2000s. However, these movies which were targeted at younger kids and teenagers have more issues with them than what appears at first glance. A closer look into the development of each character over the course of the three movies proves the gender stereotypes as well as the racial stereotypes which play out in the films can be damaging to the audience and how they perceive the world. While the movies have a moral quality to them as they teach kids to pursue their dreams whether or not they are considered "cool," the deeper meaning behind each character's actions and portrayal show a much bigger problem that can effect kids for years to come. This project takes a closer look at how each of the main characters buy into stereotypes, both about their gender and their race.

OD2 Jon Stewart, Stephen Colbert, and the changing political conversation in America

**Kurt Wohlers**

My goal with this presentation will be to better understand how Jon Stewart's The Daily Show and Stephen Colbert's The Colbert Report changed the face of news media and the place for satire in American entertainment. Moreover, to also look at who Stewart and Colbert stood for, oftentimes people who felt disenfranchised during the Bush years. The early 2000's were dominated by a strong conservative government in America and Fox News seemed to be controlling political media. They spoke for those who felt alienated by the logic being put forth by major institutions at that time. Among these were broadcast media, and Stewart's show was all about keeping broadcast media honest, about examining contradictions in what was being said in government and articulating what mass media often couldn't. Colbert mocked those contradictions by incorporating them into the nature of the show itself. Perhaps most importantly of all, both shows

underwent serious changes. Trever Noah and Larry Wilmore taking over for Stewart and Colbert, respectively. This I will argue marks a significant change in the politics of the nation as both administrations as well as American discourse were changing.

OD3 Legally Blonde: Female empowerment or perpetuation of female stereotypes?

**Morgan Smith**

The film Legally blonde is often championed as a film that represents feminist ideals in academia. As a part of a panel discussion on "Gender, Race and Politics in Popular Culture" this presentation will explore whether Elle Woods achievements in Law School actually act as a source of empowerment for woman in academia or if it reinforces gendered expectations that are present in popular culture today.

OD4 The Dark Knight and Myth: the Archetype Gotham deserves and we need

**Joshua Jacobs**

Certain mythic themes appear, disappear, and reappear in popular culture. Myth provides an arena for people to receive closure and to deal with greater dilemmas that seem too monolithic to be digested. One example is the mythic hero, Batman whose experiences with trauma and loss, and his commitment to social justice have resonated with American audiences. Yet since Batman's first appearance in 1966, the character has undergone significant revision: he no longer wears tights, but Kevlar armor; the bat mobile is now more reminiscent of a tank than a car and Robin is no longer in the picture. If we imagine our superheroes in our image, then what do these changes to Batman say about the twenty first century struggle? This paper explores Batman's character as a mythical, archetypal hero, and brings to light the psychological implications and socio-cultural context in which Batman has begun to re-emerge and flourish on the big screen

OE1 "I Know What Kind of Man You Are": Constructing Masculinity in Spenser's The Faerie Queene and Tennyson's Idylls of the King

**Julie Henling**

Written in 1596, Edmund Spenser's The Faerie Queene features Arthur before he becomes king. Uncrowned, lustful and young, Spenser's Arthur saves the day many times throughout the story. Almost three centuries later, Alfred Lord Tennyson featured the classic British figure as the protagonist in his story. But instead of merely copying Spenser's character, Tennyson chose to make his king as different as possible from his predecessor. Scholars have recognized this fact and generally agreed that there are little to no similarities between the two men. In fact, the editors of the 1932 Spenser Variorum, a comprehensive guide to the works of the poet, claimed, Tennyson's Arthur differs in almost every essential respect from Spenser's (as cited in Held, 2016, p. 41). Very few modern scholars have been interested in arguing this statement, which is unfortunate. While it would be totally ignorant not to accept the obvious differences between the Arthurs, a closer examination of both stories reveals their surprising similarities. Furthermore, these similarities show how both texts help form the definition of "masculinity" as used today.

OE2 The Shadow of Eve and How It Impacts Una in the Faerie Queen

**Madison Schreiter**

Throughout the Faerie Queene, Una is intended to be the perfect example of a loyal, pure woman wrongfully mistaken for a deceitful woman. Edmund Spenser in book one of the Faerie Queene presents Redcrosse's abandonment of Una after he is tricked by an illusion as an allegorical example of the Faith being tricked into abandoning the True Church. The problem with the dual nature of the characters in the poem, real and allegorical, is that Una has more than just those two identities because she is female. As a woman in a work of Renaissance literature, Una carries the potential to be either a pure woman or a sexually false, corrupting woman. Even as Una remains pure and loyal to Redcrosse, her identity as a woman forces her to constantly prove her loyalty because men will always expect women to be false. In the Faerie Queene Una's parents lose their kingdom Eden to a dragon, which implies that Una is the child of Adam and Eve. The origins and justification for men thinking women are deceitful and sexually manipulative is Eve. Adam was led astray by Eve. To any man writing Renaissance literature every woman has the potential to corrupt male protagonists and Una is no exception to this rule. Una as a fallen woman carrying the burden of Eve's mistake can never be the true allegorical symbol Spenser constructed her to be. Instead her symbolic potential becomes fragmented by the legacy of Eve and her ability to be the true church is corrupted by the Renaissance attitudes towards women.

OE3 Servicing Men: Feminine Sexuality in Spenser's The Faerie Queene

**Teresa Yandl**

The famous philosopher Simone de Beauvoir once noted the phenomenon of gender perceptions in society and, specifically, the portrayal of the male being and the female other. Literature often shows this relationship by using female sexuality as a tool to explain the male conditions of temptation, resistance, and inner strength without ever examining the woman's perspective. Edmund Spenser's epic poem The Faerie Queene is a prime example of this masculine narrative. Spenser creates a dichotomy of female sexuality that divides women into two polarized archetypes that serve to balance each other in their opposition. This trope, which plays itself out throughout Early Modern literature and into modern media, portrays women as either pure and virginal Madonna figures or sexually promiscuous and wicked Whores of Babylon. By shoe-horning women almost exclusively into these two roles, Early Modern writers such as Spenser could more deeply examine the elements of good and evil that affect the male psyche. Good and evil, in this case, are based on Early Modern Christianity and the distinct separation of spiritual and physical. These teachings, and others, serve as the foundation that Spenser builds off of to establish the trials of temptation and redemption for his male character, Red Crosse. Spenser's creation of the dichotomy between the Madonna and the Whore in order to emphasize his masculine narrative perpetuated a culture of shame that still affects the portrayal of female sexuality in literature and media today.

OF1 Marvell the Heterosexual

**Kendall Clark**

The identity of heterosexual emerged as an aspect of modernity and, therefore, cannot be considered an aspect of Renaissance life. During this time period, having sex with a person of the same sex was considered sinful, but was not categorized as homosexuality, thus its opposite heterosexuality did not exist. Although wide repression of sexual desire was practiced during this time period, poet Andrew Marvell possessed the ability to separate himself from religion in order to write poetry that was free of religious convictions. In doing so, Marvell's works are identifiably closer to modern heterosexuality in that they portray the fully formed sexual desirous man. Consequently, Marvell had to create characters through his writing that are divorced from his intensely religious public persona. His alignment with the Cavaliers parallel misogynistic ideals of many poets of his time, but his masculine elements go much deeper in his poetry and make him appear more modernly heterosexual. In addition, Marvell utilized the pastoral poem in order to advance the idea of religious freedom, instead of following the pastoral theme of romanticizing rural life. Andrew Marvell's transcendence of the power of religion in his time granted him the capability to establish himself as a distinct poet of the Renaissance Era.

OF2 The Phallocentric Nature of the Renaissance

**Vincent Andrew Lopez**

Notable authors Robert Herrick and John Milton thrived during the Renaissance and have been praised for their literary contributions. This paper seeks to dissect the underlying influences of their work, namely their perspectives on gender and sexuality. The point of this goal is to discover the overall attitude narratives held against women during the Renaissance. The results of these analyses expose the unabashed sexism that fuels the portrayal of the women present in their works, particularly Herrick's poem "Delight in Disorder," and Milton's epic poem Paradise Lost. An explication of each poem and their key sections is the primary method of understanding the intentions held by Herrick and Milton. The work done by William Kerrigan and Gordon Graden in their book, "The Idea of the Renaissance," coupled with the analysis of Herrick's "Delight in Disorder" offered by Robert H. Deming in his article "Robert Herrick's Classical Ceremony," show that one can see how the authors work with and perpetuate the narratives of the time, effectively rendering their works true representations of the dominating patriarchy. This paper wonders how and why the dominating patriarchy exists in the language upon which the literature is reflected. The answer to both questions comes through the subjugation of women so as to exemplify and undermine their roles in society. Seeing as both authors have received timeless approval for their contributions, the sexist nature of their writing has survived because of phallocentrism. In other words, the writings are structured to privilege the masculinity of the males.

OF3 Gender and Spirituality in Health Care Chaplaincy

**Jessica Hoogerhyde**

Chaplains in health care are entrusted to care for patients as whole persons - body, mind and spirit. Healing is not just a biological process. It also involves a positive or negative attitude toward the body and our gendered existence as well as our capacity to be spiritually sensitive. This paper will explore how spirituality impacts our health, how it can positively or negatively affect our healing, and how males and females perceive the impact of spirituality in relationship to their bodies. It will attempt to answer the question as to whether or not one gender places a higher importance on spirituality, and is more concerned with spiritual health than the other. Are females more receptive to spirituality than males? Are there obstacles for males and females to allow spiritual sensitivity to make a positive impact on a healing process? What are they? Are the same or different? The responses to these questions will be based on interviews of health care chaplains or writings related to chaplaincy in health care.

OG1 Misuse of Terrorism Prosecution & The International Community: The Implications of Human Rights & the Power of State Sovereignty

**Nicole Kallestad**

The implementation of counter-terrorist legislation within the laws of sovereign states has become a matter of global concern. While counter-terrorist legislation is viewed as a necessity to ensure both national as well as international security, the methods of its application have recently undergone scrutiny. Misuse of terrorism prosecution can create circumstances in which human rights abuses occur, weakening the rule of law within the state and undermining state legitimacy in the eyes of the international community. The application of counter-terrorism laws has led to an international discussion of what terrorism truly means and which acts fall within the scope of its definition. Is it a violation of international law for states to prosecute on the basis of terror, acts not considered terrorism by the international community? It proves useful to explore the experience of other nations in achieving the delicate balance that is needed in protecting human rights and preserving national security (Kumar, 2005). In light of Chile's struggle to define how anti-terrorism laws shall be utilized to prosecute criminal offenses, I will examine India's legislation concerning counter-terrorism laws as a case study to analyze how the Chilean judicial system could better safeguard national security and uphold principles of human rights through fair trial and due process. When the rights of the individual are endangered, it becomes the obligation of the state to ensure that its measures to secure stability allow for the recognition of human rights while accomplishing the goal of maintaining national security.

OG2 Discrimination in the United States Political Asylum Process

**Peter Schoening**

The opportunity to gain permanent solace in the United States is desirable for millions of refugees from around the world, especially for those who originate from Central America. However, according to several sources, the United States rejects most applications of asylum-seekers from Central America.; The disparity between acceptance of Central Americans and other countries leads me to believe that the United States discriminates against asylum-seekers based on national identity. In order to determine whether or not the United States is holding to its international obligations to provide aid in the worldwide refugee crisis, I will answer the following question: Does the United States political asylum process discriminate against refugees on the basis of their national identity to the extent that the United States

violates international law?; I hypothesize that the United States is preferential in granting political asylum on the basis of national identity, which violates international obligations and humanitarian rights under principles of international law. In order to reveal the truth in this claim, I will provide a general definition of political asylum, according to international agreements, norms, and policies. Next, I will describe what is specific to the United States in regard to the political asylum process and its laws, noting case precedent that has significantly impacted the political asylum policies of the United States. I will then examine cases and articles that help answer my research question. Lastly, I will offer predictions and advice for the future discourse of political asylum in relation to international law.

OG3 Should Female Genital Mutilation Be Classified as Torture?

**Karen Fierro**

When over 200 million women and children are subjected to the act of female genital mutilation, where do laws stand on defending their rights to live a life under their own control? This original research investigates whether Female Genital Mutilation (FGM) is classified as torture under international law and therefore qualify under jus cogens as a violation of human rights. A universal acknowledgment of FGM as jus cogens would permit victims of this practice to bring suits against those who have performed the action without consent in all courts subject to international law. FGM, according to the human rights argument, neglects the victim the right to be free from all forms of discrimination, the right to life and physical integrity, including freedom from violence, the right to health, and the right of the child. However, some argue the practice is closely related to religious and cultural practices. The clear prohibition of such cultural traditions leads to questions regarding the power of law relating to sovereignty.; Citing the customs and treaties that have passed on the subject of FGM in international law, the interpretation of FGM as torture can be found in numerous declarations for the protection of the rights of women and children. This approach seeks to interpret not only such existing international declarations but also the absence of language in international law. Permitting the classification of jus cogens to the act of FGM provides this generation with a clear and founded argument towards the eradication of gender-based violence.

OG4 A Legal Perspective on American Rights, Responsibilities, and Shortcomings with Man's Most Precious Resource: Water

**Matthew Evans**

For the most part, life and civilization has followed the path that water takes it. Access to clean water has, and will likely always be indicative of standards of living. America is no exception to this correlation, with a varying degree of access to and quality of water. For the most part, international standards for water cleanliness have risen out of the increasingly politically-globalized world. Though one might assume that the United States, being a strong proponent for global human rights standards, would support water-right standards, it has taken an approach that (for the most part) leaves such regulations up to each state government. Do the United States current water laws violate international human rights standards?

OH1 Machine Learning Accuracy in Automatic Part-Of-Speech Tagging

**Jacob Krantz, Maxwell Dulin**

An automatic part-of-speech (POS) tagger analyzes words of a language and categorically assigns parts of speech to them. These tags can be as detailed as noun-plural or even proper-noun-plural. Difficulty arises in situations where certain words may be tagged in multiple ways depending on the context. Part-of-speech disambiguation is thus required. Rule-based POS taggers use hand-written rules of linguistic features and syntactic structures. Probabilistic POS taggers do not rely on linguistic knowledge. Instead, they learn to map categories to words based on large collections of examples. Our probabilistic approach involves a Hidden Markov Model (HMM) trained using the already tagged Brown Corpus. The Brown Corpus was the first million-word corpus of tagged English writing. An HMM assigns a sequence of labels that are not observable in this case, POS tags to a sequence of items that are observable in this case words. The Viterbi Algorithm, a well-known dynamic programming algorithm, is used to find the most probable sequence of POS tags for a given sequence of words. We show that 1) a POS tagger can be trained on a portion of the Brown corpus and 2) the accuracy of the tagger improves with size of the training set. We trained our tagger on 5%, 10%, 15%, 20%, and 25% of the Brown Corpus drawn from the Editorial and Romance sections. As expected, our tagger improved with the size of the training set.

OH2 First Derivative Zero-Crossings to Aid in Automatic Speech Recognition

**Carter Timm**

A new method is introduced to produce approximations of general waveforms using non-uniform, event-driven sampling. Rather than the traditional uniform sampling method employed throughout the industry, signals are sampled when the wave in question exhibits a first-derivative zero crossing. The effect of this is that only the peaks and troughs of the signal are retained. A single-frequency cosine wave can then be interpolated between two adjacent samples to obtain an approximate piecewise representation of the original signal. The distribution of these frequencies can in turn be used to determine information about the original wave. This paper examines the usefulness of this information in the context of phone classification for automatic speech recognition. Acoustic phones in the English language are classified into four distinct categories – general consonants, semivowels, unvoiced consonants, and vowels. A K-NN classifier with K=3 is employed to classify the phones context-free, meaning only the sounds of the uttered phones are examined – no surrounding information is used. The classifier reports an overall accuracy of 39% over the Buckeye Corpus of conversational speech, with categorical accuracies of 31.9%, 2.4%, 13.5%, and 52.5% respectively. Further research is necessary for the proposed method to become feasible.

OH3 Communication's Interpretive Algorithms and Re-Compilation Thresholds: Literature as Engagement Emulator

**Joshua Tuttle**

It recently became clear that the central cause of the division in our country in the wake of our recent presidential election is a lack of understanding between different groups of people. Even more worrisome, the very possibility of understanding has vanished, replaced by an insistence that any disagreement stems from ignorance, hate, or insanity. We currently lack any mechanism to return to the possibility of mutual understanding which would allow us to address the animosity that has replaced our discourse and lead us back to genuine discussion. Rhetoricians Donald Davidson and Stephen Yarbrough frame this type of inter-relational breakdown as a failure of communication stemming from the limits of language. Their models evolved from the lessons of deconstruction, but hold that the arguments of deconstruction amount to a warning rather than an impenetrable barrier. Continuing from Davidson and Yarbrough's models of communication, I posit that a text can stand in for one of the interlocutors in Yarbrough's model. The framework I will describe shows that if a reader can interlocate with a text, then literature can function as an empathy laboratory, a sort of simulation chamber which allows a reader an opportunity to practice the techniques of understanding that lead to communication, increasing the reader's propensity toward performing the difficult act of understanding while also strengthening his proficiency. Finally, I use Charles Brockden Brown's American Gothic novel *Wieland* to demonstrate these properties internally between the characters and externally on the reader.

OH4 Fundamental Frequency Analysis with Speech Processing Tools for Large Corpora

**Rianne Lyons**

The particular group of speech patterns present when adults speak to infants and toddlers is called child-directed speech (CDS) or motherese and has as a significant characteristic increased fundamental frequency (f0). It has been shown by VanDam and De Palma (2014) that soft computing techniques in automatic speech recognition (ASR) are highly effective for examining linguistic data on a large scale and that such techniques can produce results that might not have been found otherwise, specifically with regard to parents' use of f0 in CDS. These conclusions were reemphasized later by the same researchers' (submitted) second study using over 7,000 hours of recorded speech (increasing on the previous 500 hours): it resulted in amended findings about fathers' use of increased f0, showing that the presence of a large corpus increases the precision of ASR soft computing techniques. Building on these results, I will use the same software and data from the LENA (Language ENvironment Analysis) Research Foundation to examine over 12,000 hours of recorded speech. With such a large increase of the corpus size, an analysis of extracted f0 may result in even more precise findings and new insights about natural language processing in ASR. I will also update the user interface of the recording analysis code for eventual inclusion in the HomeBank repository of ASR processing software, representing a significant contribution to the tools available for analyzing recorded speech.

O11 Is Hildegard of Bingen a Role Model for Women Today?

**Abigail Nye**

Hildegard of Bingen had a profound impact on the way in which women were viewed in ministry. With the development of gender equality in the churches, it is necessary to look back upon theological history to see what work has been done on this issue. Using Hildegard of Bingen's sex complementarity view on men and women, this research looks into the origin of feminist theology and the validity of equality of men and women in the church. From Hildegard's decision to leave a co-ed monastery, her call to public preaching, and her development of the Sex Complementarity position, this research calls to attention all aspects of the development of feminism in the early middle ages and the place that this doctrine has in churches today.

O12 If at First You Don't Succeed: Grassroots Efforts to Solve the Problem of Homelessness

**Chawna Crawford**

The purpose of this study was to describe the problem of homelessness as it pertained to other sociological topics such as military veterans, LGBT+ (lesbian, gay, bisexual, transgender, etc.) communities, income disparities and poverty, alcohol and substance abuse, mental health, and policy and social changes. I used secondary research from numerous peer-reviewed source as well as primary research in Spokane and Spokane Valley, Washington. In addition, I interviewed the founder of Giving Back Packs, a grassroots non-profit organization in Spokane designed to fill backpacks with necessities to give to the homeless population locally. I also interviewed members of the Spokane county homeless population to give faces and feelings to the problem of homelessness. I utilized the ideas of several sociological theorists and theories like Max Horkheimer, Émile Durkheim, Erving Goffman, Karl Marx, Max Weber, and Feminist, Critical and Labeling theories to expand and support the ideas and the data. I kept in mind the goals of liberation sociology as well. My findings were both qualitative, in the form of interviews as well as quantitative using statistics and demonstrated the need, in facts and feelings, for not only the change urgently needed in the human narrative, but as well as in policy at the local and national levels. I concluded by offering recommendations to lessen the problem of homelessness.

O13 Breathing Techniques Used to Conserve Air in a Self-Contained Breathing Apparatus

**Megan Napier, Aliyah Miller, Maddie Sessler, Jessica Cary, Emma Wolfram**

Structural firefighters are trained to alter their breathing pattern to minimize the use of air in their self-contained breathing apparatus (SCBA) in the event they become trapped. PURPOSE: This study was conducted to measure the effects of different breathing patterns on ventilation (VE) to determine if skip breathing (SB) and deep breathing (DB), with and without simultaneously controlled breathing frequency (fb) and tidal volume (TV) decreased VE. METHODS: Sixteen participants took part in five different 10 min trials consisting of normal breathing (NB), DB, SB, deep breathing modified (DBM) and skip breathing modified (SBM). During the trials, TV, fb, VE, respiratory exchange ratio (RER), SpO2, and end tidal CO2 (EtCO2) were measured. Participants were instructed to perform the DB trial, and follow a firefighter SB protocol during the SB trial. For both the DBM and SBM trials, the participants were instructed to have a fb half that of their NB fb, and a TV 1.5 times that of their NB TV. RESULTS: VE differed significantly among the different breathing techniques (P < 0.001).

Specifically, VE (mean  $\hat{\mu}$  ± sd) during NB (9.20  $\hat{\mu}$  ± 1.93), DB (11.30  $\hat{\mu}$  ± 4.64), and SB (9.74  $\hat{\mu}$  ± 3.66) were significantly greater than VE during DBM (6.72  $\hat{\mu}$  ± 1.20) and SBM (7.04  $\hat{\mu}$  ± 1.34) ( $P < 0.01$ ). CONCLUSION: Increasing TV from baseline by a greater amount than decreasing fb from baseline during DBM and SBM resulted in a lower VE compared to NB. DBM and SBM have the potential to prolong the air supply of a SCBA.

OJ1 Curating Collective Memory: Awakening Nationalism Through Mexico's Museums

**Sarah Sprouse**

Museums are sites for the play of identity, with displays involved in defining the identities of communities or in denying them identity. How museums display objects or depict different cultures has a profound impact on how those cultures are perceived, and in some cases, how they see themselves. In Mexico, the birth of the museum coincided with the "birth of the nation." While the museum as a particular kind of cultural institution had been around since the period of Independence, after the Revolution of 1910, museums began to proliferate at a greater pace. At the close of the Revolution there were two public museums in the country. By 1964 there were at least forty museums of various types open in Mexico City alone. Over the nineteenth and twentieth centuries, the museum in Mexico has evolved from fairly crude storehouse of antiquities, to a highly organized space of regulation, education, and citizenship. Far from a static archive of objects, the museum formed part of a dynamic negotiation that involved the nationalization of universal scholar disciplines; the remapping of authority within a rhetoric of inaccuracy; the ideological pull of transcendent nationalism; the prestige of international exposure; and the powerful narrative potential that drove the categorization, placement, and contemplation of patrimonial objects. This session examines how nineteenth-century archaeological museum displays were geared to appeal to the ideal citizen who, inspired by the transcendent and silent "speech" of patrimony and awed by the revelation of its secrets, would awaken to his or her own latent sense of nationalism.

OJ2 A Legal Perspective on American Rights, Responsibilities, and Shortcomings with Man's Most Precious Resource: Water

**Anastasia Borseth**

This paper analyzes the ways in which Jerry Uelsmann's photography utilizes the medium of photography to participate with surrealist art. In the age of Photoshop and digital art, Uelsmann uses a classic style of manipulation and overlay in the darkroom as a part of his creative process. This technique is one that is time honored in art photography, and in using it, he participates in a larger conversation about how photography's role as an artistic medium plays out in the modern world. By using Freudian principles and largely leaving the interpretation of his images up to the viewer, Uelsmann encourages speculation. His images don't conform to any one idea or interpretation. When comparing him to other surrealists such as Salvador Dali, the visual inconsistencies and the ways in which both artists depict some sense of reality challenges individual's perceptions of what they believe to be real. Uelsmann's works challenge perceptions of reality and visual experience and use similar principles and properties to surrealists. By using the objectivity of photography, Uelsmann is able to capitalize on the medium of photography to encourage the viewer to analyze their own perception of reality. In this way, Uelsmann uses photography and surrealist in a new innovative way to challenge perceptions and distort reality.

OJ3 The Differing Views of Eggleston's Work Over Time

**Allison Adachi**

This paper looks into William Eggleston's journey, exploring how and why his photographs became so successful by analyzing the change in reception over the course of 40 years. William Eggleston worked with color photography in a time where color was not considered artistic and had no place in art galleries. He first exhibited his work in 1976 at the MoMA, which sparked a wide range of reactions that were mostly negative. The New York Times went as far as to state that this exhibition was "the most hated show of the year". By looking at his work in the years to come, his style and approach didn't drastically change, however the reception of his work flipped over completely. He was a pioneer of color and ahead of his time. I would like to propose the Eggleston did not revolve his work around the times, but the changing times started to mold to his work, and in return, the public's overall view of his work became positive. When snap shot photography started to become increasingly more popular and more widely accepted in the late 80s and early 90s, critics took another look at Eggleston's work with a new mindset. From the 2000s and on, more articles have been published on how Eggleston is inspiring and influential in the art world and to young photographers. He is now a legend and labeled the "father of color photography".

OK1 Measuring Salary Inequality Among University Professors

**Joseph Kincanon**

We compare salary distribution of university professors at private master's institutions to those of public master's institutions. First we fit a traditional Lorenz Curve to both data sets to compare Gini Indices. Then we fit a more sophisticated curve to the data sets and look at some of the information provided by these curves.

OK2 Our Future Fathers: Examining Seminarian Experience on College Campuses

**Shannon Liska**

Before becoming a priest, young men attend minor seminaries to attain a collegiate degree. Some of these seminaries coincide with private, Catholic universities, enrolling the seminarians as undergraduate students on the campuses while they live regimented lives in the seminary. Meanwhile, Institutions of higher education, both public and private, see students falling away from religious practice. Furthermore, many Roman Catholic schools see students leaving their Universities with less religious affiliation and practices than which they came in (Cidade and Gray). Given this climate, seminarians are put in a unique social position. While they live in regimented, orthodox, religious seminaries, they are taking classes and living on increasingly less-religious college campuses. To examine this, eight in depth interviews with seminarians from four different diocese and two different college campuses were conducted. Generally, the seminarians are thankful for the human, college experience they get on campus. Despite that, they are not involved with University ministry and discuss



the institutional tensions that can arise between seminary leadership and the university. They acknowledge a lack of religion on these campuses and discuss how that can affect their classroom and campus experiences. Given that these young men are the future leaders for the church, this opens up further space for research in religion on college campuses, effective religious education of young people, young people in religious life, and the interaction between lay people and those in religious life.

OK3 Deeply Divided: Conservative Students on a Liberal Campus

**Callen Aten**

There is no doubt that this previous presidential election was contentious. If nothing else, it exposed some deep divisions that exist in our national society. Being that I am situated at a Jesuit liberal arts university, I became curious about the voters on my campus that voted for President Donald Trump. What were their reasoning's for voting this particular candidate? Did they have common reasoning with students who voted for Hillary Clinton? Because our campus is a predominately liberal campus, I was also interested in what Trump-voters thought about the acceptance level of this campus. My research will use data from the 2016 General Gonzaga Survey an annual online omnibus survey administered via SurveyMonkey by the Department of Sociology and Criminal Justice. This survey contains a core set of questions related to the overall college experience (academic and social) and rotating sets of student-designed questions. This year's survey will be administered in mid-October and feature questions on the 2016 presidential election, student political activity, campus climate, stress management, and student's feelings of safety and fear on and around campus. The survey will take approximately 10-12 minutes to complete. The General Gonzaga Survey is administered annually to students over the age of 18. To be eligible, students must be enrolled full-time (12 or more credit hours). Students who are studying abroad are excluded. An initial sample of approximately 1,200 students will be randomly selected from the sampling frame of 4,800 students. Those students who were involved in developing the survey will be excluded from the sample.

OK4 Experiences in a Private University's Choir Group

**Kevin Dolan**

This research project uses information gathered through observations and interviews to analyze the experiences of students in choir at a private university. Data from observations and interviews are used to determine the role of various factors in the experiences of students in this choir group, including (but not limited to) gender, class, and race. The status of various roles within the choir and the way that those roles affect the experience and identity of choir members will be analyzed. This analysis will also explore why students occupy these roles and the ways in which they occupy them. The way that students occupy these Interview and observation data will be used to explore levels of investment, commitment, and happiness among choir members. This data will also be used to explore why students participate in choir and how student's participation in choir affects the way they perceive themselves, each other, and the world around them.

OL1 How does digital communication affect Millennial Sexuality and Intimacy?

**Christian Astran**

The newest generation to enter into a position of sexuality maturity is the Millennial Generation. However unlike previous generations Millennials have access to incredible tools of the digital age that revolutionized the basic aspects of human social interaction. The intimate type of interaction experienced by humans is sexual interaction and its related forms of communication. Sexually based interaction as well as every other part of human communication is radically changed by digital technology. The goal of this presentation is to examine how the basic tenants of human sexually based interaction are fundamentally altered by the means of digital communication platforms.

OL2 Romantic Attachment Styles and Relational Maximization

**Katie Wilcox, Amanda Lacayo**

Have you ever wondered why some people are so concerned with finding "The One" ← perfect romantic partner? This study examines the correlation between the four attachment styles (secure, dismissive, fearful, and preoccupied) and the desire to make the best possible choice of partner, known as relational maximization. We hypothesized that the secure attachment pattern would have a negative correlation with relational maximization, and insecure attachment styles (dismissive, fearful, and preoccupied) would be positively correlated with relational maximization. In addition, we proposed a research question of how the three sub-dimensions of relational maximization (alternative search, decision difficulty, and high standards) are related to each attachment style. 203 participants completed the Relational Maximization Scale (Mikkelson & Pauley, 2013) and the Attachment Style Measure (Guerrero, Farinelli, & McEwan, 2009), in addition to important relational and demographic questions. Results showed that insecurely attached individuals are more likely to exhibit relational maximization behaviors. Alternative search and decision difficulty appeared to play a larger role in predicting attachment styles than the dimension of high standards. Implications and possible directions for future research will be discussed.

OL3 Global Norms Regarding Sexuality

**Lauren Weiser**

The purpose of my research was to discover the views of sexuality in different global communities, as well as the justification for those views. My original goal was to find the attitudes regarding all superfluous sex, or sex that is not done for reproduction. This included pedophilia, bestiality, necrophilia, and any other type of non-necessary sexuality. However, because these categories are taboo pretty much everywhere, there was little data to be found on how many people participate in these kinds of sex and what attitudes are towards them. I sought to discover information about Brazil, Russia, India, China, South Africa, the Netherlands, and Afghanistan, as I believe that these countries represent a wide range of beliefs, cultures, and religions. The main goal was to find if there was a correlation between certain beliefs about sexuality and specific demographics. I found that those countries which have a higher degree of religiosity were less open to a

wider range of sexuality, with the exception of Russia which is socially conservative but has a low degree of religiosity. To find this information, I read surveys, news articles, and research papers which discussed sexuality in the aforementioned regions.

OL4 Female Sexuality in the Odyssey: The Penelopean Perspective on Fidelity

**Kristin Bertsch**

Most scholarship related to sexual double-standards and “oxymoronic” fidelity in the Odyssey are analyses on the comparative sexual practices of Odysseus and Penelope, and the resulting discourse on sexual standards relates primarily to this gender disparity. There is another issue here related to discourse and gender disparity in contributions to discourse on sexuality. Discussions on female sexuality in the Odyssey have primarily to do with Penelope’s fidelity/chastity relative to standards imposed by men, and even in feminist criticism Penelope’s sexual confines are analyzed relative to these male-dominated discourses on sexuality. Penelope’s voice thus been largely removed from the conversation, and she has become passivized. There is a critical passage in Od. 23 wherein Penelope addresses her sexual self-concept and perspective on sexuality. Penelope’s description of her own fidelity reveals a complex understanding of the origins, meanings, and ramifications for sexual behaviors. From a feminist literary perspective, Penelope’s narrative account needs proper analytic treatment and inclusion in the established discourse on gender and sexual standards in the Odyssey. This paper scrutinizes the voices in the classical literature and the history of its criticism to find trends in approaches to understanding Penelope’s voice, and performs a comparative analysis of these voices against Penelope’s own vocalized self-concept. The purpose of this paper is to explore the ways in which certain voices are focalized in the history of Penelopean criticism, and to recover Penelope’s voice as an active participant in the critical discourse.

OM1 Post-Death Rhetoric and America’s Understanding of the Inescapable

**William Stephan**

The notion of death is widely misunderstood and seldom spoken about, however, we as a nation have developed tangible ways to communicate about this very abstract phenomenon. The idea of dying and death is extremely complex in nature as it marks the end to our physical, palpable being, leaving us to interpret an afterlife or lack thereof. In the United States, death and the passing of an individual takes on an unwritten, standard protocol that is followed regularly and without much thought. This manner of dealing with death provides insight as to how Americans understand death and what Americans deem as valuable during one’s singular, unique lifetime. Inability to accept or be prepared for the inevitable, in large part, comes from a lack of understanding. The notion of death will never be understood fully and no one can entirely and adequately prepare themselves for the passing of a loved one, but a society that innately shadows the inescapable only complicates an already bewildering reality. In an attempt to gain further insight as to how Americans both communicate about and understand death, I have employed a qualitative study of obituaries and sympathy cards. Through the study of obituaries, all of which vary in faith background or lack thereof, it has provided a clearer understanding of what Americans value in a lifetime. Through the close examination of sympathy cards, both religious and secular, it has highlighted how the United States understands death. In addition to this, it shows deep similarities in the sympathy processes of both secular and religious populations.

OM2 Exploring the Wall Between Bible and Baphomet: Media Coverage of Church-State Conflicts

**Elizabeth Jacobs**

Covering issues about law or faith poses unique challenges for modern journalists due to shrinking newsrooms. Small news staffs of reporters must cover a broad spectrum of stories and write for both digital and print stories. This pressure leads to more general reporters and fewer specialists, specifically for legal and religious journalism, resulting in less depth and explanation of key concepts. This study seeks to build upon previous research on media coverage of law and faith by exploring two specific cases of church and state coverage in order to better understand how current journalists are reporting on these complex issues. Content analysis of traditional print and digital-only media around two cases involving Tennessee making the Bible the state book and Satanists pushing for a statue in Oklahoma, reveals a broad assumption of audience familiarity with key constitutional and religious ideas. Additionally, this study uncovers the limited nature of sources, and heavy reliance on visuals for online publications. Interestingly, when news coverage ventures into the rare or unique, explication does emerge, suggesting that some lack of legal or religious depth may be attributed to a belief that audiences don’t need it, or don’t care about the depth of legal and religious issues.

OM3 Christianity in Politics: Using Religion to Advance American Exceptionalism in Trump’s America

**Abigail Sedra**

The 2016 Presidential election has unveiled the true depth of division within the American political sphere. Additionally, religiously-charged rhetoric throughout this election cycle has revealed the attitudes and fears found in America’s voting population. This essay aims to achieve one overarching goal: to examine how religious rhetoric influences attitudes and public policy in times of national and international turmoil. A close textual analysis of President George W. Bush’s Address to the Joint Session of the 107th Congress on September 20, 2001 illuminates the ways in which political figures use Christianity as a tool to build a case for war. By connecting concepts of traditionally right-wing Christian values to American exceptionalism, President Bush invokes values familiar to most Americans to develop a comforting political rhetoric that works to assure a vulnerable nation. Moreover, the speech constructs an image of a superior American way of life to justify launching a global war on terror and sacrificing inherent civil liberties through the establishment of the Department of Homeland Security and the subsequent passage of the USA PATRIOT Act. The essay concludes by drawing parallels to recent history with today’s political climate of fear and manipulation, with a resolute call for more critical scholarship of the rhetoric of religion and its influence on global politics and international relations today.

ON1 The Differing Views of Eggleston's Work Over Time

**Allison Adachi**

This paper looks into William Eggleston's journey, exploring how and why his photographs became so successful by analyzing the change in reception over the course of 40 years. William Eggleston worked with color photography in a time where color was not considered artistic and had no place in art galleries. He first exhibited his work in 1976 at the MoMA, which sparked a wide range of reactions that were mostly negative. The New York Times went as far as to state that this exhibition was "the most hated show of the year". By looking at his work in the years to come, his style and approach didn't drastically change, however the reception of his work flipped over completely. He was a pioneer of color and ahead of his time. I would like to propose the Eggleston did not revolve his work around the times, but the changing times started to mold to his work, and in return, the public's overall view of his work became positive. When snap shot photography started to become increasingly more popular and more widely accepted in the late 80s and early 90s, critics took another look at Eggleston's work with a new mindset. From the 2000s and on, more articles have been published on how Eggleston is inspiring and influential in the art world and to young photographers. He is now a legend and labeled the "father of color photography".

ON2 Entertainment News: How Comedy Influences National Politics

**Natalie Haskell**

National politics currently stands at the forefront of the minds of many Americans. With a stunning 2016 presidential election and unrest filling the nation, the United States faces a time largely marked by fear of what the future holds from both sides of the aisle. One constant factor in all of this: mass media. Throughout recent developments in national politics and past historical moments, media outlets have provided the public with necessary news while simultaneously wielding significant influence on public opinion. However, in recent years the line between news media and entertainment media has become blurred. As such, I intend to examine the role comedic television entertainment, such as Saturday Night Live, plays as a reputable news source. Additionally, I plan to investigate the influence these shows have on public opinion through polling surveys from the 2008 and 2016 presidential elections. During former President Barack Obama's race against Senator John McCain, Saturday Night Live frequently portrayed McCain's running mate, Sarah Palin, in a negative light. In turn, public opinion of Palin fell because many people viewed her as unqualified and lacking intelligence, which ultimately contributed to a loss for the McCain Palin ticket in the election. Contrastingly, President Donald Trump experienced similar ridicule from shows like Saturday Night Live, yet the results of his election differed from that of McCain's. This discrepancy along with the influence of comedic television in national politics present an interesting opportunity to explore the effects of a morphing entertainment and news media essentially into one.

ON3 The Effect of Extroversion Levels on Desired Affection

**Madison Burke, Skyler Noble, Rachel Rogers**

Do personality constructs affect the type of affection individuals desire to receive? This study seeks to understand the relationship between the personality constructs of extraversion and introversion and an individual's affinity towards certain types of affection. Traditional personality constructs have been explored in the field of psychology and applied human behavior, however the purpose of this study is to apply these concepts to a communication context. This study utilized Floyd's (2006) three types of affectionate communication: verbal, nonverbal, and supportive, to measure how individuals desire to receive affection. We hypothesized that extraversion would be positively related to a desire for affection. Results from 133 participants showed a strong trend between extroversion levels and nonverbal affection. Specifically, the subdimensions of sociability, thrill, and joy were positively related to nonverbal affection. Further, joy was positively related to verbal affection. Implications and possible directions for future research will be discussed.

OO1 Reforming Grace: How Sweet the Sound

**Kathryn Benson**

My research explores liturgical music reformation in the Catholic tradition in America from early 1900s through modern day. I first focus on the age of Pope Pius X and his papal encyclical *motu proprio tra le sollecitudini*. Pope Pius X stresses the need for holiness within liturgical music through the use of the Gregorian Chant, an emphasis that reflected the preservation of the more traditional structure of Church music. Liturgical music shifted toward a more simplistic style by the 1960s with the publication of music in Catholic Worship. The need to bring the church to the people and a desire to increase laity participation drove the music of the Church to lose some of its sacredness. A group of students from St. Louis University, the St. Louis Jesuits, strengthened this movement with their compositions that were catchy and encouraged singing in the pews. Some of their songs, "City of God" and "Be not Afraid," still remain popular today. However, in the revision to Music in Catholic Worship, Sing to the Lord, published in 2007, reflects parts of both of these radically different movements in the reformation of liturgical music. My research concludes with a recognition of a new shift that attempts to bring the ideas of Pope Pius X and the St. Louis Jesuits together. With a desire to revert back to the sacred and more traditional nature of the Catholic Church (pre-Vatican II) while still maintaining a shift that has encouraged parishioner participation, I believe that this new shift is a welding of two distinct philosophies about the nature of music in Catholic mass.

OO2 History of Resistance to and Recognition of Reproductive Rights in the RCC: The Theology and Practice

**Judith Mata**

The debates on Reproductive Rights and Fertility Regulation Methods arose in the Roman Catholic Church with the second feminist wave and the second Vatican Council. Since this time, Catholics have struggled over this issue while others endorsed with passion Pope Paul VI's Encyclical *Humanae Vitae* (1968) and Pope John Paul II's *Theology of the Body* (1979-1984). This research focuses on two aspects: First, what exactly motivates the teachings related to fertility regulations, issued by a Magisterium composed of men only? Why are women excluded from these debates and why are they the only ones in need of forgiveness when it comes up to the painful question of abortion? Recently Pope Francis has set some signs for change and possible evolution. Do these signs point to a renewed theology and ethical thinking

inclusive of women? Second what should the relationship between these theological issues and practical realities look like? Is it only up to the theological discourse to determine boundaries, rules and laws to which everyday life has to conform? Or can practical life make an authentic contribution to ethical and moral thinking from a Christian and Catholic perspective, other than a submissive reception of teachings elaborated only by men?

OO3 From Cultural Outsider to Cultural Insider: How Movies Americanized Catholicism

**Madison Schreiter**

As Motion pictures transitioned from the silent era into talkies hysteria over the immoral nature of movies and the effects of movies on impressionable youth began to seize the nation. Sex, violence, crime, and social issues dominated the screen until the Depression and the decline of profits forced Hollywood production companies to reevaluate the subjects of their films. With major church institutions, especially the Catholic Church, threatening to boycott indecent movies, major film studios were forced to institute self-imposed censorship. Cultural warfare was sparked by the provocative films of the post-silent era and the Catholic Church was determined to win it. By 1933 a new wave of scandals and the rise of the Catholic Legion of Decency forced the production companies to amp up their level of self-censorship. This paper will attempt to examine whether or not the Catholic Church's effort to censor Hollywood helped Americanize and normalize Catholicism as a respectable religious choice. After taking into consideration the domination the Catholic Church over the movies, the Catholic Church's censorship of Hollywood made Catholicism appear to be the defender of American morality and society. These efforts helped normalize Catholicism to the mainly protestant American public. Movie censorship allowed for Catholicism to move from an outside minority group and become an accepted form of American Christianity.

OO4 Stewarding Privilege: A Call to Imago Dei

**Nicole Busacca**

Human beings live in a complex world of intersecting identities and the systems that interact with them. Attributes such as race, gender, economic status, ethnicity, ability, and citizenship status are among many of the aspects of existence which, due to systems of social power, influence one's life experience. Opportunity or disadvantage, privilege or oppression: these are the products of power and the lack of it. Possession of power inevitably involves benefits for the powerful that effect detriment for the powerless. The question then is this: what should one do with their privilege? This inquiry within Christianity is colored by the doctrine of imago dei, the belief that human beings were made to bear the image of God. Just as with any other facet of life, Christians' interaction with their social power should embody the character of God. Jesus' incarnation, death, and resurrection are paradigmatic of the Lord's character. They communicate that's nature is just, and that the embodiment of justice requires the stewarding of privilege. This research will investigate why image-bearers of God must reject the sinful abuse of privileges and meet needs, how believers have done so throughout history, and how today's social landscape informs image-bearing for those with power.

OP1 The Role of the *arrA* Gene in the Dissimilarly Arsenic Reducing Bacteria, *Shewanella* Sp. Strain ANA-3, with Arsenate and Arsenite

**John Andrianu**

The Spokane River flows 90 miles from Lake Coeur D'Alene in northern Idaho through Spokane, WA and ultimately empties into the Columbia River. Sediments of Lake Coeur D'Alene are contaminated with tailings from nearly a century of unregulated mining activities in the Coeur D'Alene River watershed and contain toxic heavy metals, including arsenic, at extremely elevated concentrations. These metals are linked to health problems including brain and nerve damage in children. Bacterial metabolism can play a significant role in the biogeochemical cycling of arsenic in river and lake sediments. Dissimilatory arsenic-reducing bacteria (DARB) can use arsenate (As<sup>5+</sup>) as an electron acceptor in anaerobic respiration, reducing it to arsenite (As<sup>3+</sup>). While arsenate is relatively immobile in aquatic environments, reduced arsenite is soluble, thus posing a threat to human health and safety, recreation, and the economy of the Spokane-Coeur d'Alene region. The *arrA* gene encodes for an arsenate reductase within the DARB respiratory chain and has been used to detect DARB in the environment. In this study, we quantitatively examine levels of *arrA* gene expression in arsenic metabolizing DARB (*Shewanella* sp. strain ANA-3). Furthermore, the concentrations of DARB in sediments samples were examined by a modified micro-Most Probable Number (MPN) assay, the data from which suggest that there are seasonal effects on DARB concentrations in Spokane River sediments. We will next test sediment samples from the Spokane River region to determine DARB levels and activity, which could help to devise clean-up strategies for the river moving forward.

OP2 Development of Cucurbit[8]uril as a Supramolecular Clip for Beta Hairpin Peptides

**Hannah Clements**

Nature utilizes an array of supramolecular interactions in order to mediate the assembly, disassembly, and function of catalysts and receptors. Synthetic mimicry of these processes is anticipated to yield peptide and miniprotein components that can interface with biological systems and modulate their behavior. The understanding of the structural basis of beta sheet interactions is still a wide area of scientific exploration, and the development of methods for assembling short peptides into supramolecular mini proteins is of great interest for understanding these interactions. My research aims to provide evidence that natively non-folding short peptides can be induced into beta hairpin structures via the supramolecular interactions between the terminal residues of designed peptides and the supramolecular host cucurbit[8]uril. Cucurbit[8]uril (CB[8]), is a ring shaped molecule with a hydrophobic cavity that can serve as a supramolecular host to a variety of guest molecules. The encapsulation of a guest molecule in the hydrophobic cavity is thermodynamically favorable to the encapsulation of water within the cavity. The work of Urbach et. al has shown that CB[8] can host non-aromatic residues including lysine, as well as N-terminal aromatic peptide residues, with a particularly high propensity for the binding of the Tyr-Leu motif to the CB[8] cavity. Guided by this, I propose a strategy of supramolecular beta hairpin peptide assembly control by selective sidechain co-encapsulation using CB[8] as a supramolecular clip to bring together two peptide strands.

- QQ1 Free Speech and Football: Colin Kaepernick and the Black Lives Matter Movement  
**Josiah VanWingerden, Matthew Spencer**  
 Colin Kaepernick, a professional football player, advocated on behalf of the Black Lives Matter Movement this past fall causing a ripple effect across the National Football League. This study aimed at measuring and understanding the relationships between advocacy by athletes and attitude change on social issues. In particular, the study examined how a particular football culture responded to Kaepernick's messages. 106 participants from a local collegiate football team completed both pretest and posttest measures of police violence and racism. Our study used three separate randomly assigned conditions. The first condition included Kaepernick's messages without identifying him as the source. A second condition identified Kaepernick with the messages. The final condition identified Kaepernick while excluding his messages. Additionally, the study controlled for external factors that could have influenced the results. This study found that Kaepernick's messages had no significant influence on attitudes of police violence and racism. However, when Kaepernick was identified, the perceptions of racism in our society decreased while the perception of police violence increased. Implications and possible directions for future research will be discussed.
- QQ2 Connectedness: An Analysis of Power in Social Networks  
**Marissa Moffett**  
 Social Networking has existed as long as people have existed. But, with growing globalization and technological advancements, networking has become easier than ever and has created an extremely connected society. This paper will examine what power in a network looks like through several examples such as the social network of fourteenth century Florence. Further, it will look at the Small World problem and how this phenomenon plays out in society. Using concepts of network analytics, social graphs, and the centrality of power, the paper will examine the location of power in social networks and consider the potential implications of this on social networking and society as a whole.
- QQ3 Inclusion, Affirmation, and Equity in the Classroom  
**Marilyn Melgoza, Caleb Dawson**  
 Retention is the primary theme of literature for underrepresented students in higher education. This research will contribute to that literature by unearthing the impact of classrooms in retention and equity of learning experiences. The mainstream efforts to retain underrepresented students on college campuses pertain to support models and services, which may be viewed as elective and supplemental to the at-large cultural climate in academic learning environments. Not enough research is committed to the significance of academic learning environments for the retention and formation of well-educated cultural beings. Since academic curriculum and instruction are the trademark of higher education and cultural differences are a primary point of tension in the 21st century, it is imperative to understand the role of faculty in cultivating inclusive and affirming learning environments that optimize a quality and equitable education for all students. This investigation will pursue insights into the following questions: How do underrepresented students perceive academic learning environments with respect to cultural differences and their cultural identity development? What characterizes a culturally inclusive and affirming learning environments? How do students respond to positive and negative intercultural experiences in the classroom?
- QQ2 Connectedness: An Analysis of Power in Social Networks  
**Marissa Moffett**  
 Social Networking has existed as long as people have existed. But, with growing globalization and technological advancements, networking has become easier than ever and has created an extremely connected society. This paper will examine what power in a network looks like through several examples such as the social network of fourteenth century Florence. Further, it will look at the Small World problem and how this phenomenon plays out in society. Using concepts of network analytics, social graphs, and the centrality of power, the paper will examine the location of power in social networks and consider the potential implications of this on social networking and society as a whole.
- OR1 Hidden Truths: Public Art as a means of Social Change within Urban Cities  
**Nodia Rogers**  
 The purpose of this research was to on small scale look at the issues faced by Urban cities, and examine the use of public art as a means of social change in these areas. By zooming in on Tacoma, Washington specifically this research critically examined connections between the rich and troubling history found in Tacoma, surrounding gang violence, gentrification, and the War on drugs, and the way these problems were combatted. Within this analysis, different works of art are examined and critiqued based on their ability to work well within the urban context as a successful piece of public art. By using Tacoma as a lens, we can then work through these ideals in larger contexts and answer the following questions: Does public art work as a means of social change in Urban cities, and if yes what makes a work of art successful or not successful in these spaces?
- OR2 Environmental Policy with Respect to the Future  
**Corey Horn**  
 Over the last decade environmental issues and policies have taken center stage in both scientific and political debates. With overwhelming data that supports rising CO2 levels in our atmosphere leading to warmer global temperatures, the complex question of "what now" is being tackled by professionals all around the globe. However, many policies and theories such as carbon taxes or Garret Hardin's Tragedy of the Commons, only deals with issues that affect today's society and population at an environmental level. Research by Elliott in his essay dealing with Anthropocentric Indirect Arguments (AIA) shows that during times of less economic prosperity, individuals are less inclined to

support policies that do not directly benefit themselves. In this paper, I will argue that taking an AIA approach to environmental issues today will have two positive lasting effects. First, individuals of today will see direct benefits to policies that benefit the environment later in time, and second, these policies will have respect to future generations lessening the burden of responsibility to create positive environmental change and creating a healthier future generation.

### OR3 Perceptions of Inclusion

#### **Blake Buchanan**

This research examines perceptions of LGBT (lesbian, gay, bisexual, transgender) student inclusion by non-LGBT students at Gonzaga University. The type of research conducted was survey research, and questions regarding student perception of LGBT inclusion were asked as part of the General Gonzaga Survey (GGS). There were 511 participants who completed the survey, and 469 participants answered questions about the acceptance of LGBT people at Gonzaga University (GU). An example of a question asked on the survey is How accepting do you believe Gonzaga University is of the following groups one of the groups being people who identify as either lesbian, gay, bisexual or transgender. The participants were able to choose from the following responses regarding levels of acceptance: very accepting, somewhat accepting, not very accepting, not at all accepting, or do not know. The survey also produced data regarding religious identity, political ideology, religious and political engagement, and gender. Data analysis has revealed differences in perceptions of LGBT acceptance between religious groups and individuals with opposing political ideologies. For example, out of the participants who identified as conservative, 58.1% believe GU is very accepting of LGBT students, while only 25.4% of participants who identified as liberal believe GU is very accepting of LGBT students. Further findings regarding the intersection of the social variables religious identity, political ideology and gender will be analyzed and discussed. Political engagement is measured by voting participation and religious engagement by frequency of religious practice.

### OS1 Cultural Variability in the Construal of Moral Violations: Americans React More Intensely to Rights Violations and Japanese React More Intensely to Duty Violations

#### **Teresa Jensen, Kelsey Bajet, Joshua Jacobs**

Previous cross-cultural research on morality suggests that there are three ethics of morality referred to as "The Big Three" These are the ethic of autonomy (emphasizing rights and harm), ethic of community (emphasizing duty and interpersonal responsibilities), and ethic of divinity (emphasizing the preservations of divine natural order of things). All three can exist within a particular cultural context but each ethic may be prioritized differently across cultures. In the current study, we examine the impact of violations of each ethic across participants from the United States and Japan. Participants are given a questionnaire consisting of moral violations under each ethic and were asked to imagine themselves in each situation and respond by judging which of the Big Three each situation represents a violation of and reporting the degree of that violation. Given previously documented cultural differences in values commonly shared between Japanese and American cultural contexts, we expect that the Japanese participants will perceive more situations as violations of ethic of community and react more intensely to them relative to American participants who will perceive more situations as violations of ethics of autonomy and divinity and react more intensely to them. We also expect to find several, if not many, identical situations will be construed as violations of divergent ethics across cultures.

### OS2 Cultural Variability In the Persistence of First Impressions: The Role of Relational Mobility

#### **Teresa Derouin, Taylor Kirschenmann, James Vair**

First impressions can be seen across cultures, but their affect differs in regards to relational mobility (RM), which is a social-ecological variable where higher RM context is associated with more freedom to choose one's relational partners, and lower RM context is associated with having relational partners being determined by circumstance. Individualist cultures have been found to be higher in RM relative to collectivist cultures. It is costlier to form the wrong initial impression in lower than higher RM context, because one is more "stuck" in relationships in collectivist cultures. Participants in this study are from a university in the United States and a university in Japan, therefore representing relatively collectivistic and individualistic cultures. Each participant is introduced to a target individual through a series of slides creating either a positive or negative first impression. Later in the experimental condition, that impression is challenged when John's situation is elaborated. The control conditions use narratives that do not challenge the initial impressions. Participants are randomly assigned. Participants will also complete a measure of perceived relational mobility in their own culture. We hypothesize that the explicit impression will be influenced by later narrative for all participants, the implicit impression will be influenced by later narrative for only Japanese participants, and the implicit impressions will continue to be influenced by initial impressions for Americans. We also hypothesize that a mediation analysis will show that these cultural differences in the persistence of initial implicit impressions will be explained by cultural differences in relational mobility.

### OS3 The Psychological Foundations of American Exceptionalism in Climate Change Denial

#### **Devin Ellis, Korrina Asmus-Sivongxay, Kenedy Ramos**

The purpose of this study is to investigate why climate change denial is much more prevalent in the United States than in peer nations in the world. Specifically, we theorize that climate change represents a threat to the dominant perception of control for Americans, which is the perception to be able to influence the environment, as opposed to adjusting to it. US participants will be randomly assigned to priming for an influence oriented perception of control mindset or an adjustment oriented perception of control mindset, followed by manipulation checks and a survey on attitude towards climate change. We hypothesize that those primed with an influence mindset will be less willing to engage in green behaviors creatively and less willing to accept the science of climate change relative to those primed with an adjustment mindset. Eventually, we hope to replicate this study in Japan as well. The findings of this study may help us to understand the psychological foundations of climate change denial in order to promote a sustainable lifestyle.

- OS4 **Examining Sources of Person-Culture Mismatch: Can Marginalizing Situations Cause Behaviors to Deviate from Cultural Norms**  
**Clare Manthey, Jackie Armour, Carly Ball**  
Previous cross-cultural research concerning Person-Culture Match Hypothesis states that when personality and personal values match the norms and values common in one's own society, one's mental health fares better than if there is a mismatch (Fulmer and colleagues, 2010). Previous research has also shown that cultural-person mismatch is associated with marginalization in one's own society (Norasakkunkit et al., 2012). Our aim is move forward with this association to explore the causal direction in the relationship between person-culture mismatch and marginalization. In other words, can culturally marginalizing situations themselves actually cause a person's value system and motivational style to become mismatched with what is normative in his/her own society? In order to answer this question, our study will begin by taking a baseline assessment of participants' culturally relevant values and normative behaviors (i.e., their motivational style and base risk of marginalization). A week later, participants will be randomly assigned to either a marginalized mindset condition, where they will imagine themselves being in a marginalized situation within their society, or to a control condition, where they imagine being in a secure situation in their society. The purpose of these conditions is to manipulate the levels of marginalization in order to utilize it as a true independent variable. Following priming, participants will again complete the same measures that they completed a week earlier. We hypothesize that in the marginalized priming condition, relative to the control condition, cultural values and motivational styles will deviate from what they previously were as well as from what is perceived to be normative in their own society. Support for this hypothesis would suggest that the source of culture-person mismatch may not only stem from the individual's personality profile but may also stem from one's socioeconomic position in his/her society.
- OT1 **Optical Diagnostics of Simple Biogas Flames**  
**Weston Staab**  
The environmental and monetary impacts from disposing of organic waste streams from agricultural, animal, and industrial sources represent a significant cost and potent health hazard in developing world countries. Processing these organic waste streams to create a combustible biogas is a promising alternative to traditional means of disposal. The resulting biogas provides a renewable energy source and the main byproduct of the process is a nutrient rich slurry that can be used as an effective fertilizer. Moreover, for the approximately two billion people who still rely on biomass as a cooking fuel, switching to biogas could play a vital role in mitigating the negative health effects of traditional fuels, e.g. wood biomass and other carbon dense fuels. In the present work, simulated biogas fuels are examined in two flames of simple geometry, but not lacking in complexity: a quasi-1D micro-reactor and a traditional flat flame burner. Optical diagnostics of these flames allows for comparison against detailed chemical kinetic simulations to examine both the reaction chemistries within the flames as well as resulting emissions from the flames. In the micro-reactor experiments, CH-chemiluminescence is used to pinpoint flame position vs. an imposed temperature profile for stable and unstable flame regimes. In the flat flame experiments, line-of-sight absorption spectroscopy using light-emitting-diodes (LEDs) is used to examine CH and OH concentration above the flat flame burner. The combined results from these studies will be used to compare against and improve current chemical-kinetic models.
- OT2 **Estimation of Enthalpy of Desorption for a Metal Hydride using Equilibrium Pressure Data Through a Small Temperature Range**  
**Charles Mielke**  
Metal hydrides are used to store hydrogen for a range of applications, including stationary and vehicular designs. The performance of the metal hydride alloy is a function of the composition. The reversible capacity, equilibrium plateau pressure and enthalpy of desorption are each functions of the metal hydride alloy composition. One of the reasons why metal hydrides are favorable materials for hydrogen storage applications is because the enthalpy of desorption is in the goldilocks regime, whereby the energy of absorption/desorption is not too easy (as is the case with sorbent-type materials) nor too difficult (as is the case with chemical hydrides). The current research is based on calculating the enthalpy of desorption for a given material, using pressure-composition-temperature (PCT) data taken at equilibrium through a small range of laboratory temperatures. The calculated enthalpy of desorption will be compared with literature values.
- OT3 **Phosphorus Sorption Maxima and Equilibrium Phosphorus Concentration for Sediments of the Little Spokane River**  
**Taisiia Feoktistova**  
Phosphorus is used in agriculture as fertilizer since it is one of the nutrients that can limit the growth of plants. However, excessive input of phosphorus from agricultural fields into water bodies can result in eutrophication, which leads to algal blooms, anoxia, and loss of fish species. This study examined sediments from the Little Spokane River, WA, for their phosphorus sorption characteristics using batch-incubation experiments. Sediments were characterized by total organic matter, oxalate-extractable Fe, Al, and P, and total concentration of Ca, Al, Fe, and P. These parameters have shown to affect phosphorus sorption in previous studies. Parameters quantified were the Langmuir adsorption maxima ( $S_{max}$ ) and the equilibrium phosphorus concentration (EPCo).  $S_{max}$  which represented the maximum amount of phosphorus that can be sorbed for a 24-h equilibration time was found to be 33 mg/kg of sediment. The EPCo, which provides information about whether sediments will release or extract soluble reactive phosphorus (SRP) when placed in contact with water, was found to be 0.0121 mg/L. Using these values, the sediments of the Little Spokane River are expected to act as a phosphorus sink. Subsequent studies will explore properties of the sediment that affect the  $S_{max}$  and EPCo.

OT4 Corner Failure of Unreinforced Masonry Buildings

**James Finnegan, Phillip Geist**

This research focuses on unreinforced masonry buildings subject to earthquake forces, specifically failures at a top corner. In geographical locations prone to earthquakes, unreinforced masonry buildings are vulnerable to damage, which could result in injury or loss of life. A literature review on the topic reveals that there is a further need to investigate how the mechanism of failure occurs at these corners. When an earthquake hits at a corner, it may happen that a three dimensional-triangular wedge separates from the building following a shear path. This study aims to predict the width and the depth of the wedge using a trial and error procedure. Employing principles of structural mechanics, the driving and resisting forces on the failure surface are compared. Results obtained indicate that it is possible to predict a failure path. However, the problem is subject to many variables, ranging from the material properties to the dimensions of the building. Therefore, an experimental investigation would help to validate the results. This research is of interest to structural engineers because it could provide an important contribution to the deeper understanding regarding the behavior of unreinforced masonry buildings.

OU1 Foundations of Fear: Student Perceptions of Crime and Safety

**Katherine Joyce**

At Gonzaga University, there is a belief among students that the Logan neighborhood surrounding campus is high in crime and is generally unsafe. What factors cause some students to fear crime more than others? My research seeks to answer this question, as well as gauge students' confidence in the criminal justice system and compare student support of "tough on crime" policies. Some of the variables considered are gender, class standing, political views, victimization history, and past experience with the criminal justice system. To conduct this research, a survey was administered to a sample of Gonzaga University students, totaling over 400 responses. These survey results were analyzed and compared to determine what factors affect feelings of safety and opinions on the criminal justice system. One goal with this research is to better understand both how college students perceive crime and safety and why they have these views. This research will uncover if people with a higher fear of crime are actually more likely to be victimized, or if this fear is unfounded. Identifying links to victimization will be useful for understanding crime trends and developing a realistic approach to safety education on and around Gonzaga's campus.

OU2 Japanese Americans and Mainline Christianity in Washington State During World War II

**Jedidiah Keating**

The central purpose of this research is to look at the Japanese American community and the Christian community in Washington State during World War II. It seeks to look at who were the chief groups calling for the internment of Japanese Americans and who were the key groups against the forced incarceration. Through the use of the primary sources, the paper wishes to show that Christian Americans were more prone to resist and cry out against the injustices enacted upon their countrymen, neighbors and friends, rather than more secular-minded Americans. Sources show that during this time the Christian community openly criticized and fought against the idea of internment and when it became a reality, it sought to assist as many as possible in finding new homes away from the West Coast. Though there were nonreligious individuals and groups that were against Japanese internment, the Christian community as a whole was more united on this issue and very adamant in opposing it and assisting Japanese Americans. The research wishes to expose the apparent lack of scholarship that exists on the subject of mainstream Christianity's dealings in this matter. The apparent focus on strictly secular examples is a common trend when discussing American resistance of internment, despite the elements that show an extreme trend of Christian churches and organizations being united against the idea and joining forces to support and assist Japanese Americans.

OU3 The Effectiveness of Visual Promotion Practices in Student On-Campus Advertising

**Dallas Nelson**

This project studies the effectiveness of visual devices used in on-campus posters created with the intent to attract the attention of students while walking to class. Using real and manipulated posters from the Whitworth Campus, I survey students to determine if the presence or absence of particular visual promotion tactics have a significant effect on how well students remember the content and purpose of the posters. Analysis of the resulting data shows which of the common visual promotion effects prove to be most effective when promoting to students on a college campus. The analysis will also enable me to compare promotional attributes that resonate with students, against best practices from the marketing literature. This research will help organizations, clubs, and departments better communicate events and information to students in a meaningful way.

OV1 The Mathematics of Twelve-Tone Music

**Tyler Stitt**

Twelve-tone music may at first seem like nothing more than a jumbled noise, but upon further examination it provides many opportunities for mathematical observation. Devised by Arnold Schoenberg, twelve-tone melodies follow a particular set of rules, using every single pitch of a chromatic scale in a given iteration of a musical idea. Some criticize the use of the twelve-tone structure as being inartistic and restrictive. This presentation will explore the implications of graph theory and combinatorics in twelve-tone music. Specifically, the focus will be on the possibilities that twelve-tone music allows, and if the twelve-tone structure is more artistically restrictive than conventional tonal structure.



OV2 Link Invariants on Klein Links

**Steven Beres, Rachael Kuhn, Hayley Olson**

A knot is a closed curve in three dimensions and a link is a set of potentially interlocking mathematical knots. Klein links form a group of links which may be embedded across the surface of a Klein bottle. That is, a Klein link is a link which may be drawn across the surface of a Klein bottle without intersection. This particular group of links has not yet been well studied by the mathematical community. ; Initially, our interest in these links stemmed from the relation between Klein knots and torus knots. It is a fairly well-known fact that all Klein knots are torus knots. After studying these links for some time, we discovered that unlike Klein knots it is not the case that all Klein links are torus links. ; This presentation will provide a brief discussion of the major results of our continued research on Klein links. In particular, we will consider link invariants such as linking number and how they pertain to Klein links.

OV3 Learning to "Read" a Jazz Solo: Dissecting the Language of Pat Metheny

**Denin Koch**

Much like a novelist, jazz musicians use simple ideas like "words" to construct artistic statements that is vastly more complex than the sum of the individual parts. By analyzing an improvised solo while looking for specific patterns, we can learn much about the improviser's approach to harmony, melody and rhythm. This session will examine the style of jazz guitar legend Pat Metheny and demonstrate a method of approaching jazz music.

OV4 Probabilistic Syllabification of English Words

**Maxwell Dulin, Jacob Krantz**

Syllables are the basic unit of speech consisting of one or more phones and are made from the combination of consonants and vowels. A syllable has no pause within it, and as such one or more may combine to form a word. The process of breaking words up into their corresponding syllables is called syllabification. Currently, the most widely used methods of syllabification are rule-based. Rule-based syllabifiers are based on Chomskyan linguistics, a popular strategy and set of principles for studying language. For many years, computational linguists have been using The National Institute of Standards and Technology (NIST) Syllabifier, based on English-written rules. In the last 20 years, developments in Artificial Intelligence involving probabilistic techniques have opened new doors for problem solving. Instead of applying the rules of a system, probabilistic techniques are trained on large datasets to discover patterns that have higher likelihoods of occurring within the system. Our approach to syllabification involves the use of a Hidden Markov Model (HMM). An HMM assigns a sequence of labels that are not observable; in this case syllable sequences to a sequence of items that are observable in this case words. We seek to determine if a probabilistic approach to syllabification can produce better results than a rule-based system. To do so, we compare our syllabifiers accuracy to that of the NIST Syllabifier.

OW1 Mental Illness in the Media

**Jennifer Douglas**

The portrayal of mental illness in the media is one that is violent, mad, unfavorable, and unpleasant. Across all previous research, the mentally ill are depicted in a negative way that is stigmatizing to the population as a whole and gives nondisabled persons a bad attitude and incorrect lens through which they view mental illness. This is an issue that desperately needs to be addressed because the problem will not go away on its own. I suggest that through recommendations to the media through advocacy groups, our society can give more responsibility to the entertainment industry in their representation of the mentally ill. This problem also calls for a change in the healthcare system if healthcare for mental illness is made better, this could lead to a change within the media as well.

OW2 "Treat with Reassurance": A Feminist Critique of the discourse regarding contraception in OB/GYN textbooks

**Annica Balentine**

Women are caught between a rock and a hard place when it comes to their reproduction. Women who choose the hard place, contraception, subject their bodies to synthetic hormones or foreign implants, the risks of which can include, but are not limited to, nausea, weight gain, deep vein thrombosis, mineral bone loss, and cardiac issues. Women who do not choose to use contraception are likely to end up with the rock, pregnancy. Sometimes, women who initially choose the hard place still end up with the rock, as half of all pregnancies in the United States carried to term were unplanned. Half of these pregnancies occurred to women currently using a method of contraception and the other half occurred to women who stopped using contraception because of the aforementioned risks and side effects. In spite of these clear issues with contraception, the American College of Obstetrics and Gynecology advocates for reducing the number of unintended pregnancies through widespread contraceptive use. This research illuminates the gendered risk discourse in OB/GYN textbooks that posits pregnancy as the ultimate health risk against which the costs and benefits of contraceptives are weighed. This rationale equates the efficacy of contraception with its safety, which diminishes the importance of other risks and side effects. In accord with modern risk societies, in which individuals assume the sole responsibility for negotiating, this discourse also shifts the responsibility for management of their inherently risky, fertile bodies to women themselves.

OW3 The Rise of Supermarkets in Chile and the Marginalization of the Mapuche people (1970s-2000s)

**Anne Marie Noll**

In a sense, supermarkets represent the highest expression of neoliberal capitalist globalization through their connection to transnational agribusiness and transnational companies. The rapid rise of supermarkets at the end of the twentieth century in Chile was the result of the transition from Import Substitution Industrialization (ISI) to the neoliberal economic policies that Augusto Pinochet's rise to power ushered in and the 1990s democratic government perpetuated. The industrial agro-food system, in which supermarkets rely, has caused mass land concentration and has caused many small farmers to be unable to compete leading to mass urbanization in developing regions, including

Chile. Many rural Mapuche, an indigenous group in southern Chile, traditionally small farmers, have been forced to migrate to urban centers leading to a more sedentary life style and urban food reliance. Urbanization and spread of supermarkets to rural areas has led to the rapid transition from a traditional diet to one that is more reliant on industrial foods. This has contributed to a loss of cultural identity and marked health issues associated with industrial foods.;

OW4 Coping and chemicals- Student stress and the Phenomena of "Self-medication"

**Callan Radnovich**

In college, students often find themselves feeling drained, overwhelmed, and stressed out. My study firstly confronts the sources of this stress, and how major, age, and political affiliation, among other variables, affects student's stress levels. Secondly, my study examines the use of substances including caffeine, alcohol, and cannabis. Instead of focusing on the rates of substance use alone, my study looks into two possible motivators for their use- either for stress management or as an academic aid. I call this phenomenon of substance use explicitly for these purposes "Self-Medication." I will show various comparisons of measures of stress and how it may correlate with self-medication. I will present the amount of stress experienced by Gonzaga Students, top contributors to student stress and differences in stress reported over time. I also will explore respondents perceived importance of both doing well in classes and taking demanding classes and how it may relate to their stress levels. Then, I will address the most popular substances on campus, their rates of use, the relationship between amount of stress and substance use, and the relationship between source of stress and drug use.

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An, Ilynn – S108, *Gonzaga University*  
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