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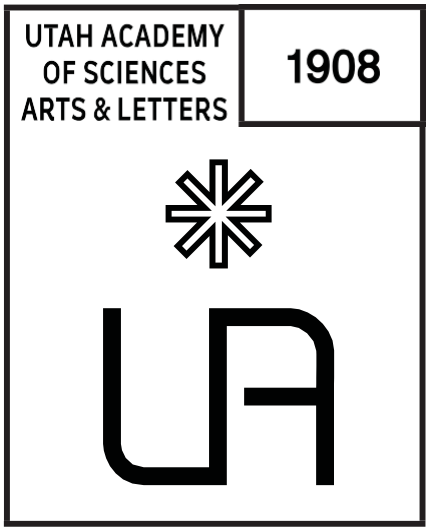

UTAH ACADEMY
of
Sciences, Arts & Letters

Established 1908

Annual Conference

March 13, 2020

University of Utah

UTAH ACADEMY OF SCIENCES, ARTS, & LETTERS

Annual Conference – Friday, March 13, 2020

9:00 a.m. – 10:00 a.m.

Check-in & Registration

Outside the William R. & Erlyn J. Gould Auditorium, J. Willard Marriott Library

10:00 a.m. – 10:05 a.m. – Rachel Keller, President

University of Utah Welcome: Dean Peter Trapa

William R. & Erlyn J. Gould Auditorium, J. Willard Marriott Library

10:15 a.m. – 10:30 a.m. – Erin O'Brien

William R. & Erlyn J. Gould Auditorium, J. Willard Marriott Library

Distinguished Service Award Presentation

Gloria M. Prahl, Utah Chapter of AAUW

John and Olga Gardner Prize Presentation

Dr. Alan L. Titus, Paleontologist

10:30 a.m. – 11:15 a.m.

O.C. Tanner Lecture

Dr. Alan L. Titus

William R. & Erlyn J. Gould Auditorium, J. Willard Marriott Library

11:15 a.m. – 11:30 a.m.

Conference Photo

Meet on the stairs by the west entrance

11:30 a.m. – 12:00 p.m.

Poster Session

Faculty Center

12:00 p.m. – 1:00 p.m.

Lunch

Ray Olpin University Union – BR-Center

1:15 p.m. – 2:30 p.m.

Division Breakout Session

See "Division Session Room Assignments"

2:30 p.m. – 3:00 p.m.

Refreshment Break

Outside Room 1140

3:00 p.m. – 4:00 p.m.

Division Breakout Session

See "Division Session Room Assignments"

4:00 p.m. – 5:00 p.m.

UASAL Board Meeting

Room to be assigned

Division Sessions

Room Assignments

POSTER SESSION:
Faculty Center

ARTS:
Session: 1140

BIOLOGICAL:
Session: 1170

BUSINESS:
Session IA: 1110
Session IB: 1120

EDUCATION:
Session: 2008

ENGINEERING:
Session IA: 1735
Session IB: 1745

KINESIOLOGY AND HEALTH SCIENCES:
Session: 2130N Hoopes

LANGUAGE & LITERATURE:
Session: 1008

PHYSICAL SCIENCES:
Session IA: 1130
Session IB: 1150

SOCIAL SCIENCES:
Session IA: 1715
Session IB: 1725

To Access Wireless Internet:

1. Please use “eduroam” wireless network to connect to the Internet.
2. Enter your university credentials for the username and password.
3. If your school does not participate in eduroam, use “guest”.
4. The log on and password will be provided at the conference.

Spring Excursion: More information to come.

Distinguished Service Award

Gloria M. Prahl

The Distinguished Service Award is given in recognition of exceptional service to the higher education community in Utah.

Gloria Prahl was raised on a small farm east of Flint, Michigan along with her three sisters. She started her education in a two-room, country school and, by the end of kindergarten, had decided that she would be a teacher when she grew up. After high school, she was offered a full scholarship to Central Michigan University (CMU), but her parents would not allow her to go. She ended up attending a two-year college and continued to work on the family farm.

After two years of college, she was invited to join a CMU education program and, in spite of her parents' objections, she moved to Flint and started her career as an educator. This leap of faith was made possible only because of the help of her friends -including her future husband. With their support, it still took a total of five years before she graduated. Just getting to that point inspired her to eventually work to help other women follow their career dreams.

Gloria and her husband retired in 1993 and moved to southern Utah. She joined the American Association of University Women in 1994 and ultimately served as the President of the St. George branch for six years and the state-level treasurer. Under Gloria's leadership, the St George branch grew to be the largest in Utah and they created a scholarship fund to help local women attend college, raising tens of thousands of dollars annually. In 2010, Gloria continued to lead the group as they created the eSMART Summer Camp to help local girls explore careers in Science, Technology, Engineering, and Math (STEM) -camp she ran for four years. Both the scholarships and camp were designed to help support local girls and women pursue futures in higher education in a community where women are still less likely to attend college or major in a STEM field compared to the rest of the nation.

In all of these efforts, her husband has been her greatest supporter -from going to college to helping other women get there. Gloria stepped down from running camp to care for him until he passed away in 2015.

She currently splits her time between Utah and Michigan where she still has family, including her son. In her free time she plays and teaches bridge, weaves, sews, volunteers with archaeologists and at a local community theater, runs a small community gym, and has recently returned to lead a group at AAUW, St. George focused on local, state, and federal policies that impact girls and women.

John & Olga Gardner Prize

Dr. Alan L. Titus

The Gardner Prize is awarded annually for exceptional achievement by an academic professional in Utah.

Dr. Alan Titus has worked as the monument paleontologist at Grand Staircase-Escalante National Monument for the last 20 years. He was the first full-time permanent paleontologist hired after the Monument's creation and has overseen the entire Kaiparowits Basin megafaunal renaissance. In 2013, he was honored with the naming of the horned dinosaur *Nasutoceratops titusi* in recognition of his contributions to the region's paleontology. He administers permits, coordinates and conducts research, manages partnerships with universities and museums across the country, runs the paleontology lab, conducts field surveys and excavations, and conducts much public outreach such as lectures, tours, articles, books, etc.

His current research interests include magnetic stratigraphy, marine reptiles, ammonite diversity, history of a multi-individual tyrannosaur bonebed, dinosaur thermo-regulation, and the classification of early hadrosaur-like dinosaurs.

Originally from Nevada, Titus has lived in Kanab for the last 16 years, where he enjoys hiking, skiing, mountain biking, and playing guitar in a classic rock cover band (named Mesozoic of course), when not out looking for fossils.

O.C. Tanner Lecture

"In the Land of Rainbows and Unicorns: Forensic Science of a 76-million-year-old Tyrannosaur Mass Mortality"

Dr. Alan L. Titus

Tyrannosaurids, including the mega-celebrity *Tyrannosaurus rex*, one of the largest terrestrial carnivores of all time, dominated the Northern Hemisphere during the Late Cretaceous (66-100 Ma). Rare tyrannosaur mass mortality sites in both east Asia and North America have been used as arguments that they were social animals, possibly grouped into cooperative packs. Site 14UTKA-8, inside Grand Staircase-Escalante N.M., also known as the Rainbows and Unicorns Quarry, has yielded the remains of at least four individuals of the advanced tyrannosaurine *Teratophoneus curriei* buried in close proximity. Examination of the geological, faunal, stable isotope, taphonomic, and charcoal evidence at the site appears to confirm the tyrannosaurs died as a group in a catastrophic single event, rather than through some attritional process like a predator trap. As a result, some level of social behavior can be inferred for *T. curriei*, a species much more closely related to *T.-rex* than any from previously documented sites.

Journal of the Utah Academy Publication Policy

The Journal of the Utah Academy of Sciences, Arts, and Letters publishes works in all of the fields of study encompassed in the Academy's mission. Papers published in The Journal of the Utah Academy of Sciences, Arts, and Letters are drawn from papers presented by members in good standing at the annual conference of the Utah Academy. The Journal of the Utah Academy is a refereed journal. To qualify for publication, the papers must be recommended through a refereeing system.

Presenters are encouraged to publish their paper in The Journal of the Utah Academy. The Journal's criteria are that a submission is (1) fresh, meaningful scholarly insight on its subject; (2) readable and well written; and (3) of general interest for an academic readership beyond the author's field.

If you wish your paper to be considered for publication in The Journal, please submit a Microsoft Word document to the chair of the appropriate division by June 1st, 2020. Contact information for division chairs is available on the Utah Academy's website (www.utahacademy.org). Editorial responses will be forthcoming after the resumption of school the following fall when referees have returned their comments to the division chairs.

Papers should be between ten and twenty double-spaced pages. Detailed instructions to authors are available at http://www.utahacademy.org/.

Poster Presentations

Poster Session

Division Chair: Jacque Westover
Utah Valley University

Session Leader: Jacque Westover

Biological Sciences

Title:	Undergraduate Student Research Conducting DNA Extraction, Sequencing and Assessing Quality from Angiosperm and Gymnosperm Herbarium Specimens
Author:	Ethan M. Rosati
Affiliation:	Utah Valley University

Title:	Prevalence of *Batrachochytrium dendrobatidis* in *Hyla arenicolor* in Washington County, Utah
Authors:	Dagny Hunt, Seth Collins, Dr. Curt Walker
Affiliation:	Dixie State University

Title:	Determining the physiological and morphological effects of nutrient removal on *Brassica rapa*
Authors:	Heather Moon, Sarah van Dijk,
Affiliation:	Utah Valley University

Title:	How Do Endophyte Communities Change in *Juniperus osteoperma* Tissue after Wildfire?
Authors:	Reagan Dodge, Mackenzie Jones, Nick Owen, Sam Smalley
Affiliation:	Utah Valley University

Title:	Evolution of Wood Warbler (Parulidae) Song
Authors:	Sierra White, Marggie Glenn, Nicolas Gasparro, Jungyun Huh, and Rachel Bolus
Affiliation:	Southern Utah University

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Title:	Can Little Changes Kill You? Using Great Salt Lake Brine Shrimp to Examine Developmental Mortality
Authors:	Hannah Adams, Tanner Allgaier, Ashleigh Jackson, Jonathan Wasden, Paul Dunn
Affiliation:	Utah Valley University

Title:	The impacts of cannabis use on medical conditions, drug use, and financial/academic success
Authors:	Tyler M. Hacking, Alex Johnson, Meshel Patten
Affiliation:	Utah Valley University

Title:	Perceptions of GMO vs. Organic Foods among Different Education Levels & Backgrounds
Authors:	Mackenzie Jones, Nanasi Sekona, Miles Beck, Matthew Olsen
Affiliation:	Utah Valley University

Title:	Differences in salt tolerance of *Spinacia oleracea* when inoculated with fungi from the rhizosphere of *Atriplex canescens*
Authors:	Ethan Darby, Aubrie Bogle, Steven Kelty, Dasha Horton
Affiliation:	Utah Valley University

Title: Perception Analysis of CBD at Utah Valley University
Authors: Michael Lacerda, Matthew Carter, Christopher Gowans, Kaina Payan
Affiliation: Utah Valley University

Title: Predicting the presence of *Juniperus osteosperma* using niche modeling techniques at the Three Peaks Recreational Area
Authors: Justin D. Mickelson, Rachel T. Bolus & R. Matthew Ogburn
Affiliation: Southern Utah University

Title: Exploring the Synergistic Effects of Vancomycin and Electrohydraulic Shockwaves against *Staphylococcus aureus* Biofilms
Authors: Ashley Roach Escarate, Bryce Brunetti
Affiliation: Utah Valley University

Title: Identifying Conservation Needs of Dwarf Bear-Claw Poppy Populations
Author: Spencer Douglas Thatcher
Affiliation: Dixie State University

Education

Title: Tracking Professional Development through the Creation of Culturally-appropriate Educational Materials
Authors: David R. Byrd, DeeDee Mower, Pené Stewart, Richard Fry, Nadia Wrosch
Affiliation: Weber State University

Physical Sciences

Title: Synthesis of Halohydrins by Epoxide Ring Opening
Authors: Sydney L. Rowley, Nathan S. Werner
Affiliation: Southern Utah University

Title: Reactivity of B-Keto Radicals with Halogens
Authors: Garett Ruesch, Nathan Werner
Affiliation: Southern Utah University

Title: Methylene Blue Derivatives as Potential Photosensitizers in Photodynamic Therapy.
Authors: Jeffrey Brenton Bushnell, Jacob Dean
Affiliation: Southern Utah University

Title: Isomerization of (E)- β-Bromostyrene
Authors: Trace Wilson, Nathan S. Werner
Affiliation: Southern Utah University

Title: Exploring the Behavior of Bilin Subunit N-Methyl-Dipyrrinone Upon Photon
Authors: Taime Clark, Jacob Dean
Affiliation: Southern Utah University

Title: Fourier Analysis of Ultrasound Signals for Identification of Scatterer Diameter in Agarose Microbead Phantoms
Authors: Brandon Jolley, Alex Johnson, Whitney Parry, Olivia Johnson, McKenna Parr, Clayton Rawson, Tyson Hoyt, Vern Hart
Affiliation: Utah Valley University

Social Sciences

Title: Scouting Friends Will Always Be: Communities in the Boy Scouts of America
Author: Amanda McFarlane
Affiliation: Brigham Young University

Title: How Do You Like Your Eggs?
Authors: Aubrielle Atkinson, Sarah Applegarth, Kole Graper, Teran Sorensen
Affiliation: Snow College

Title: What makes you jump: Can a brief auditory and visual stressor cause a measurable stress response?
Authors: Maren Payne, Claudia Jorgensen, Tyler Barton, Peter Williams, June Perez, Mandie Stephen, Jessi Hill
Affiliation: Utah Valley University

Title: Observing Healthy Progression in Relationships Throughout Generations
Authors: Avery Whitaker, Haleigh Chester, Jackson Bird, Kiersten Strat, Kloie Park
Affiliation: Snow College

Title: "Selfie" Self-Esteem
Authors: Hayley Hightower, Sarah Chipman, Adeline Frank, Quincy Kunz, Abigail Spackman, Danielle Noorda
Affiliation: Snow College

Title: Reflexive and Sustained Attention: Identifying Individual Variability in Children
Authors: Brian Farstead, Williford, Tanner; Schow, Hunter; Muldowney, John; Stewart, Victoria
Affiliation: Brigham Young University-Provo

Title: The Role of Parental Control on Childhood Anxiety
Authors: Natalie Merrill, Jennifer Shubert
Affiliation: Utah Valley University

Oral Presentations

Arts

Division Chair: Angela Banchero-Kelleher
Utah Valley University

Session Leader: Angela Banchero-Kelleher

1:00 p.m. Title: Ballet and Bonaparte: Understanding Napoleon Bonaparte's Lasting Influence on the Art of Dance
Author: Golda Dopp
Affiliation: Utah Valley University

1:15 p.m. Title: Classical Persian Art: Toward an Ecological Perspective
Author: Barry Wood
Affiliation: Dixie State University

1:30 p.m. Title: Switching Channels: Information Theory and the Rise of Contemporary Art
Author: Travis Lee Clark
Affiliation: Utah Valley University, Department of Art and Design

1:45 p.m. Title: The Holocaust, Sigmund Freud, and Anna Sokolow
Author: Cassidy Blackham
Affiliation: Utah Valley University

2:00 p.m. Title: "Healing Trauma: Exploring a More Just Future & Working Towards Joy Through Artmaking"
Author: Audrey Reeves
Affiliation: Utah Valley University

2:30 p.m. Refreshment Break – Outside Room 1140

Biological Sciences

Division Chair: Daniel Clark
Weber State University

Session Leader: Daniel Clark

1:00 p.m. Title: Structural Characterization of Junctional Adhesion Molecules
Authors: Christopher Mendoza, Dario Mizrachi
Affiliation: Brigham Young University

1:15 p.m. Title: The effect of urbanization on genetic diversity in southern Utah ant populations
Authors: Johanna Garavito, Glade Shakespeare
Affiliation: Southern Utah University

1:30 p.m. Title: An analysis of ITS1 in two *Equisetum* subgenera: Secondary structure and non-metric multidimensional scaling
Author: William D. Speer
Affiliation: Salt Lake Community College

1:45 p.m. Title: Gluconate metabolism by *Lactobacillus wasatchensis* is another risk factor for late gas production in aging cheese
Authors: Kate Sorensen, Craig Oberg, Matthew Domek, Michele Culumber, Donald McMahon
Affiliation: Weber State University, Utah State University

2:00 p.m. Title: Fermentation of Plant-based Extracts by Dairy Lactic Acid Bacteria
Authors: June Smith, Niharika Mishra, Craig Oberg, Michele Culumber
Affiliation: Weber State University

2:15 p.m. Title: Microbial Load Reduction in Athletic Locker Rooms Using Ozone Treatment
Authors: Xavier Stilson, Kawika Tupuola, Clark Madsen, Craig Oberg
Affiliation: Weber State University

2:30 p.m. Break - Outside Room 1140

3:00 p.m. Title: Can Automatic Hand Dryers Serve as a Microbial Reservoir for Contamination?
Authors: Riley Nichols, Hyrum Packard, Craig Oberg, Matthew Domek, Michele Culumber
Affiliation: Weber State University

3:15 p.m. Title: A Comparison of the Perceptions of Genetically Modified Organisms among Differing Religious Beliefs and Educational Backgrounds
Authors: Shane Gunnerson, Blake Johnson, Rylaan Marlowe
Affiliation: Utah Valley University

3:30 p.m. Title: Reduction of human cytotoxicity by the brain-eating amoeba *Naegleria fowleri* due to drug and complement inhibition
Authors: Joshua O. Gee, Daniel N. Clark
Affiliation: Weber State University

Business

Division Chair: Taowen Le
Weber State University

SESSION IA
Session Leader: Taowen Le

1:00 p.m. Welcome

1:20 p.m. Title: A Pedagogical Model for Teaching Data Analytics in an Introductory Information Systems Python Course
Authors: Heber C. Brau, Mark Keith
Affiliation: Brigham Young University

1:40 p.m. Title: Plugged-In: Rural Readiness for Technology Industry
Authors: Hayden Johnson, Laurie Harris
Affiliation: Southern Utah University

2:00 p.m. Title: The Impact of Video Games on College Academic Performance: An Empirical Analysis of an Introduction to Information Systems Class

Authors: Heber C. Brau, Finnegan McKinley, James C. Brau, James Gaskin
Affiliation: Brigham Young University

2:20 p.m. Title: Utah State Capital Resource Allocation: A Proposal for Increasing the Transparency of Capital Expenditures, Including Facilities
Authors: Nathan G Caplin, R. Neil Walter
Affiliation: Snow College

2:40 p.m. Title: Teaching Python Data Analytics Through External Object-Oriented Game Design
Author: Heber C. Brau
Affiliation: Brigham Young University

3:00 p.m. Title: Attitudes and Perceptions of White Collar and Street Crime
Authors: Jill O. Jasperson, Ronald M. Miller, Thomas Dearden
Affiliation: Utah Valley University; Virginia Tech

3:20 p.m. Title: Modeling and Predicting the Underpricing of Initial Public Offerings using Machine Learning Algorithms
Authors: Noah T. Brown, James C. Brau, Craig Thorsen
Affiliation: Brigham Young University

3:40 p.m. Title: Business Ethics Education in Utah: How Are We Teaching Ethics and Why?
Authors: Chelsea M Dye, Charlotta Farr, Dara Hoffa, Ron Mano
Affiliation: Westminster College

SESSION IB
Session Leader: Jonathan Westover

1:00 p.m. Welcome

1:20 p.m. Title: The State Treasurer Needs an Intermediate Maturity Fund: A Discussion of Investment Options Needed to Compliment the PTIF
Authors: R. Neil Walter, Nathan Caplin
Affiliation: Snow College

1:40 p.m. Title: Earnings Management Surrounding Seasoned Equity Offerings: A New Method for Measuring Abnormal Accruals
Authors: Paige Perkins, James C. Brau
Affiliation: Brigham Young University

2:00 p.m. Title: Integrating Scrum Methodology Principles into Undergraduate Marketing Course Design
Authors: Nelson Altamirano, Benjamin Hart
Affiliation: LDS Business College

2:20 p.m. Title: An Econometric Analysis of Diversity: Perceptions of Undergraduate College Students towards Corporate Social Responsibility Metrics
Authors: Finnegan McKinley, James C. Brau
Affiliation: Brigham Young University

2:40 p.m. Title: Did Global Financial Crisis have Impact on Credit Unions Risk

Performances? Evidence from Utah
Authors: Abdus Samad, Duncan Chritensen
Affiliation: Utah Valley University

3:00 p.m. Title: An Empirical Examination of the Marketing of Initial Public Offerings
Authors: Whitney Holman, James C. Brau
Affiliation: Brigham Young University

3:20 p.m. Title: Work-Life-Balance Characteristics as a Predictor of Job Satisfaction across Generations
Authors: Danielle Hardy, Annie Arvizu, Jace Johnson, Spencer Powell, Jonathan Westover
Affiliation: Utah Valley University

3:40 p.m. Title: The Effect of State Disclosure Status on Housing Markets
Authors: Spencer Evans, Barrett Slade
Affiliation: Brigham Young University

Education

Division Chair Nicole Gearing
Utah Valley University

Session Leader: Nicole Gearing

1:00 p.m. Title: Networks of Solidarity in College Housing for Indigenous Youth
Author: Elhom Gosink
Affiliation: Westminster College

1:20 p.m. Title: Facilitating Engaged Student Learning: Seven Principles for Instruction in Undergraduate Marketing Courses
Author: Benjamin Hart
Affiliation: LDS Business College

1:40 p.m. Title: Creating a Successful Secondary Dance Program in Any Community
Author: Nichole Ortega
Affiliation: Utah Valley University

2:00 p.m. Title: A Comparison of Experiential Project and Learning Outcomes for students in an Online Organizational Development and Change Course
Author: Jonathan Westover
Affiliation: Utah Valley University

2:30 p.m. Refreshment Break - Outside Room 1140

3:00 p.m. Title: Greater Rudeness: Interruptive Behavior in the Graduate School Classroom
Author: Thomas C. Terry
Affiliation: Utah State University

3:20 p.m. Title: From Start to Finish: The Implementation of Campus-Wide Integrative Training and Programs
Author: Lianna Manibog
Affiliation: Snow College

Engineering

Division Chair: Ali Siahpush
Southern Utah University

SESSION IA
Session Leader: Ali S. Siahpush

1:00 p.m. Welcome

1:15 p.m. Title: Heat Transfer Analysis of Water During Liquid-Solid Phase Change
Authors: Kelly Lou Pelicano, Colton Robinson
Affiliation: Southern Utah University

1:30 p.m. Title: Mechanical and Thermal Properties of Concrete
Authors: Craig Olson, Nathan Tyler
Affiliation: Southern Utah University

1:45 p.m. Title: Analytical Solutions to Predict the Thermal Conductivity of a Phase Change Material in a Cylindrical Coordinate System
Authors: Kelly Lou Pelicano, Emmanuel Navarro
Affiliation: Southern Utah University

2:00 p.m. Title: Analytical Solutions for Inward Solidification of a Phase Change Material In a Cylindrical Coordinate System
Authors: Kelly Lou, Pelicano, Emmanuel Navarro, Vicki Krull, Ali Siahpush
Affiliation: Southern Utah University

2:15 p.m. Title: Heat Transfer Analysis of Water During Liquid-Solid Phase Change
Authors: Colton Robinson, and Kelly Pelicano
Affiliation: Southern Utah University

2:30 p.m. Refreshment Break - Outside Room 1140

SESSION IB
Session Leader: TBA

1:00 p.m. Welcome

1:15 p.m. Title: Material Properties of Photopolymer Resin, Polylactic Acid, And Other 3d Printing Materials
Authors: Austin Rohrer, Teigen Jewkes, Zach Jensen, Jacob Pastorik
Affiliation: Southern Utah University

1:30 p.m. Title: Tensile Properties and Thermal Conductivity of Fused Polylactic Acid Polymers
Authors: Anthony Cole, Aaron Dockins, Kyler Reinhold, Austin Banks, Ali Siahpush
Affiliation: Southern Utah University

1:45 p.m. Title: Thermoelectric Devices: A study of material-based efficiency and operation
Authors: Spencer Bain, Ryan Dungan, Nate Hirst, Kaiyuan Sun
Affiliation: Southern Utah University

2:00 p.m. Title: Experimentally Evaluating Solar Flux and Absorptivity of a Plate through Radiation Heat Transfer
Authors: Landen Measom, John Webster, Inoa Wahinehookae, Chris Zeman
Affiliation: Southern Utah University

2:15 p.m. Title: Applications of Knowledge Management in Construction Companies to Improve the Performance Indicators
Authors: Mohamed Askar, Mason Timmerman, Bryant Ward
Affiliation: Southern Utah University

2:30 p.m. Refreshment Break - Outside Room 1140

3:00 p.m. Title: Problems Facing Parties Involved in BOT/PPP Projects in the USA - Case Study: Cedar City, Utah
Authors: Mohamed Askar, Jared Baker; Gray Christian; Tyler Ercanbrack
Affiliation: Southern Utah University

Kinesiology and Health Sciences

Division Chair: L. Nathan Thomas
Salt Lake Community College

Session Leader: L. Nathan Thomas

2:30 p.m. Refreshment Break - Outside Room 1140

3:00 p.m. Title: Intermittent Fasting as an Alternate Method of Fat Loss: Altering Body Composition in Competitive Physique Athletes
Author: Kasey Giles
Affiliation: Brigham Young University

Title: Factors that Increase the Effectiveness of Active Rehabilitation in the Treatment of Post-concussion Symptoms: A Review
Author: Alexa Katrena Bowns
Affiliation: Brigham Young University

3:15 p.m. Title: The Relationship between Physical Activity and Smokeless Tobacco Use among Adults in the United States: A Systematic Review of the Literature
Author: Yan Huang
Affiliation: Weber State University

3:30 p.m. Title: Serotonergic Hallucinogens' Antidepressant Potential: A Comparative Review of Serotonergic Hallucinogens and Ketamine
Author: Ethan Ouzts
Affiliation: Brigham Young University

3:40 p.m. Title: Lactate Threshold Analysis: Statistical and Practical Analysis; Pilot Study
Author: L Nathan Thomas, Kylie Cox, Angee Thomson, Teresa Taylor, Miliena Mitre, Jenny Pham
Affiliation: Salt Lake Community College

Letters, Language, & Literature

Division Chair: Keith Lawrence
Brigham Young University

Session Leader: Rachel Keller

1:00 p.m. Title: Poetic Shape: How Enjambment in Gwendolyn Brooks "We Real Cool" Evokes Visual Metaphor and Deeper Meaning
Author: Megan Alyse
Affiliation: Weber State University

1:15 p.m. Title: Lab Lit: What Happens to Character When Contemporary Science and Literature Cross Paths?
Author: Olga Pilkington
Affiliation: Dixie State University

Creative Fiction

Session Leader: Rachel Keller

1:30 p.m. Creative Fiction
Title: Address Trauma Through the Surreal Fictions
Affiliation: Brigham Young University
Four readers will read short pieces fiction in which magical realism as a means of examining how people respond to trauma, pain and grief.

Reader: Lisa Christensen
"Moths of a Feather," a short story about tattoos and friendship beyond the grave

Reader: Dallin Hunt
"Cheating," a series of flash fictions where death doesn't win.

Reader: Chanel Earl
"One Boy's Death," a ghost story featuring multi-generational connections and lighting.
Reader: Madalyn McRae
"The Corpse's New Clothes," in which an obsessive distance runner finds an unusual trainer.

2:30 p.m. Refreshment Break - Outside Room 1140

3:00 p.m. Creative Fiction
Title: The Truth of Beauty and the Beauty in Truth
Affiliation: Brigham Young University
Three readers will share original creative nonfiction and poetry employing lyrical memoir and quasi-confessional modes to explore how these sister genres explore and generate beauty in truth.

Reader: Kalli Abbott
"On Fishing," a nonfiction essay

Reader: Carma Hilland
"Nuclear Folly," a nonfiction essay

Reader: Thew Curtis
From "Epistolary Poems"

4:00 p.m. Conclude

Physical Sciences

Division Chair: Chris Monson
Southern Utah University

SESSION IA:
Session Leader: Chris Monson

1:00 p.m. Title: Using Silver Nanoparticles to Detect Early Onset of Disease
Authors: Porter Wilkes, Payton Riggs, Hayley Phillips, Jonah Babbel, Payden Harrah, Christopher F. Monson
Affiliation: Southern Utah University

1:20 p.m. Title: Lead levels in the wing bones of Utah eagles, measured by x-ray fluorescence
Author: Michelle Arnold
Affiliation: Weber State University

1:40 p.m. Title: A Microfluidic Device for Oxygen Quantitation in Anoxic Environments
Authors: Mariah Clayson, Madison Evans, Christopher Abraham
Affiliation: Southern Utah University

2:00 p.m. Title: Biological Molecules - Separation by Charge and Microfluidic Devices
Author: Ruthie Cicotte
Affiliation: Southern Utah University

2:30 p.m. Refreshment Break – Outside Room 1140

3:00 p.m. Title: Ultrafast laser spectroscopy probes of macromolecules and their solvent environment at electrified solid-liquid interfaces
Authors: Rodrigo Noriega, Sasha A. Moonitz, Noah Shepard
Affiliation: University of Utah

3:20 p.m. Title: Low temperature deviations from Arrhenius behavior of Kinesin-1
Authors: Flo Doval, Kassandra M Ori-McKenney, Richard J McKenney, Michael Vershinin
Affiliation: University of Utah

3:40 p.m. Title: Investigation into the dynamics of lipid membrane remodeling
Authors: Abhimanyu (Abhi) Sharma, Henry Nguyen, Nathaniel Talledge, John McCullough, Frank Moss III, Janet Iwasa, Michael Vershinin, Wesley Sundquist, Adam Frost
Affiliation: Physics & Astronomy University of Utah, Biochemistry & Biophysics University of California San Francisco, Biochemistry University of Utah

4:00 p.m. Conclude

SESSION IB:
Session Leader: TBA

1:00 p.m. Title: Continuous Trajectories in the Quantum Harmonic Oscillator

Authors: Matthew Lawyer, Jean-Francois Van Huele
Affiliation: Brigham Young University

1:20 p.m. Title: Designing a Universal Quantum Logic Gate: Deutsch Gate Circuitry with Two Quantum Dots and a Flying Qubit
Author: Paul Bailey
Affiliation: Brigham Young University

1:40 p.m. Title: Robustness of a quantum algorithm in the presence of noise
Authors: Scott Johnstun, Jean-Francois Van Huele
Affiliation: Brigham Young University

2:00 p.m. Title: Developing Selective Absorbers for Solar Water Heating; Undergraduate Materials Research at Weber State
Authors: Kristin Rabosky, Colin Inglefield, Corey Collatz
Affiliation: Physics Department, Weber State University

2:30 p.m. Refreshment Break - Outside Room 1140

3:00 p.m. Title: Concentration Variation of Reagents on Silver Nanoparticle Production via a Microfluidic Device
Authors: Cade Christensen, Brittany Christensen
Affiliation: Southern Utah University

3:20 p.m. Title: Solvatochromic Properties of Novel Molecules Structurally Related to Brooker's Merocyanine Dye
Authors: Jacob Newey, Kyler White, Mackay Steffensen
Affiliation: Southern Utah University

3:40 p.m. Title: Numerical and Stability Analysis of the Lengyel-Epstein and Brusselator Systems
Author: Parker Evans
Affiliation: Southern Utah University

4:00 p.m. Conclude

Social Sciences

Division Chair: Emily Putnam
Salt Lake Community College

SESSION IA:
Session Leader: Emily Putnam

1:00 p.m. Title: Title: "Ripple in Still Water": Psychedelic Rock Resistance
Author: Theresa A. Martinez
Affiliation: University of Utah

1:15 p.m. Title: Toxic Friendship Scale
Authors: Emily Arrington, Maya Howell, Avery Hansen, JD Myers
Affiliation: Snow College

1:30 p.m. Title: The Influence of Pressure on Decision Making
Authors: Shayla Howe, Charly Pace, Ryker Erickson, Demi Contreras

Affiliation: Snow College

1:45 p.m. Title: Can't Buy Me Friendship
Authors: Arielle Brooks, Rubie Hernandez, Zamera Male, Alexi Hernandez
Affiliation: Snow College

2:00 p.m. Title: Dismantling Speciesism through Ecofeminism
Author: Kiana Avlon
Affiliation: Westminster College

2:15 p.m. Q & A/Discussion

2:30 p.m. Refreshment Break - Outside Room 1140

3:00 p.m. Title: Climate Justice and the Human Rights of the Subaltern: A Dire Need for a Treaty
Author: Giancarlo Panagia
Affiliation: Westminster College

3:15 p.m. Title: Leadership: A Protean Institution of the Mind and of Civilization
Author: Pierce Bassett
Affiliation: Brigham Young University

3:30 p.m. Title: Has the World Failed Us? Social Sickness in Utah County
Author: Katherine Berrett
Affiliation: Brigham Young University

3:45 p.m. Q & A/Discussion

4:00 p.m. Conclude

SESSION IB
Session Leader: Dan Poole

1:00 p.m. Title: Understanding Us Programing
Author: Daniel Poole
Affiliation: Salt Lake Community College

1:15 p.m. Title: Peeking through the Palisade at Palmares: A Composite Social History
Author: Austin Nelsen
Affiliation: Weber State University

1:30 p.m. Title: A Longitudinal Test of Law Enforcement Officer Training to Prevent Citizen Suicide
Authors: R.C. Morris – Weber State University & Philip J. Osteen
Affiliation: Weber State University, University of Utah

1:45 p.m. Title: Article 9: Japan's Constitutional Conundrum
Author: Sasha Woffinden
Affiliation: Brigham Young University

2:00 p.m. Title: Blue Collar Workers' Perceptions of Queer Individuals
Author: Cameron Arnold

Affiliation: Southern Utah University

2:15 p.m. Q & A/Discussion

2:30 p.m. Refreshment Break - Outside Room 1140

3:00 p.m. Title: Housing and Autism Spectrum Disorder: Insights from Individuals and Families
Authors: Jonathan Westover, Maren Paulsen, Kari Bushman, Teresa Cardon
Affiliation: Utah Valley University

3:15 p.m. Title: The Use of Digital Folklore to Reduce Internalized Stigma Related to Civilian PTSD
Author: Geneva Harline
Affiliation: Salt Lake Community College

3:30 p.m. Canceled
Title: Utah's High Suicide Rate: What college students Say about the Causes
Author: Huiying Hill
Affiliation: Weber State University

3:45 p.m. Q & A/Discussion

4:00 p.m. Conclude

POSTER ABSTRACTS

BIOLOGY POSTERS

Title: Undergraduate Student Research Conducting DNA Extraction, Sequencing and Assessing Quality from Angiosperm and Gymnosperm Herbarium Specimens
Author: Ethan M. Rosati
Affiliation: Utah Valley University
Abstract: The goal of this project is to gather and collect the genetic information to lay the groundwork for future engaged learning opportunities. The DNA sequences collected will create a reference collection, building a valuable student resource for future phylogenetic work. DNA was collected from angiosperms and gymnosperms from exsiccate herbarium specimens, by way of destructive method of grinding. After material collection, DNA extraction kits were used, and isolates were evaluated for quality and quantity of extracted DNA. DNA was amplified via PCR, then PCR products were observed for quality and quantity though gel electrophoresis and nanodrop spectrophotometry. To investigate success in amplification of the target DNA sequence, the ITS region was sequenced. Geneious software was used to edit DNA sequence data and measure DNA sequencing quality. Ultimately the goal is to add our DNA sequencing data to the barcoding body of knowledge to help biologists have intellectual control, and to conserve and protect the biota of Utah and the world.

Title: Prevalence of *Batrachochytrium dendrobatidis* in *Hyla arenicolor* in Washington County, Utah
Authors: Dagny Hunt, Seth Collins, Curt Walker
Affiliation: Dixie State University
Abstract: Amphibian species worldwide have been faced with decline and extinction due to chytridiomycosis, a lethal infection caused by the fungus *Batrachochytrium dendrobatidis*. A small number of species have been found that do not experience detrimental effects following exposure to the fungus. One such species is *Hyla arenicolor*. It has been speculated that these frogs are capable of preventing infection by basking in the sun. Fluorescently labeled antibodies were used to determine the prevalence of chytrid in wild populations of *H. arenicolor* in Washington County, Utah and to diagnose captive specimens held at the optimal temperature range for *B. dendrobatidis* for six months without any symptoms of chytridiomycosis. An *ex vivo* assay using skin secretion samples was used to determine *H. arenicolor* immune response to *B. dendrobatidis*. The captive specimens were determined to be positive for *B. dendrobatidis* and the growth of *B. dendrobatidis* was

inhibited in the plates containing diffusion discs saturated in *H. arenicolor* skin secretions. These results may provide insight into the mechanism by which wild *H. arenicolor* survive the cooler months when infected.

Title: Determining the physiological and morphological effects of nutrient removal on *Brassica rapa*
Authors: Heather Moon, Sarah van Dijk
Affiliation: Utah Valley University
Abstract: Nutrient deficiencies have various effects on plant growth and health in different species. Depending on the nutrient deficiency, plants may exhibit unique physiological and morphological symptoms. Knowing the response in specific species is useful for farmers, since it enables them to discover and rectify a nutrient deficiency before the damage becomes permanent. They can also use the knowledge to adjust the nutrients and correct potential deficiencies that can affect the physiology of the plant. The purpose of this experiment is to observe the effects of isolated nutrient deficiencies in the species *Brassica rapa*. Evaluation in this species is important because various *B. rapa* subspecies are cultivated worldwide for oil and vegetable crops. The observed nutrients will be phosphorus (PO_4^{3-}), nitrogen (NO^{3-}), potassium (K^+), magnesium (Mg^{2+}), and iron (Fe^{2+}). Our objectives are to evaluate whether there is a difference among plant performance upon depletion of each nutrient and to determine how the depletion affects different physical and morphological traits of the plant, including the effect on roots, shoots, leaves, and flowers. *Brassica rapa* is a flowering plant with a 2- to 3-week growing cycle. We will first sterilize our seeds, and let them germinate in Petri dishes for 1–2 days. Following germination, seedlings will be transferred to styrofoam containers filled with vermiculite and then placed onto our watering systems. To test the effect of the various nutrients, watering treatments will be applied, each lacking a different nutrient and one with all the nutrients present. These will each be replicated four times with six plants in each replicate. Water treatments will stop after two weeks of growing, and we will evaluate water potential, size, and physical traits of the plants, including dry mass of shoots and roots.

Title: How Do Endophyte Communities Change in *Juniperus osteoperma* Tissue after Wildfire?
Authors: Reagan Dodge, Mackenzie Jones, Nick Owen, Sam Smalley
Affiliation: Utah Valley University
Abstract: *Juniperus* is a common woody genus endemic all over the West Coast with *Juniperus osteosperma* (common name Utah Juniper) found abundantly in the state of Utah. Junipers play key roles in pinyon–juniper forest complexes, which are commonly susceptible to wildfires. The aftermath of a wildfire appears devastating and desolate, but studies have shown that fungal communities help break down these large biomasses of charred plant life via decomposition and help replenish the soil by promoting microbiome formation in these areas. This plays a key role in regrowth after these events since plants rely on symbiotic relationships with bacteria and fungi to improve nutrient uptake, enhance pathogen resistance, and resist stress. Therefore, it is critical for those ecosystems first to rebuild their microbial community. These fungal communities typically start from endophytes, which may persist within the tissue of trees killed by fire. This study will assess the role of endophytes present in *J. osteosperma* wood samples in the aftermath of the aforementioned wildfire ecosystems, and how these fungal communities persist and change in dead tissue over time. We will be able to evaluate the impacts those fungal endophytes may have had on the physiology of their host and as members of a new soil microbiome.

Title: Evolution of Wood Warbler (Parulidae) Song
Authors: Sierra White, Marggie Glenn, Nicolas Gasparro, Jungyun Huh, and Rachel Bolus
Affiliation: Southern Utah University
Abstract: The Parulidae, or Wood Warblers, is a family of birds found in the Americas. The song behaviors vary among species, particularly in repertoire size (*i.e.*, how many unique song types each individual sings), the context in which different song types are sung, and whether one or both sexes sing. The variation in these traits could have been affected by variation in morphology (*i.e.*, beak size and mass), habitat, or migratory behavior. To test these relationships, we collected data on these characteristics from the literature and mapped them using a published phylogenetic tree of 107 species in this family (Lovette *et al*. 2010). We will also measure the frequency and modulation of archived songs using Raven bioacoustic software. Using these data, we will produce analyses to formulate and test new hypotheses on the evolution of song in this group and publish an updated review.

Title: Can Little Changes Kill You? Using Great Salt Lake Brine Shrimp to Examine Developmental Mortality
Authors: Hannah Adams, Tanner Allgaier, Ashleigh Jackson, Jonathan Wasden, Paul Dunn
Affiliation: Utah Valley University

Abstract: Many organisms exhibit a “bathtub” shaped mortality curve, with high but decreasing mortality risk early in life (ontogenescence), a bottoming-out around age of first reproduction, and then a gradual increase in mortality risk with age (senescence). The evolutionary implications of senescence have been studied extensively because of its direct implications for human health and society. Ontogenescence, however, has remained largely understudied despite its immense importance to all organisms that exhibit this life-history trait. The question that demands an evolutionary explanation is why ontogenescence would evolve in the first place since the disadvantages of dying before reproduction should be strongly selected against. One possible explanation is the Transitional Timing Hypothesis which claims that increases in mortality are associated with transitional events (e.g. hatching) and that the most dangerous of these events are concentrated early in life. Prior studies have shown links between increased mortality and the major transitions of an organism’s life cycle, such as hatching and metamorphosis of barnacles. The goal of this study is to look at the potential mortality risks of less drastic, but still necessary, transitions such as molting events in brine shrimp (*Artemia*). To accomplish this, individual brine shrimp were hatched from cysts and then monitored throughout their development until maturation. The timing of molts and deaths were recorded to look for links between timing of death and transitional stage. Pilot experiments for determining ideal culturing conditions that allow for the collection of individual-level data with this model species are ongoing.

Title: The impacts of cannabis use on medical conditions, drug use, and financial/academic success
Authors: Tyler M. Hacking, Alex Johnson, Meshel Patten
Affiliation: Utah Valley University
Abstract: Cannabis use is categorized into two types: medical and recreational. These are general terms used to describe the way it is used. The recreational user is classified as someone who uses cannabis outside of medical prescription. This however, could be inaccurate because some of these individuals could be in a location where the legislature does not allow medical cannabis use, or someone who does not have insurance, or someone who does not have a doctor who is willing or able to write a recommendation or prescription for cannabis use. Since animals seek out molecules that provide physical and mental medical treatments, perhaps, in reality, the recreational user is extremely rare. Is it possible that a majority of these recreational users are actually medicating themselves for untreated medical conditions? We aim to find correlations between recreational use of cannabis and pre-existing medical conditions, to determine if cannabis is a gateway drug toward or away from other drugs and financial/academic success. We will distribute anonymous surveys with questions targeted towards cannabis use and its intended purpose as well as potential consumers. The online survey responses will be collected anonymously via SurveyMonkey. The in-person surveys will be collected using a black box. This will ensure there will be complete anonymity when collecting data from informants.

Title: Perceptions of GMO vs. Organic Foods among Different Education Levels & Backgrounds
Authors: Mackenzie Jones, Nanasi Sekona, Miles Beck, Matthew Olsen
Affiliation: Utah Valley University
Abstract: Genetically modified organisms (GMOs) are defined by the USDA as any organism whose genome has been altered using any form of genetic engineering techniques. Modern-day agriculture has turned to using GMOs to increase crop yield and improve crop efficiency. This study examines the perceptions of participants with regards to genetically modified organisms as a food source compared to organically grown food. Organically grown foods are defined in the United States by growing organisms without the use of synthetic pesticides, genetically engineered seeds, and petroleum-based or sewage-sludge based substrates. For a company to be legally certified organic by the USDA, they must comply with the aforementioned stipulations. In Wunderlich and Gatto’s research, GMOs are typically portrayed in a very negative light in the media, which tends to influence the population’s personal opinion on the subject matter. D’Angolo’s studies have demonstrated that there are no real risks involved with consuming genetically modified foods; furthermore, studies also have shown that organic foods do not show a large nutrition gap between them and GMOs. Anonymous structured surveys will be electronically given to a wide range of participants to assess demographics with the participants views on GMOs. Conducting this research provides valuable insight on the interaction between producers and consumers, through goods sold and product preference in correlation with educational background.

Title: Differences in salt tolerance of *Spinacia oleracea* when inoculated with fungi from the rhizosphere of *Atriplex canescens*
Authors: Ethan Darby, Aubrie Bogle, Steven Kelty, Dasha Horton
Affiliation: Utah Valley University
Abstract: *Atriplex canescens* is a native Utah plant with the ability to withstand halophytic environments because of a complex relationship with microorganisms such as fungal communities in the soil. *Spinacia oleracea*, spinach, is a commonly grown crop with halophytic potential and similar tolerances to cold and heat

as *A. canescens*. *S. oleracea* and *A. canescens* are also in the same plant family, Chenopodiaceae, which makes them closely related in terms of phylogeny. This can reveal similar relationships between the *S. oleracea* and *A. canescens*. The purpose of this study is to evaluate how an inoculation made of the fungi complex in the roots of *A. canescens* affects the salinity tolerance of *S. oleracea* through a comparison of 4 treatments of inoculated *S. oleracea* plants and 4 non-inoculated control treatments (25 replicates for each treatment). Previous studies have shown success of bacterial rhizosphere inoculation of *S. oleracea* in increasing salt tolerance as well as multiple experiments with other halophytic fungi inoculants to plants not specific to the Utah region. The inoculation of agriculturally important crops was able to increase salinity tolerance and not create noxious secondary compounds or endangering conditions for other species associated with the crop. Climatic change is predicted to increase the salinity in certain Utah regions and water sources. This research is intended to test the effects of this soil salinity change to benefit agricultural endeavors and will provide important information applicable to agricultural crops.

Title: Perception Analysis of CBD at Utah Valley University
Authors: Michael Lacerda, Matthew Carter, Christopher Gowans, Kaina Payan
Affiliation: Utah Valley University
Abstract: Cannabidiol (CBD) is often given a poor reputation because of the perpetuation of false information concerning its effectiveness, addictiveness, and legality. We believe these stereotypes persist due to a lack of education on the subject and the associations and negative perception of cannabis (marijuana). As of 2019, 14% of Americans use CBD for medicinal uses (Brenan 2019). This research aims to gather information about the perception of CBD among people at Utah Valley University. It will examine the perception in conjunction to significant demographics: ethnicity, gender, area of study, education level, age, religious affiliation, income, political affiliation, and current knowledge of CBD. Randomized participants will take a survey utilizing a Qualtrics survey administered on an iPad throughout the 20 main buildings of the UVU campus. Through the publication and presentation of this research, we aim to clarify misconceptions and false information surrounding CBD and its use as a medicinal remedy.

Title: Predicting the presence of *Juniperus osteosperma* using niche modeling techniques at the Three Peaks Recreational Area
Authors: Justin D. Mickelson, Rachel T. Bolus, R. Matthew Ogburn
Affiliation: Southern Utah University
Abstract: We conducted a study in the Three Peaks Recreational Area using niche modeling techniques to predict the presence of *Juniperus osteosperma* in the area. Sampling included 506 plots (132 containing *Juniperus osteosperma*) with radii of 3 meters. Plots were tested for soil composition and evidence of plants and animals. Sampled plots were analyzed with R and MaxEnt. An analysis of the plots found that the most important factors, both biotic and abiotic, in determining the presence or absence of *Juniperus osteosperma* were the presence of a rocky terrain, total plant count, total plant species, habitat type, and soil type. In plots where the soil was not rocky, and the plant count was less than 31.5, juniper was absent in 82% of the 274 plots. The model was weakly predictive of the presence of juniper (CCR = 0.74, Kappa = 0.43, n = 506, $p < 0.01$). More research may be done by using these variables to predict the possible migration of *Juniperus osteosperma* into new ecosystems as local climates change. It is anticipated that this project will continue by sampling the plots again to obtain more consistent data collection methods and accuracy, in addition to analyzing more focal species from the sampled areas.

Title: Exploring the Synergistic Effects of Vancomycin and Electrohydraulic Shockwaves against *Staphylococcus aureus* Biofilms
Authors: Ashley Roach Escarate, Bryce Brunetti
Affiliation: Utah Valley University
Abstract: Medical device-associated infections can lead to serious complications affecting the health of patients. Electrohydraulic shockwave treatments have shown bactericidal activity in some microorganisms. Biofilms are structures formed by microorganisms enclosed in an extracellular matrix. They form on a variety of surfaces protecting the microorganisms from antibiotics and facilitating their growth. This can result in a high rate of drug resistance and in many cases results in chronic bacterial infections. Previously determined MIC_{50} concentrations of vancomycin had little effect on biofilms at 12 hours of treatment when not paired with shockwave therapy. This research evaluates the synergistic effect of different concentrations of vancomycin and shockwaves after 12 and 24 hours of treatment, given that vancomycin has shown time-dependent activity. Biofilms were grown in 96-well plates and the corresponding treatments were applied. XTT and Crystal Violet assays were used to quantify and qualify the presence of the biofilm and the antibiosis effect. The results of this experiment will be discussed in detail. A better understanding of the synergistic effects of antibiotics and shockwave therapy may lead to more effective treatment of biofilm and device-associated infections.

Title: Identifying Conservation Needs of Dwarf Bear-Claw Poppy Populations
Author: Spencer Douglas Thatcher
Affiliation: Dixie State University
Abstract: Dwarf bear-claw poppies (Arctomecon humilis Coville) are an endemic species of wildflower in Washington County, Utah. These poppies only flower for about a month during the summer. There are currently seven known locations where these poppies are found. Conservation efforts to protect these populations includes research to understand the reproductive success of each site. Populations with low reproductive success may indicate the need for additional efforts or interventions to save this unique species. Four specific locations were monitored over a three-year period. Poppies in these areas were tagged and studied during their flowering seasons and individual inflorescences were bagged and collected to determine struggling locations and their correlating issues related to population decline. Seeds were split into two groups—immature and mature—and were weighed and counted. A large percentage of immature seeds may indicate a resource or pollinator issue for the population. A low overall seed production may indicate that a resource limitation or other stressor is reducing the population viability.

EDUCATION POSTER

Title: Tracking Professional Development through the Creation of Culturally-appropriate Educational Materials
Authors: David R. Byrd, DeeDee Mower, Penée Stewart, Richard Fry, Nadia Wrosch
Affiliation: Weber State University
Abstract: Teacher candidates bring with them knowledge, experiences, values, memories, and beliefs that are culturally and socially determined when they enter their teacher education programs. Some of these factors will align well with the ideas and experiences they gain in their program, both through course work and practical experiences. However, when this knowledge, experiences, and so on are challenged, the candidate can feel some significant disequilibrium. Both types of learning can provide growth. Whereas the former can reinforce and add to existing beliefs, the latter can create instances where the teacher candidate must reevaluate and reconsider their stance and find ways to come to terms with the discordant knowledge. One area in teacher preparation where this situation can take place is in materials development. The present study examines the professional development of three US teacher candidates creating culturally appropriate stories and accompanying educational materials for Thai orphan students. Using grounded theory, the researchers triangulated philosophy statements, journals, and interviews to track how developing materials for students in a different culture than their own provided opportunities for professional growth for the participants. Initial results indicate that the candidates were able to change their teaching beliefs as they considered for whom they were creating the materials and what concepts needed to be addressed in the stories and other materials and how they could accomplish these goals. The greatest struggle and growth came as they reflected on what they created and why. The results provide implications for both teachers and teacher educators.

PHYSICAL SCIENCE POSTERS

Title: Synthesis of Halohydrins by Epoxide Ring Opening
Authors: Sydney L. Rowley, Nathan S. Werner
Affiliation: Southern Utah University
Abstract: A need exists for reactions that produce new products under mild conditions with high efficiency and selectivity throughout all fields of chemistry. Many reaction use harsh conditions that can decompose sensitive molecules. For example, hydrobromic acid can be used as a reagent to open an epoxide to create a useful halohydrin functional group. However, hydrobromic acid is a very reactive reagent that can also react with many other functional groups. We have studied the synthesis of halohydrins from epoxides using a ruthenium catalyst and visible light. The necessity and stoichiometry of all reagents was evaluated. The regioselectivity of the epoxide opening was studied.

Title: Reactivity of B-Keto Radicals with Halogens
Authors: Garett Ruesch, Nathan Werner
Affiliation: Southern Utah University
Abstract: The Ru(bipy)32+ catalyst has received a lot of attention from researchers because of its ability to oxidize or reduce organic substrates in its photoexcited state. The catalyst is known to form reactive b-keto radicals from a,b-unsaturated ketones. The focus of our research is the study of the reaction of halogen

electrophiles with the b-keto radical formed through visible-light photoredox catalysis. Various halogen electrophiles and reaction conditions were evaluated in this study. By targeting the electrophilic capture of the radical, we hope to discover more about the reactivity of this intermediate and develop novel chemistry that can be used in the synthesis of pharmaceuticals and fine chemicals.

Title: Methylene Blue Derivatives as Potential Photosensitizers in Photodynamic Therapy
Authors: Jeffrey Brenton Bushnell, Jacob Dean
Affiliation: Southern Utah University
Abstract: Methylene blue (MB) is used in photodynamic therapy, a technique used to treat cancer, such as skin, lung, and esophageal. Photodynamic therapy requires a photosensitizer molecule, like MB, that becomes excited by light and can transfer that energy to oxygen in target tissues. This singlet oxygen then attacks nearby cells, providing the therapy. While MB is effective for this treatment because of its ability to absorb light in the visible region, derivatives of the MB, i.e. those with heavier atoms, may be able to sensitize oxygen species more efficiently because of their expectedly larger spin-orbit coupling constants. In this work, a series of chemical derivatives that utilize the MB framework were investigated using time-dependent density function theory. The absorption spectra were simulated and compared against MB and the operative triplet state energies were compared to determine possible efficacy for photodynamic therapy. Calculations from these heavy atom substitutions show that their absorption spectrum can change, at times allowing for a wider range of light and enhanced absorption to excite more molecules. The results of this work suggest that several of the compounds studied would likely be even more effective than MB.

Title: Isomerization of (E)- β-Bromostyrene
Authors: Trace Wilson, Nathan S. Werner
Affiliation: Southern Utah University
Abstract: Isomerization reactions are an important method for the synthesis of geometrically defined alkenes. Cis-alkenes are less stable than the corresponding trans-isomers because of the steric interactions that occur when the large groups are located on the same side of the double bond. Therefore, cis-alkenes are typically more difficult to prepare than trans-alkenes. This can pose a significant problem when a method to prepare the cis-alkene is required. Here we present our discovery of a novel trans- to cis-isomerization reaction of (E)-β-bromostyrene.

Title: Exploring the Behavior of Bilin Subunit N-Methyl-Dipyrrinone Upon Photon Excitation
Authors: Taime Clark, Jacob Dean
Affiliation: Southern Utah University
Abstract: Chemical compounds have many pathways by which they can process, release and transfer the energy obtained by photon absorption, whether it is via a relaxation mechanism or a photochemical process. The photobilins, or photosynthetic pigments in cyanobacteria and some algae, are especially efficient at moving and preserving this light-generated energy to use for biological processes. To research how these tetrapyrrole photo pigments behave upon photon excitation, this investigation will focus on a bilin subunit , N-Methyl-Dipyrrinone in the solvents methanol and dichloromethane, individually. This compound will specifically be tested without the presence of protein binding/interactions, which can affect the energy transferring capabilities of the molecule. To perform this experimentation, UV-Vis absorption spectroscopy and fluorescence spectroscopy will be used to observe the excitation of the molecule and obtain relevant data such as the molar extinction coefficient, the fluorescence quantum yield, and rates of relaxation from the excited state. These quantities will aid in the observation of rapid molecular behavior such as torsional relaxation and isomerization. The goal of this research is to find a chemical connection between biological function and better understand the exceptional energy transferring capabilities of light-harvesting bilins.

Title: Fourier Analysis of Ultrasound Signals for Identification of Scatterer Diameter in Agarose Microbead Phantoms
Authors: Brandon Jolley, Alex Johnson, Whitney Parry, Olivia Johnson, McKenna Parr, Clayton Rawson, Tyson Hoyt, Vern Hart
Affiliation: Utah Valley University
Abstract: Early cancer detection requires identifying the disease at a cellular level, by distinguishing cancer cells from healthy cells at low concentrations (<0.1%). Cancerous cells typically have larger nuclei than healthy cells and can be distinguished using a variety of optical techniques, but this process is complicated when the fraction of malignant cells is extremely low. As such, high-precision detection requires highly accurate measurements of cell confluence and the ratio of healthy to cancerous cells. Techniques such as machine learning and Fourier analysis have been used to auto-segment cells in microscopy images. However, these techniques often lack a ground truth standard to validate the segmentation results. We present a

methodology for producing agarose tissue phantoms embedded with mixed polystyrene microbeads of varying diameters. These phantoms were imaged using a 2D translational stage and a microscope camera, collecting hundreds of images for input to an artificially intelligent neural network for training and classification. The ability of this binary classifier to identify and quantify micro-beads in the images was assessed by comparing the automated results to manual counts, producing accuracies above 90% for bead sizes of 50–200 microns. A 50-MHz ultrasound transducer was used to collect scattering patterns from each agarose phantom. Fourier analysis of these signals showed variations in the attenuation of 52–60 MHz. Results will be presented for 5 different bead diameters, which were accurately distinguished from the accompanying power spectrum.

SOCIAL SCIENCE POSTERS

Title: Scouting Friends Will Always Be: Communities in the Boy Scouts of America
Presenter: Amanda McFarlane
Author: Amanda McFarlane
Affiliation: Brigham Young University
Abstract: The Boy Scouts of America has recently encountered several financial problems that have led many to believe that the organization will go bankrupt and cease to exist. In the light of criticism from both sides of the political spectrum—conservatives typically disliking policies accepting gay and transgender leaders in 2015 and then girls into the Scouts, BSA program in 2019 and liberals typically believing it promotes toxic masculinity and nationalism—some have argued that the Progressive era organization has nothing left to offer the divisive environment of 21st century America and the establishment's end is inevitable. However, this paper will argue that Scouting does have something vital to offer. Exploring research done among staff working at Camp Maple Dell in Payson, Utah, during the summer of 2019, this paper will show how Scout Camp creates communities among the staff and fosters a sense of connection with other people that is imperative for healthy social development. Despite it becoming increasingly rare to find this mode of sociality in modern American society, communities at camp is foundational to the daily functioning of Maple Dell. Communities are centered around the unexpected and often inexplicable events that are simultaneously unique to and extremely common at Scout Camp. Through mutually experiencing these events and perpetuating them, staff members create relationships that border the ranges of kinship. Beyond an enjoyable summer job, this environment fosters relationships that can provide a support network years after having worked at camp. Despite the criticism it faces, Scouting provides a unique atmosphere for these relationships to form, which serves to fill an important social need for young adults that otherwise aren't often being met.

Title: How Do You Like Your Eggs?
Presenter: Aubrielle Atkinson
Authors: Sarah Applegarth, Kole Graper, Teran Sorensen
Affiliation: Snow College
Abstract: How do you like your eggs? In the movie, Runaway Bride, the main character, Maggie, changes the way she likes to eat her eggs every time she gets into a new relationship. In the article entitled, "The Psychology of Romance: The Impact of Personality Traits on Romantic Relationships", Amanda Glynn cites authors, Buss and Watson, who say that, "One leading theory is active assortment, where people prefer partners whose personalities resemble their own." This may be able to explain why many times it seems as if people will change who they are or what they are interested in based upon their significant other and their interests and opinions. We will conduct research to see if there is a personality that changes more in romantic relationships based on the domains of the Big Five Personalities, which are Extroversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. Our research will be mainly focused on personality change within romantic relationships and the gender of the person in the relationship. To test these factors, we will present a survey to a variety of different people including 50 men and 50 women in relationships, 100 people who have close friends in relationships, and 100 parents who have children in relationships. The survey will be made up of questions that reflect and demonstrate each domain of the Big Five Personalities. These questions will have the survey participants rate, on a scale, the personality of the individual in the relationship before and after the relationship began. The answers to these surveys will then help us see how much the individual's personalities changed and what aspect of their personalities changed the most. We will also be able to compare men and women and see if gender plays a key role in personality change within a romantic relationship.

Title: What makes you jump: Can a brief auditory and visual stressor cause a measurable stress response?

Presenter: Maren Payne
Authors: Maren Payne, Claudia Jorgensen, Tyler Barton, Peter Williams, June Perez, Mandie Stephen, Jessi Hill
Affiliation: Utah Valley University
Abstract: Research conducted in various animal species including humans has led to evidence suggesting that stress in excess can be physiologically and psychologically harmful. Researchers have found a correlation between chronic exposure to stress and the development of anxiety and major depression disorders. Stress is an inevitable aspect of human life and can vary in duration and intensity depending on the individual. Experiencing a stressful stimulus leads to the activation of the hypothalamic pituitary adrenal (HPA) axis, which causes the release of stress hormones (such as cortisol). Furthermore, the activation of the HPA axis leads to an increase in heart rate and blood pressure. The current study assesses whether a brief stressful visual and auditory stimulus can elicit a measurable physiological stress response in college students. The participants watched a 32-minute video clip of a television show containing a 1-second stressful visual and auditory stimulus. The stressful stimulus had been spliced into the television show and occurred halfway through the video clip allowing for comparison of physiological measures prior to stressor (baseline), during stressor, and during recovery (after stressor). Throughout watching the video clip, participants' physiological measures were recorded using an electrocardiogram associated with BioPac software. Subsequently, the participants' heart rate and heart rate variability prior and immediately following the stressor were compared by repeated measures ANOVA to assess whether the stress response was measurable. The successful completion of this experiment will guide future studies to assess various conditions that might shorten or prolong the recovery period after a stressful experience. Obtaining knowledge about the factors that can shorten the recovery period after a stressful experience will allow us to promote healthy coping techniques. Indeed, developing healthy coping mechanisms to deal with stress could positively influence the academic performance of college students and improve their psychological and physiological well-being.

Title: Observing Healthy Progression in Relationships Throughout Generations
Presenter: Avery Whitaker
Authors: Haleigh Chester, Jackson Bird, Kiersten Strat, Kloie Park
Affiliation: Snow College
Abstract: Most people have experienced a romantic relationship in their lifetime. As a group of curious students, we hope to gain a deeper insight into relationships. The study being proposed is that of observation through different types of physical progression in relationships, whether there is a healthy or unhealthy way. This will be achieved by comparison and analysis of what individuals define as so. The anticipated outcome is to gain an understanding of how individuals have progressed in their personal relationships to create an outline for what constitutes different types of relationships.
This project will provide an opportunity for individuals to observe what deems a healthy or unhealthy relationship. Many studies and articles have been published in relation to the psychology of relationships. The NCIPC suggests that "respect for both oneself and others is a key characteristic of healthy relationships. In contrast, in unhealthy relationships, one partner tries to exert control and power over the other" (National Center for Injury Prevention and Control, 2005). This article gives a basis for comparing relationships.
In order to observe healthy and unhealthy relationships, a survey will be conducted. The survey consists of three parts where questions will be asked to determine how each relationship model progresses according to the individual. First, participants will be asked what influences their views or relationships. Second, each participant will be asked to put a specific list of various physical actions, in order to specify a healthy relationship. Third, each participant will be asked to put the same list of physical actions in order to identify an unhealthy relationship. Online dating terms will be included in the second and third surveys. The conclusion will be to compare results and see how demographics play a role in the results.

Title: "Selfie" Self-Esteem
Presenter: Hayley Hightower
Authors: Sarah Chipman, Adeline Frank, Quincy Kunz, Abigail Spackman, Danielle Noorda
Affiliation: Snow College
Abstract: There are many ways to alter yourself or your pictures to post on social media, including filters, digital editing, using make-up and posing. In a sample survey of US adults, 93% said they believe photos are edited before they are posted (Spector, 2017). For our research, we want to know how posting

uncurated, natural selfies on social media affects a person's self-esteem. Our research is going to measure the self-esteem of our participants by administering a survey before and after our experiment, as well as by tracking the participant's posts/comments on social media. We will collect as many participants as we can to randomize into two groups that will allow us to gather enough data about posting on social media and its effects on self-esteem. The control group for our experiment will be posting to social media as much as the experimental group, every other day for two weeks, and will be posting the same content to social media as they normally do. The experimental group will be posting selfies they take of themselves first thing in the morning: puffy eyes, no make-up, no altering or editing their photos in any way. We will observe the comments and reactions of others on their posts, which will allow us to compare the change in self-esteem of the experimental group with the control group. If this study shows that after posting uncurated photos their confidence goes down, then it justifies people in editing their photos and making themselves look good online. However, if they find their self-esteem goes up, then there will be evidence to show it is unnecessary to alter every photo of themselves.

Title: Reflexive and Sustained Attention: Identifying Individual Variability in Children
Presenter: Brian Farstead
Authors: Tanner Williford; Hunter Schow; John Muldowney; Victoria Stewart
Affiliation: Brigham Young University-Provo
Abstract: Reflexive and sustained attention are important components of daily functioning, and those who exhibit attention deficits typically have problems in school, work, and relationships. Previous studies have measured sustained and reflexive attention using different tasks with disparate stimuli. Because the stimuli are different, it is unclear how reflexive and sustained attention are related. There are some indications in the literature that individuals tend to be better at one or the other type of task. We measured reflexive and sustained attention in a sample (N=185) of children who completed two computer tasks that recorded response time and accuracy. We developed the two tasks so that all stimuli were identical, but the reflexive attention task used peripheral stimuli and the sustained attention task used central stimuli. Parents also completed questionnaires reporting demographics (e.g., age and sex) and the child's usual sleep habits, behavior at home, and behavior at school. Asking about sleep, home behavior, and school behavior allows us to identify predictors of individual variability in computer-task scores. We anticipated that children who have a better reflexive attention (lower response times and higher accuracy) would score lower on sustained attention. Furthermore, we expect the relationship between reflexive and sustained attention would be moderated by aspects of behavior related to sleep, home life, and school. Determining the relationship between different components of attention is important because it will help us to understand the underlying factors that contribute to different deficits in attention. Furthermore, it is important to understand how these different components of attention manifest by age, sex, behaviors at home and behaviors in school. Understanding the relationship between reflexive and sustained attention and their association with child characteristics could potentially contribute to interventions in individuals who have symptoms of attentional deficits.

Title: The Role of Parental Control on Childhood Anxiety
Presenter: Natalie Merrill
Authors: Jennifer Shubert
Affiliation: Utah Valley University
Abstract: Anxiety is a growing epidemic among society today, and the age of onset is becoming increasingly younger. Control over one's environment is a major contributor to anxiety, thus research on childhood anxiety revolves around parenting styles related to acceptance and autonomy granting behavior. It is hypothesized that children of parents who lack autonomy granting behaviors are more likely to suffer from anxiety, due to their perceived lack of control. The primary aim of this study is to assess the development of anxiety in youth through addressing two factors—parental control and child's perceived control—and how these factors relate, thus leading to the development of anxiety. Data for this study comes from Wave 6 of the Schools and Families Educating (SAFE) Children Study. The study consists of 338 children ages 9–10 (Mage = 9.11, SD = 0.31; Female = 53.4%), 339 parents, and 305 teachers. Linear regression analyses revealed parental involvement significantly predicted social anxiety, $\beta = .181$, $t(338) = 2.77$, $p < .01$. Results support the hypothesis that excessive parental involvement contributes to the development of childhood anxiety. Prior literature found that over-reactive parenting encourages the child's dependency on their parents, resulting in an underdeveloped sense of self and fearful perspective of the world. When children lack opportunities for independence, they do not develop

proper decision making and coping skills, thus leading to anxiety. Informing parents on the importance of autonomy granting practices during early childhood and educating children on positive decision making skills and healthy coping mechanisms for stress will decrease the child's likelihood of developing anxiety.

ORAL ABSTRACTS

ART ORAL

Title: Ballet and Bonaparte: Understanding Napoleon Bonaparte's Lasting Influence on the Art of Dance
Author: Golda Dopp
Affiliation: Utah Valley University
Abstract: The purpose of the presentation is to explore Napoleon Bonaparte's influence on the physical and fleeting art of ballet. His role as master choreographer of war has been studied extensively, with an exhaustive field of research relating to his manipulation of power. The intricacies of how he used dance for personal and national gain, and what lingering effects survive to this day, have been relatively untouched by scholars. This presentation outlines the political peregrinations of ballet surrounding and during the Napoleonic years, from 1790–1815. Organization is chronological, with four main parts: how the Enlightenment helped ballet survive the 1789 Revolution and The Terror; what role dance claimed in the Revolutionary festivals and national fêtes of the Directory and Consulate; how Napoleon's cultural admiration of antiquity influenced ballet; and finally, how Napoleon's militant approaches shaped the discipline and pedagogy of ballet. The argument is made that the Enlightenment, combined with Napoleon's strategic adoption of ancient regime characteristics, were necessary in perpetuating ballet as an art form. Napoleon's military defeat against Russia enabled the rise and popularity of Russian ballet and marked a shift in French dance culture. The presentation is based on a written, 20-page essay article and targets a professional audience with little ballet experience. Brief demonstrations of ballet movement will be shown, and visual cues such as photos and diagrams utilized.

Title: Classical Persian Art: Toward an Ecological Perspective
Author: Barry Wood
Affiliation: Dixie State University
Abstract: The classical arts of Persia, meaning the arts of the region now known as Iran from roughly the 10th to 16th centuries, are renowned for their combination of technical excellence and a strongly decorative aesthetic. Mosques and other buildings are clad in tiles forming intricate arabesques, geometric patterns, and calligraphic inscriptions; manuscript illustrations feature minutely detailed figures in shadowless landscapes of saturated colors; carpets, ceramics, and other utilitarian objects are ornamented with overall designs featuring floral, geometric, and occasionally figural decoration. In this paper I suggest a novel way to think about these arts, along with the issues and questions raised thereby. The perspective from which I approach these arts may be termed "ecological," as it is inspired by the branch of biology that studies organisms in relation to their environment. Understanding the creation of manuscript paintings, architectural decoration, and other arts in ecological terms, i.e. as a living being's survival-directed modification of its environment, opens up interesting new possibilities and challenges of interpretation. For example, if Persian architectural decoration is to be explained on the same lines as we explain other animals' interaction with their natural surroundings, the survival significance of such an activity has to be accounted for, including the apparent inutility of an effort seemingly aimed solely at pleasing the sense of sight. My analysis will suggest some answers to this and related questions, with the ultimate goal of forming a coherent methodology and research program.

Title: Switching Channels: Information Theory and the Rise of Contemporary Art
Author: Travis Lee Clark
Affiliation: Utah Valley University, Department of Art and Design
Abstract: By the mid-20th century, it seemed the visual arts had achieved the ideal plateau that Clement Greenberg and other theorists had predicted for nearly thirty years. Abstract and non-objective, it shunned narrative and representation for the universal expression and experience of the painter's mark. Pollock, de Kooning, Rothko were the benchmarks of the era. Yet within a decade, the gestural drips and color-fields of Modernism would be supplanted by an odd assortment of soup cans and comic panels; performances, new media, installation and conceptual art. This wave of disruptive innovation overwhelmed the art world, and Modernism, ironically, became so associated with the past, that a new term, Contemporary, had to be coined. As shocking as this revolution was, it might not have caught art critics and theorists off guard, had they been aware of the work of Claude Shannon. The founder of Information Theory, Claude Shannon was concerned with information systems and telecommunications, but his theories have since found broader application in the fields of economics and even biological evolution. The current study is a unique one that attempts to demonstrate that the never-ending hunt for novelty and innovation in Contemporary Art is related to the field

of Information Theory. My paper attempts to see Contemporary Art as a classic information system, with its own signals, noise and channels. Moving to new media or experimental forms in contemporary art fits the classic archetype for dealing with "noise" that is disruptions in messaging in information systems by switching to a channel that is quieter or overlooked. The first generation of contemporary artists, overcome by the noise of modernism, switched channels, and thus changed the paradigm for art, and the art world has been switching channels, ever since.

Title: The Holocaust, Sigmund Freud, and Anna Sokolow
Author: Cassidy Blackham
Affiliation: Utah Valley University
Abstract: World War II. The Holocaust. These cultural touchstones have permeated the general consciousness of the global populace, infiltrating the unconscious minds of millions of people even today, namely, the Jewish population (Leys 24). This research will demonstrate that Anna Sokolow, an influential modern dance choreographer in the mid-twentieth century, was one such Jew. Her piece Dreams (1961) has been lauded as an important Jewish choreographic work showcasing the horrors of the Holocaust that was realized from the nightmares Sokolow was experiencing at the time (Warren 144). Current scholarship in dance research has concluded that dance reflects culture (Keali'inohomoku 33). Researchers can assume that dance, whether that be a general dance form or a specific choreographic work, is reflective of the culture at large and an individual's cultural microcosm. Sokolow's vivid nightmares which served as the motivation behind her piece, according to Freud's dream theory, are a direct reflection of her repressed emotions (Freud, Interpretation, 189). This psychoanalytic perspective originated from Sigmund Freud's concept of psychoanalysis as a way of talk therapy (Freud, Interpretation, 141). Now, it is used as a frame of analysis to critically interpret the choices made when a creator is in the creative process to discern their unconscious motivations which will provide a fuller understanding of Dreams (Tyson 29). Freud's dream theory offers a means to interpret one's dreams which explains a person's behavior through revealing their internal drives, motivations, and emotions (Rickman X). A critical analysis of Dreams and a synthesis of peer-reviewed source material through a psychoanalytic perspective utilizing Freud's dream theory will demonstrate the implications the Holocaust had on Sokolow's unconscious mind, as revealed through her dreams, resulting in her masterwork: Dreams.

Title: Healing Trauma: Exploring a More Just Future & Working Towards Joy Through Artmaking
Author: Audrey Reeves
Affiliation: Utah Valley University
Abstract: Many students are experiencing trauma, including physical abuse, sexual abuse, emotional abuse, physical or emotional neglect, exposure to domestic violence, household substance abuse, household mental illness, parental separation or divorce, and incarcerated household members. Furthermore, they may be also experiencing societal oppression, such as inequality and discrimination based on race, ethnicity, gender, sexual orientation, social class, and disability. Art teachers regularly design projects that engage students in meaningful and relevant art experiences by encouraging students to interrogate and critique social problems, which may overlap with students' trauma (Kay & Wolf, 2017, p. 27). This may lead to art teachers hearing stories of trauma every day in the classroom. Art teachers wrestle with how to help students with trauma looking into a seemingly unhopeful future. The purpose of this paper is to provide curricular considerations for K-12 art teachers with students with trauma. It is important for an education curriculum to allow student choice and enable students to voice their narrative that may be intertwined with trauma and societal oppression. Although looking at students' past and present is useful, teachers should also empower students to create and imagine a more just and joyful future. Art education curriculum should not solely focus on the pain students experience but should allow students to escape and give room for fun within the art classroom. A curriculum should balance expression and working through and critiquing students' traumatic circumstances with imagining joy and escape.

BIOLOGY ORAL

Title: Structural Characterization of Junctional Adhesion Molecules
Authors: Christopher Mendoza, Dario Mizrachi
Affiliation: Brigham Young University
Abstract: Tight junctions are proteic structures in the apical portion of endothelial and epithelial cells. Their function is to create a barrier for tissues that protects them from unwanted substances. One of the strongest barriers maintained by tight junctions is the blood–brain barrier. Several membrane proteins are integral parts of tight junctions: claudins, occludin, tricellulin and junctional adhesion molecules (JAMs). Much has been researched about them except the small family of JAM proteins. There is a lack in understanding as to the role of these proteins in tight junctions. A proper characterization of these proteins is needed to understand their

adhesion properties and protein–protein interactions with other members of the tight junctions. Here we report for the first time in the literature, the oligomeric state of each member of the JAM family, their constants of affinity for self-association and for association with other JAM proteins and other tight junction proteins. We resourced Synthetic Biology and Surface Plasmon Resonance to obtain our results. With this information, we describe a possible mechanism of assembly and maintenance of tight junctions.

Title: The effect of urbanization on genetic diversity in southern Utah ant populations
Authors: Johanna Garavito, Glade Shakespeare
Affiliation: Southern Utah University
Abstract: Urbanization can have profound effects on habitats and the plant and animal species found within them. The increase of urbanized areas worldwide can have limiting effects on genetic and species diversity by reducing gene flow and disrupting ecosystem functions. Ants (Formicidae) are found worldwide and are considered indicators of ecosystem biodiversity and health. This research characterized the population genetic structure of ant populations in urban and nonurban areas of southern Utah. We collected ants from several locations in Cedar City (Canyon Park, Lake on the Hills, along Main Street; urban), Southern Utah University Mountain Center (nonurban), and Three Peaks Recreation Area (mixed used public land). Ants were classified to their genus with morphological characteristics using a modified dichotomous key. Biodiversity was highest in Cedar City (Shannon Diversity Index, *H'*=1.503; Evenness, E=0.840) and lowest in Three Peaks Recreation Area (*H'*=0.817; E=0.589). DNA was extracted and amplified at 10 microsatellite loci for 201 ants. Population genetic parameters were compared between urban, nonurban, and mixed-use areas to investigate the effect of urbanization on ant genetic diversity. Ants in the genus *Formica* were moderately diverse in Cedar City (gene diversity was 0.764) and SUU Mountain Center (gene diversity was 0.689). Ants were more inbred in Cedar City (FIS=0.607) than at the Mountain Center (FIS=0.488). Similar patterns were estimated in *Dorynomyrmex* and *Lasius*. Ants in each genus were more related than expected in all localities, which suggested that ants within a locality may have been collected from one colony. Our results suggested that urbanization may not have a large effect on species and genetic biodiversity in ant populations in southern Utah. A longer term study may provide more insight into how urbanization impacts ant biodiversity.

Title: An analysis of ITS1 in two *Equisetum* subgenera: Secondary structure and non-metric multidimensional scaling
Author: William D. Speer
Affiliation: Salt Lake Community College
Abstract: ITS1 sequences were used to evaluate relationships between 19 *Equisetum* specimens representing 9 (of 15) species plus three hybrid taxa from subgenus *Equisetum* and subg. *Hippochaete*. Most of the sequences examined had comparable lengths (231 to 232 bp). However, *E. sylvaticum* (subg. *Equisetum*) had a 62-bp deletion, making it only 170 bp in length. Secondary structures were similar except that for *E. sylvaticum*. Non-metric multidimensional scaling ordinations were conducted for 1) uncoded nucleotide sequences, 2) numerically coded sequence data, and 3) *in silico*-derived restriction site (presence/absence) data. In general, the ordinations tended to distinguish the two subgenera, although conspecific specimens did not always group together. The interspecific relationships obtained were at times inconsistent with other studies. Furthermore, *E. myriochaetum* (subg. *Hippochaete*) was placed quite close to, though distinct from, the subg. *Equisetum* specimens in some of restriction site data ordinations. Unrooted UPGMA and NeighborNet trees (networks) using GeneContent distances were used to further analyze the restriction site data. This study suggests that ITS1, while useful in delimiting the subgenera, may not be as useful in elucidating relationships within or between closely related *Equisetum* species.

Title: Gluconate metabolism by *Lactobacillus wasatchensis* is another risk factor for late gas production in aging cheese
Authors: Kate Sorensen, Craig Oberg, Matthew Domek, Michele Culumber, and Donald McMahon
Affiliation: Weber State University and Utah State University
Abstract: *Lactobacillus wasatchensis*, a nonstarter lactic acid bacteria, can cause late gas production, splits, and cracks in aging cheese when it metabolizes a six-carbon sugar, particularly galactose, in cheese to a five-carbon sugar, resulting in the release of CO_2. Previous studies have not explained late gas production in aging cheese when galactose is not present. Based on the genome sequence of *Lb. wasatchensis* WDC04, genes for potential metabolic pathways were mapped using Knowledgebase Predictive Biology software (KBase). Modeling predicted that *Lb. wasatchensis* WDC04 could metabolize gluconate. Gluconate contains six carbons and *Lb. wasatchensis* WDC04 contains genes to decarboxylate it to ribose-5-P and CO_2 using phosphogluconate dehydrogenase. This study's purpose was to determine if sodium gluconate, often added to cheese to reduce calcium lactate crystal formation, could result in gas production when metabolized by *Lb. wasatchensis*. Carbohydrate restricted MRS (CR-MRS) was mixed with varying ratios of ribose, sodium

gluconate and/or D-galactose (1% total sugar content). Oxyrase (1.8%) was also added to create an anaerobic environment similar to aging cheese in the CR-MRS tubes. Tubes were inoculated with a four-day culture of *Lb. wasatchensis* WDCO4 and incubated at 30°C and results recorded over eight days. Of the 10 ratios used, gas was produced in six, with the highest gas production resulting from 1% sodium gluconate with no added ribose or galactose followed by the ratio of 0.3% ribose/0.7% gluconate (1% total sugar concentration). Assuming other strains of *Lb. wasatchensis* have the same genes for metabolizing gluconate and producing CO_2 gas, adding sodium gluconate during manufacture of cheddar cheese is another risk factor for growth of *Lb. wasatchensis* during cheese aging and subsequent unwanted gas production resulting in the formation of splits and cracks in cheese.

Title: Fermentation of Plant-based Extracts by Dairy Lactic Acid Bacteria
Authors: June Smith, Niharika Mishra, Craig Oberg, Michele Culumber
Affiliation: Weber State University
Abstract: Plant-based fermented foods to replace milk-based fermented foods, such as yogurt and cheese, have become a growing cultural necessity. These products are currently being produced using dairy fermentation cultures and processing equipment. Therefore, it is necessary to determine if dairy-derived lactic acid bacteria (LAB) cultures can effectively ferment plant-based milk substitutes. Initially, selected dairy bacterial strains were profiled for carbohydrate utilization using API CH50 carbohydrate panels to determine if they can ferment the types of sugars available in plant extracts. Three plant-based extracts (almond, coconut, and oat) were incubated with specific LAB cultures at three inoculum levels and the pH monitored over 420 minutes of incubation at 37°C. Results showed that fermentation (acid production) is LAB strain dependent based upon the type of plant extract being fermented. Only two LAB strains could ferment coconut and almond extracts (YFL01 and YFL02), while most LAB tested could ferment oat extract especially at the lower inoculum levels required for commercial production.

Title: Microbial Load Reduction in Athletic Locker Rooms Using Ozone Treatment
Authors: Xavier Stilson, Kawika Tupuola, Clark Madsen, Craig Oberg
Affiliation: Weber State University
Abstract: This research was conducted to determine if a commercial ozone generator was effective is reducing *Staphylococcus aureus* and *Escherichia coli* in an athletic locker room and to determine its limitations. Petri plates (TSA media) inoculated with a nonpathogenic strain of either *S. aureus* or *E. coli* were put in strategic locations in triplicate in collegiate locker rooms. Lids were removed from the inoculated petri plates and two ozone generators (Extreme Ozone Co.) were run for 120 minutes (trial 1) or 180 minutes (trial 2). Inoculated plates were placed from 3 to 70 feet from each ozone generator. Distance from the ozone generator, height of the plates, time exposed to ozone, and whether the plates had obstructed airflow were measured. After ozone infusion, petri plates were incubated for 48 hours at 37°C. Two hours into the run cycle, average ozone readings increased from a background of 17 ppb to 1042 ppb at ground level and 1344 ppb 1.5 m above ground level. Results for trial 1 showed an overall *S. aureus* reduction of 78.7 ± 8.3%, while trial 2 showed an increase in the overall reduction to 93 ± 1.8%. In trial 2, results for *E. coli* survival showed an overall reduction of 89.6 ± 3.0%. On average, a plate in an obstructed location such as a cabinet or foot locker had a 24% decrease in kill rate compared with similar plates, which increased to 38% when looking exclusively at *E. coli*. Plates at a higher elevation trended toward higher kill rates than those at low elevations. These results show that ozone can reduce *S. aureus* and *E. coli* in locker rooms and that increasing the run time from 2 hours to 3 hours significantly decreases survival rates regardless of distance.

Title: Can Automatic Hand Dryers Serve as a Microbial Reservoir for Contamination?
Authors: Riley Nichols, Hyrum Packard, Craig Oberg, Matthew Domek, Michele Culumber
Affiliation: Weber State University
Abstract: Our purpose was to determine if the hand dryers in public restrooms are antiseptic or if they are a source of contamination to your hands during drying. The first phase was to determine restroom areas at Weber State University that had a high frequency of foot traffic, making them good locations for sampling. Testing was conducted by swabbing a 5-cm^2 area of the top, middle, and bottom of the hand dryers using a 3M Quickswab. Pour plates using TSA were made to enumerate samples. Testing was done in men's and women's restrooms in three buildings on campus, testing four bathrooms in each building. Plate counts were determined at 48 hours after incubation at 37°C. Results showed that the bottom of the dryers in both the men's and women's restrooms had the most contamination, with an average of 311 CFU/5 cm^2 in the men's rooms, and an average of 299 CFU/5 cm^2 in the women's. The middle section was the second most contaminated for both men's and women's restrooms, averaging 144 CFU/5 cm^2 for men and 145 CFU/5 cm^2 for women. The top was the least contaminated for both men's and women's restrooms averaging 107 CFU/5 cm^2 for men and 51 CFU/5 cm^2 for women. Both *Staphylococcus* (MSA plates) and coliforms (VRBA plates) were isolated from

selected dryers. Results showed that these dryers serve as a source of contamination after hand washing, and the levels of contamination in the dryer can be correlated with the amount of foot traffic through the restroom and men (higher levels of CFU) versus women. As a preventative measure, the inside of these dryers should be cleaned on a daily basis to prevent people from contaminating their hands immediately after washing them.

Title: A Comparison of the Perceptions of Genetically Modified Organisms among Differing Religious Beliefs and Educational Backgrounds
Authors: Shane Gunnerson, Blake Johnson, Rylaan Marlowe
Affiliation: Utah Valley University
Abstract: The perception of genetically modified organisms (GMO) is an important and controversial topic today, particularly with information and misinformation coming from vastly different sources. Identifying perceptions of GMO is pivotal to public health education and GMO implementation. Previous research of public perception is either outdated or is not correlated. This, along with a changing ecosystem, indicates an increased need for genetic modification of organisms to grow in different environments, in order to meet the needs of the changing ecosystem. The objective of this research is to identify possible correlations in perception of GMO among educational backgrounds and religious beliefs. The results of the study can be used for further application by public health officials in addressing educational needs among the correlated results. We will be using a survey with set questions to identify demographics and individual perception of GMOs. We will then use standard statistical analysis to identify correlations between educational backgrounds and religious beliefs. The results of this research can be used to further educate the indicated populations on GMO and aid in the overall acceptance of GMO in the United States.

Title: Reduction of human cytotoxicity by the brain-eating amoeba *Naegleria fowleri* due to drug and complement inhibition
Authors: Joshua O. Gee, Daniel N. Clark
Affiliation: Weber State University
Abstract: *Naegleria fowleri* is a free-living amoeba that is capable of parasitizing the human central nervous system. *N. fowleri* is the causative agent of primary amoebic meningoencephalitis (PAM) which has a fatality rate of ~98%, with diagnosis often only revealed post-mortem. It is hypothesized that *N. fowleri* possesses a protein similar to that of human CD59 complement regulatory protein, the CD59-like protein. The CD59-like protein is believed to play an important role in the infection process by preventing the amoeba from being lysed by the complement system. *N. fowleri* were treated with combinations of anti-CD59 antibody and the experimental drugs amphotericin, azithromycin, and miltefosine. Measurements of cell death in *N. fowleri*, as well as the survival of infected human cells revealed that the CD59-like protein was neutralized by antibody and the relative effectiveness of these drugs. These findings provide initial steps toward effective treatment of devastating PAM infections.

BUSINESS ORAL

Title: A Pedagogical Model for Teaching Data Analytics in an Introductory Information Systems Python Course
Authors: Heber C. Brau, Mark Keith
Affiliation: Brigham Young University
Abstract: In this paper, we answer the call of Sheppard (2012) and Brunner & Kim (2016) and present a model for teaching data analytics in an introductory information systems class using Python programming language. The pedagogy follows an active-learning strategy in which students are assumed to have no statistical or Python programming training prior to class. The learning outcomes include: 1) Data: write code to import and manipulate data; 2) Visualization: write code to generate useful and theoretically sound data visualizations; 3) Feature Engineering: write code to generate, condense, or recombine variables (i.e., "features") of any type (numeric, categorical, ordinal, text) to provide the best possible predictive performance; and 4) Prediction: write code to estimate the effect/weight of a set of feature variables on a label variable. The first portion of the course covers fundamental programming in Python similar to Frydenberg and Xu (2019), focusing on the specific areas of: Variables and Data Types; Input/Output; Flow Control; Functions; Packages (installing, accessing); Data Sources (reading/writing); and Data Mining (CRISP-DM). The second portion of the course consists of students using their newly-learned Python programming skills to apply statistical data analytics. Empirical analysis includes student feedback from the Fall 2019 semester, the first time this course has been taught. We compare and contrast the feedback with Holman (2018) who covers similar material with differing pedagogy.

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Title: Plugged-In: Rural Readiness for Technology Industry
Authors: Hayden Johnson, Laurie Harris
Affiliation: Southern Utah University
Abstract: Many rural Utah communities face major problems with declining economies. Rural communities in Utah may be an excellent place for technology companies to expand. Adding to the problem, median incomes in nine rural counties is $48,306 while the statewide median income is $62,961 (US Census Bureau, 2017). Rural areas seem to be an untapped well of potential to help both the state's economy and tech companies themselves. This research explores how to effectively use that potential. The research identifies needs and limitations that currently exist in rural communities that can prevent or is be seen as obstacles for technology industry to grow in these areas. Research was conducted by looking into the viability of technology companies being able to expand and/or start up in rural Utah by exploring if those areas are ready for the technology industry. Specifically, the research examines: 1. Current educational opportunities related to technology in rural area school systems; 2. Interest among potential workforce in technological fields; 3. Presence of skilled workforce in these rural areas; 4. Potential to form partnerships between higher education and high schools to offer better education and generate interest; and 5. Infrastructure of rural areas to support growing technology industry. Additionally, obstacles that are preventing these areas from being able to support technology industry are found and examined. This research constitutes the first step in helping bolster rural economies through an increase of jobs and industry into those areas. By conducting extensive research and getting in on the front-lines of the problem, current situations are more understood and potential suggestions can be developed.

Title: The Impact of Video Games on College Academic Performance: An Empirical Analysis of an Introduction to Information Systems Class
Authors: Heber C. Brau, Finnegan McKinley, James C. Brau, James Gaskin
Affiliation: Brigham Young University
Abstract: We extend the work of Brau, Brau, Owen, and Swenson (2016) and Brau, Brau, Rowley, Swenson (2017) along two dimensions. First, we include video game and social media factors to their portfolio of independent variables. Second, we use a dataset of information systems students as an alternative to marketing and finance students. To these variables shown to have explanatory power in the extant literature, we add over 40 additional questions that involve video game activity and social media activity. We conduct a survey with 197 respondents of college students in an introductory (200-level) information systems class. The survey provides our independent variables for our subsequent empirical tests. The dependent variable for our study is the total semester course grade each student earned. Example descriptive statistics from the data indicates that 74% of the students in the class played video games during the semester. The average age they started playing video games was 6.7 years, with a standard deviation of 3.2. In addition, 79.6% of student respondents who played video games indicated that their parents attempted to regulate their playing time before they left for college. Preliminary results indicate that students who played video games (indicator variable set equal to one if they played and zero otherwise) during the semester did no worse and no better than those who did not. Additionally, the length of time students played video games (for those who played) indicated no significant impact on their course grade.

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Title: Utah State Capital Resource Allocation: A Proposal for Increasing the Transparency of Capital Expenditures, Including Facilities
Authors: Nathan G Caplin, R. Neil Walter
Affiliation: Snow College
Abstract: Capital expenditures are a unique challenge in state budgets because subdivisions of the state are rarely charged for using the state's debt or equity for facilities, equipment, and other investment needs. In an

effort to take advantage of the current resource allocation process, state subdivisions lobby for capital expenditure appropriations. The result is an inefficient distribution of resources for capital expenditures within state budgets where the most-connected, best-funded lobbying efforts frequently win. This paper proposes changing the capital resource allocation processes by attaching a cost to state appropriated capital expenditures in an effort to increase accountability and efficiency while improving the long term credit strength of the state.

Title: Teaching Python Data Analytics Through External Object-Oriented Game Design
Authors: Heber C. Brau
Affiliation: Brigham Young University
Abstract: The current practice of teaching data analytics typically begins by introducing Python code in the context of statistics (e.g., Frydenberg and Xu (2019) and Holman (2018)). The author's experience of teaching the material under this pedagogical flow suggests that a superior approach is available to teach students Python data analytics. My observation has been that when trying to jointly learn Python and statistics, students are often confused by either the code, the statistics, or both. To help ameliorate this confusion, I introduce a method for teaching Python coding in the first part of a Python Analytics class through first focusing on Python syntax and logic (and not statistics). The approach is based on online tutorials that walk students through programming a video game in Python. Through the video game, students efficiently learn proficiency in Python code in a fun way. This paper details the video game, Python code, and pedagogy involved in the process. I introduce an external and unique game-building framework of proprietary architecture. The second half of the course is similar to Brau and Keith (2019), teaching statistical concepts that are operationalized in Python. An experiment is conducted with students, randomly assigned to either the traditional way of instruction (i.e., Brau and Keith, 2019) or this new game design approach. Student feedback is used as qualitative data and coding performance is used as quantitative data.

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Title: Attitudes and Perceptions of White Collar and Street Crime
Authors: Jill O. Jasperson, Ronald M. Miller, Thomas Dearden
Affiliation: Utah Valley University; Virginia Tech
Abstract: The incidence and severity of white-collar crime (WCC) and awareness in the public has only increased since being defined and operationalized in 1940. To date, researchers have not explored attitudes and perceptions of WCC among residents in the state of Utah, which is the only state to have a WCC registry, which may indicate public awareness of its severity. In this study, researchers explored the attitudes toward and perceptions of WCC among students from the largest university in the state of Utah. This study is unique in the WCC literature as the research is the first to leverage self-report measures of perceived probability of crime victimization to explore attitudes and perceptions toward WCC. Our findings show that over 80% of participants rated WCC as affecting some to a major portion of the population. The results indicate, interestingly, that the neither ethnic background, sex, religious background, amount of education (high school through advanced degrees), nor personal views on social or economic issues (conservative through liberal) had any statistical differences in rating the self-assessed probability of being a victim of WCC. Although not typically related in US public perception, participants who feared WCC also feared street crime. Those who felt that WCC was difficult to investigate and prosecute also had increased fears of WCC. Additionally, blue-collar workers had significantly less fear of WCC than white-collar workers or those whose main occupation was student. In terms of marital status, divorced persons had a significantly increased fear of WCC versus those who were currently married, single, or engaged. Overall, we also found support was high for the WCC registry across ethnic backgrounds, job category, and political views.

Title: Modeling and Predicting the Underpricing of Initial Public Offerings using Machine Learning Algorithms
Authors: Noah T. Brown, James C. Brau, Craig Thorsen
Affiliation: Brigham Young University
Abstract: Initial public offerings have historically demonstrated three phenomena that continue to persist as puzzles. They are the initial underpricing of issues on average; the cyclical nature (or hot markets) of both volume and underpricing; and negative risk-adjusted long-run stock returns persisting for at least five years

(Ritter 1991; Loughran and Ritter 1995). Much research has been published on these financial phenomena, with initial underpricing perhaps drawing the most attention. To date however, no research that we know of has used machine learning to model and predict IPO underpricing. In this paper, we use advanced machine learning methods to first fit, then train, and then out-of-sample test the prediction of IPO underpricing. The equation for the initial underpricing is: Initial Underpricing = [(Closing stock price on the first trading day)/(IPO offer price). This equation is dynamic in nature in that both the numerator and denominator can change up until the moment the IPO goes effective. The tools of machine learning allow us to train our model to predict both parts of the ratio and to achieve a predictive accuracy confidence interval that is significant in within sample testing. We use a sample of IPOs drawn from the SDC New Issues Database and supplement it with CRSP and Compustat data for a period from 1980-2019.

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Title: Business Ethics Education in Utah: How Are We Teaching Ethics and Why?
Authors: Chelsea M Dye, Charlotta Farr, Dara Hoffa, Ron Mano
Affiliation: Westminster College
Abstract: In an article on why business ethics need to receive greater prominence, Clayton Browne noted that although the study of general business topics like marketing, accounting, finance, and management are important to business education, it is equally important to have a real understanding that how you operate your business reflects not just on you, but impacts your neighbors and the larger community (Browne, Clayton. The Reasons for Studying Business Ethics. Small Business - Chron.com. Retrieved from http://smallbusiness.chron.com/reasons-studying-business-ethics-18877.html) Although higher education for business looks to agree that ethics education is important, the method by which we impart this education varies greatly. This paper examines the business programs at each of the eight institutions included in the Utah System of Higher Education in addition to the three non-profit private institutions in Utah and looks at the extent to which ethics is included in the business curriculum and the importance each institution places on business ethics curriculum.

Title: The State Treasurer Needs an Intermediate Maturity Fund: A Discussion of Investment Options Needed to Compliment the PTIF
Authors: R. Neil Walter, Nathan Caplin
Affiliation: Snow College
Abstract: The Treasurer's office has focused on the performance of the PTIF while its participants have been depositing long-term cash in the in the Treasurer's short-term investment vehicle. Sophisticated state entities invest longer term on their own. It is time for the Treasurer to put together an intermediate maturity fund that would create a higher return investment option for counties, cities, school districts, universities, charter schools, and other entities of the state that do not have the ability to manage a similar long-term investment strategy. The combination of the existing PTIF and a new intermediate maturity fund could materially increase cash dividends to the fund participants without requiring the Treasurer to take on additional credit risk.

Title: Earnings Management Surrounding Seasoned Equity Offerings: A New Method for Measuring Abnormal Accruals
Authors: Paige Perkins, James C. Brau
Affiliation: Brigham Young University
Abstract: In this paper, we propose a new metric for measuring abnormal accruals to determine if the Teoh, Welch, and Wong (1998) findings still hold validity. Because of the construction of our new abnormal accrual metric, we are constrained to use SEOs to operationalize our hypothesis. In studying SEOs rather than IPOs, we also address the conjecture of Ball and Shivakumar (2008) that "upward-biased estimates of discretionary accruals occur in a broad genre of studies on earnings management around similar large transactions and events." The essence of our new metric is that instead of using other firms in the same industry to measure the normal amount of accruals (e.g., Jones (1991) and its perturbations), we use the same firm's earlier non-event years to serve as the benchmark. In this regard, our measure is similar to the market model for stock return event studies (e.g., see Fama, Fisher, Jensen, and Roll (1969)) for a seminal article). When abnormal returns

are desired for event studies, it has become common to estimate a single factor asset pricing model in a pre-estimation period and then to use this model to estimate the normal return for the stock. In the market model approach, the normal measure is subtracted from the observed measure and the residual is considered either over or under performance. In much the same manner, we estimate expected accruals for each firm during a pre-estimation period that is not confounded by equity issuance. We then subtract this estimate from the observed accruals and compute abnormal accruals. Using our new approach, for a sample of 3,874 SEOs, we document that on average, firms inflate their earnings immediately prior to the offering. In addition, our new measure displays the best predictability of future long-run returns when compared to industry-matched benchmark approaches.

Title: Integrating Scrum Methodology Principles into Undergraduate Marketing Course Design
Authors: Nelson Altamirano, Benjamin Hart
Affiliation: LDS Business College
Abstract: The aim of this paper is to set forth in detail the experiences developed in undergraduate marketing courses from LDS Business College, where Scrum Methodology principles were adapted as the primary teaching approach. These principles include a team-based, power-balanced, and goal-oriented framework, self-organized teams, transparency, inspection, adaptation, and values of commitment, courage, focus, openness, and respect. This methodology has been used successfully in software development and has lent itself in various other fields including education where the inherent iterative and interactive approach of the methodological principles may facilitate learning. Since 2018, LDS Business College has integrated Scrum Methodology principles into two marketing courses: Digital Marketing Strategy and Digital Marketing Analytics. Data from students in those courses are collected at the end of each semester through voluntary surveys about how students viewed their experiences. While student responses varied, most students expressed that they would take similar courses in the future. Additionally, instructors who taught using the Scrum methodology principles have expressed that their experience has been primarily positive and shows potential as a teaching approach. These results suggest that there is an opportunity to refine how the Scrum methodology principles effectively engage students in the learning process. We provide recommendations to other educators about how to effectively integrate these principles in the instruction of courses in marketing, business, and other disciplines.

Title: An Econometric Analysis of Diversity: Perceptions of Undergraduate College Students towards Corporate Social Responsibility Metrics
Authors: Finnegan McKinley, James C. Brau
Affiliation: Brigham Young University
Abstract: The focus of this study is to examine college student perceptions of diversity issues. We use a sample of 1,149 students and ask questions pertaining to how important diversity is in their ideal first job. The dependent variables are derived from a corporate social responsibility database and focus on diversity issues. We employ a set of econometric tests to find correlations between demographic independent variables and an LGBT-dependent variable and a Diversity Index–dependent variable. The tests show that gender and political affiliation are robustly correlated with both dependent variables. Diversity is a factor that becomes more and more important for employers every year (Wentling and Palma-Rivas, 1998). Specifically, a common goal of modern companies is to provide a diverse and robust workplace for their employees (Ferris, Frink, Galang, 1993). The purpose of this study is to empirically explore how college students feel about diversity in their first job. The tests support two of our proposed four hypotheses in the way predicted. Women and people with liberal views tended to find diversity more important in their jobs. However, the two test results that surprised us most were from students whose parents both graduated from college and students who had lived outside of the United States. For example, students who lived outside of the US for extended periods did not find it as important that their jobs support the LGBT community. Women and liberals valued diversity as a whole, while children of college graduates and conservatives thought it was not as important. As the literature indicates, diversity in the workplace can bring tremendous value (Krishnan and Park, 2005 and Opstrup and Villadsen (2015)), and our results hopefully add to the discussion along the dimensions of what college students think about diversity prior to joining their first job out of college.

Title: Did Global Financial Crisis have Impact on Credit Unions Risk Performances? Evidence from Utah
Authors: Abdus Samad, Duncan Chritensen
Affiliation: Utah Valley University
Abstract: Credit unions are different breed of financial institutions. They are distinguished from other financial institutions. Credit unions are small, not-for-profit, and tax-exempt cooperatives. They provide financial services to their members who have common bonds with associations. By law, credit unions' loans are limited only to their members, not to corporations or institutions. They have small capitals but are large in

numbers. They are basically small community banks. Credit unions, being community banks, play an important role in mobilizing households' savings and channeling them to meet the needs of their members in buying cars, homes, tools, and equipment. In Utah, there are 119 credit unions operating side by side with other commercial banks. They provide a variety of services to meet the common needs of the community. Among important services, credit unions provide a variety of loan services. Based on the purpose of loan consumers borrow for or type of loan they need, loans of credit union can be classified into either residential loans or non-residential loans. Residential loans and non-residential loans of credit unions are the important source of income of credit unions and they also provide sources of risk to credit unions. Loans suffer from various risks. Loans default risk, non-payment of loans in due time, is very common. Credit risks, nonpayment of loan, affect profit performances of credit unions. The global financial crisis (GFC) of 2008-2010 had serious impact worldwide. The GFC had a catastrophic impact on the U.S financial institutions and the economy. There were large bank failures. In the U.S., the numbers of bank failures were 140 and 157 during 2009 and 2010, respectively. In the context of such a large U.S. bank failure, it is worth exploring the risk performance of Utah credit unions—small credit unions (SCUs), medium credit unions (MCUs), and large credit unions (LCUs) in particular. A Google search finds no evidence of study of the impact of the GFC on Utah credit unions' risk performances, particularly the GFC comparative impact on the SCUs, MCUs, and LCUs. As there were no studies on the impact of the GFC, the study of the GFC impact on the risk performances provides an important contribution in the literature of credit unions, at the state level in particular. The paper is structured as: Survey of literature is provided in Section 2; Section 3 outlines data source and the methodology; empirical results are provided in Section 4; conclusions are provided in Section 5.

Title: An Empirical Examination of the Marketing of Initial Public Offerings
Authors: Whitney Holman, James C. Brau
Affiliation: Brigham Young University
Abstract: Whereas prior literature extensively documents the initial and long-run performance of IPOs, the marketing of IPOs is rarely covered in prior literature (Demers and Lewellen (2003)). The principal focus of this study is to identify statistically significant factors associated with artificial demand created by the marketing of IPOs that affects the short- and long-term returns of IPO issues. We examine the selling efforts of brokers and dealers (Push Hypothesis) and the use of offer price adjustments (Impresario Hypothesis) as marketing tools in small and large issues, respectively. In the Push hypothesis, brokers and dealers may experience incentives to sell shares to less informed, unsophisticated investors, creating excess short-term demand. In the Impresario hypothesis, an increase in the offer price of the issue may be an alternate selling mechanism that creates the appearance of strong aggregate demand. We use the data drawn from SDC's New Issues database with offer dates between 1981 and 2016 as well as corresponding first-day, one-year, and three-year returns drawn from CRSP. We then use a portfolio approach and a series of OLS regressions to test the impact of artificial demand from the Push Hypothesis on small issues with unsophisticated investors, as well as from the Impresario Hypothesis on large issues with sophisticated investors. Our empirical results support both hypotheses in the presence of these marketing mechanisms, specifically for selling efforts in small issues with unsophisticated investors and for increased offer price in large issues with sophisticated investors. Our results are also consistent when these marketing mechanisms are absent: small issues that are not pushed into the market and large issues that do not raise the offer price experience less first-day return and do not experience poor long-run performance.

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Title: Work-Life-Balance Characteristics as a Predictor of Job Satisfaction across Generations
Author: Danielle Hardy, Annie Arvizu, Jace Johnson, Spencer Powell, Jonathan Westover
Affiliation: Utah Valley University
Abstract: Objective: The purpose of this paper is to explore work–life balance predictors of job satisfaction across various generations, using an international sample of workers across 37 countries. The four generational cohorts included in the analysis include Silent Generation, Baby Boomers, Generation X, and Millennial. Design/methodology/approach: This study provides a comparative analysis of work–life balance indicators of overall job satisfaction across generational cohorts, utilizing data from the 2015 Work Orientations IV Wave of the International Social Survey Program (including stratified random samples of employees across 37 different countries). Findings: Initial analyses indicate statistically significant differences in work–life balance related indicators of employee job satisfaction across generational cohorts. Additional analyses will be performed to clarify these relationships and further explore the causes behind the differences. Originality/Value: While thousands of studies have been performed on job satisfaction, very few studies have

explicitly examined job satisfaction levels and its indicators across generations. Additionally, while many studies have examined the role of work–life balance saliency on job satisfaction across generational cohorts, and no research has previously been done examining these relationships cross-nationally.

Title: The Effect of State Disclosure Status on Housing Markets
Authors: Spencer Evans, Barrett Slade
Affiliation: Brigham Young University
Abstract: The western United States presents an interesting case in analyzing the effect of disclosure status on residential real estate markets. Idaho, Utah, and New Mexico are non-disclosure states, meaning real estate agents are not required to disclose transaction data. The multiple listing service (MLS) controls access to transaction data, and in these non-disclosure states the data is Alternatively, Arizona, Colorado, and Nevada are disclosure states, meaning all real estate transaction data is public. This creates a natural test of market efficiency because buyers are acting on imperfect information and real estate agents are not incentivized to provide market transparency. We hypothesize that homes cannot be priced correctly in non-disclosure states, representing a market inefficiency. This asymmetric information could be detrimental for buyers and have serious implications for household wealth. The National Association of Realtors (NAR) is the organization that develops and maintains the MLS. The NAR is also the second-largest lobbyer in the United States. One potential source of data to start to understand the setting of the effect of disclosure status on real estate markets is to look at lobbying expenditures in non-disclosure states by the NAR. We expect to find that the NAR has significant lobbying presence in non-disclosure states because transparency is not beneficial to the NAR.

EDUCATION ORAL

Title: Networks of Solidarity in College Housing for Indigenous Youth
Author: Elhom Gosink
Affiliation: Westminster College
Abstract: College is a different experience for indigenous students, especially at predominantly White institutions (PWIs) so the solidarity networks that students of color create become a major part of their success (Boettcher, Earnest, Eason, & Lewis, 2019). Currently, there is a lack of interdisciplinary discussion on how culturally relevant housing and support networks in PWIs could benefit indigenous students. Indigenous students have some of the lowest retention and graduation rates; in fact, a study conducted in the 1990s found that only 1% of university degrees conferred in the US were to indigenous peoples and that indigenous youth have the highest dropout rates of any ethnic group (White Shield, 2004). Institutions of higher education have paid little attention to recommendations for support partly because of structural coloniality and the neoliberal capitalist economy. Research has shown how campus housing can support college-wide retention efforts, so it follows that institutions must pay more attention to the experiences of indigenous youth, listen to their complex histories, and value their culture in order to create more supportive programing (Arensdorf, Naylor-Tincknell, 2016). This paper synthesizes some of the existing literature to construct a critical, interdisciplinary examination of college housing requirements; synthesize the recommendations made by indigenous scholars that are explicitly concerned with the success of indigenous students; and examine the structural challenges to institutions of higher education by utilizing currently isolated research from land-based pedagogy, communities of self-selection, and the importance of peer networks for students of color in higher education.

Title: Facilitating Engaged Student Learning: Seven Principles for Instruction in Undergraduate Marketing Courses
Author: Benjamin Hart
Affiliation: LDS Business College
Abstract: Can marketing instructors influence their student's desire to learn? Can we identify how to use student–teacher interaction in a classroom environment to affect their motivation? From 2018 through 2019, students in 18 marketing courses at LDS Business College anonymously answered questions about their learning experience. Their responses revealed what events occurred during their classroom instruction that they felt motivated them to learn. Responses were organized into categories based on the nature of the events they described. Each category suggested a common theme for the responses. These themes were organized into seven principles supported by existing research in education and learning: Incentive, Inclusion, Immersion, Integration, Interaction, Iteration, and Inspiration. It is suggested that adapting these seven principles as a foundation for curriculum design will positively influence a student's desire to learn. Recommendations on how to implement each of the seven principles in a classroom environment are provided. Further research in this area is needed to demonstrate the effectiveness of the seven principles to increase student's desire to learn in other disciplines.

Title: Creating a Successful Secondary Dance Program in Any Community
Author: Nichole Ortega
Affiliation: Utah Valley University
Abstract: Through the study of dance education and dance advocacy, the relevance and importance of successful secondary dance programs has been proven time and time again, especially concerning the positive outcomes for participants and school communities. These same programs can also be used as an extremely effective learning tool for future dance educators, specifically in navigation of diverse learning environments. As a result of several years of observation and evaluation of Dance Education majors during their student teaching assignment, it became evident that students were aptly prepared to teach dance curriculum in the secondary schools but often struggled with the diverse situations and/or environments they were assigned. Every secondary school requires modifications of best pedagogy practices for optimal learning in that specific environment. As a result of my 10 years as a secondary dance educator and 13 years as a university faculty member involved in a Dance Education program, I am aware of several successful secondary dance programs throughout the state of Utah and some in surrounding states, all with distinct environments. In this presentation, I will be sharing my research based on interviews of over 20 secondary teachers with successful dance programs and the specific elements of these diverse programs. The goal of this research is to provide helpful information for enhanced Secondary Dance Education pedagogy practice at the university level, allowing future dance educators more success in their student teaching and professional teaching assignment.

Title: A Comparison of Experiential Project and Learning Outcomes for Students in an Online Organizational Development and Change Course
Author: Jonathan Westover
Affiliation: Utah Valley University
Abstract: In the fall of 2019, I launched a new fully online version of my Organizational Development (OD) and Change service-learning class, which includes an intensive, semester-long service-learning consulting project that teams of students complete with a community partner. I have been teaching this class for 9 years, in both the traditional F2F and hybrid modalities, but I decided to design an online version to provide more options for our students. The challenge has been to find ways to retain the heart of the course, a meaningful and effective service-learning OD team project consulting experience, within a fully online course. This research compares student learning reflections and various service-learning project outcomes in this new fully online course versus the previous hybrid version of the class. Personal learnings and reflections on how to improve future versions of the online course will be shared.

Title: Greater Rudeness: Interruptive Behavior in the Graduate School Classroom
Author: Thomas C. Terry
Affiliation: Utah State University
Abstract: Professor Fiona Draper surveyed the classroom filled with M.A. and Ph.D. students, ignoring vocal outbursts by two men. She gestured to a woman. “Studies have shown that men interrupt women more often than women interrupt men,” she said, “and are more forceful and loud in classroom situations. So, Sandy, you go right ahead.” Draper provided the premise for this study exploring whether male graduate students do attempt to dominate and interrupt female graduate students in classroom situations. Interruptions are defined as speaking without raising a hand, blurting out comments or questions, “stepping on” those speaking, and talking over others, as well as similar behaviors. Research was conducted in a southern university’s research methods class of 16 men and 11 women taught by a female professor over two 75-minute periods. In this preliminary study, results were mixed. Percentagewise, men and women interrupted others without raising their hands at virtually the same rate. However, men did talk over others in the class nearly twice as often, but were also twice as likely to raise their hands and wait to be called on by the professor. Women half-raised their hands before interrupting far more often than men. Overall, men’s approach to the class seemed informal, and they appeared less engaged. A third were not closely following the flow of classroom discussion. In sharp contrast, women seemed connected and always fully aware of the flow of conversation. However, women made fewer comments, percentagewise. When women left the classroom during class, they did so quietly and closed the door carefully, unlike the men, who let the doors slam shut behind them. The researcher concludes that further research is indicated to create a more nuanced and comprehensive answer to the study’s hypothesis that men’s classroom behavior is more interruptive.

Title: From Start to Finish: The Implementation of Campus-Wide Integrative Equity Training and Programs
Author: Lianna Manibog
Affiliation: Snow College
Abstract: We will begin with a platform presentation establishing the distinct student environment at Snow College, which is a rural, predominantly white, predominantly Latter-Day Saint student demographic. In doing

so, we will demonstrate the unique profile and history of our college, even within the state of Utah. We will use data and personal experiences to illustrate the marginalized status of first-generation, financial-need, as well as certain minority and racial groups of students, and we will end with an argument for how campuses can better support these students from the moment they set foot in our classrooms to the day they depart. Furthermore, we will discuss a campus-wide plan of integration that allows for better communication between faculty, administration, advisement, and service-learning groups on campus. We will include a list of programs and structures that are currently being discussed as solutions to issues these students face. We will also make the case for our responsibility to prepare diverse students to the best of our ability and give the resources they need for success. As Ta-Nehisi Coates argues, "No one directly proclaimed that schools were designed to sanctify failure and destruction. But a great number of educators spoke of 'personal responsibility' in a country authored and sustained by a criminal irresponsibility. The point of this language of 'intention' and 'personal responsibility' is broad exoneration. "Good intention is a hall pass through history, a sleeping pill that ensures the Dream." Finally, we will conduct an interdisciplinary workshop targeting faculty who are seeing firsthand the DFWI (D, Fail, Withdraw, Incomplete) rates being problematic in their courses. We will encourage attendees to work together to identify needs & methods to create equitable practices within their own discipline with an opportunity to brainstorm what these practices might look like & how they might function.

ENGINEERING ORAL

Title: Heat Transfer Analysis of Water During Liquid-Solid Phase Change
Authors: Kelly Lou Pelicano, Colton Robinson
Affiliation: Southern Utah University
Abstract: To better understand the heat transfer through materials undergoing a phase change, experiments were conducted using eicosane as it went through the freezing process. Liquid eicosane at 50°C was placed in a cylindrical test vessel and cooled from the outer surface of the vessel utilizing a counter flow heat exchanger. The heat exchanger provided constant temperature cooling by means of a constant temperature bath system. An initial analysis of the data showed that a steady fusion temperature of ~35.6°C was achieved before the eicosane solidified. Analyzing the temperatures recorded by the thermocouples, detailed quantitative time-dependent volumetric temperature distributions, freeze-front motion, and shape were obtained. Under idealized conditions, the phase-change material (PCM) behaves as a thermal lumped capacitance, providing cooling (or heating) for a wide range of heat transfer rates at a single temperature corresponding to its melting-point (fusion) temperature. In practice, this temperature exists only at the solid/liquid interface. As the PCM freezes, the interface moves away from the surface of the heat source, and a thermal resistance layer is built up, resulting in a reduced heat transfer rate and/or increased temperature difference between the system to be cooled and the PCM. Results have been generalized to apply to any low-Stefan number PCM. By examining the data collected from this experiment, the phase change behavior of eicosane was characterized.

Title: Mechanical and Thermal Properties of Concrete
Authors: Craig Olson, Nathan Tyler
Affiliation: Southern Utah University
Abstract: Concrete is a popular building material used in all types of structures such as roads, bridges, homes, and other structures. Knowing both the mechanical and thermal properties of concrete are very crucial to the construction of structures in various environments. In this undergraduate research performed at Southern Utah University, the mechanical (failure stress at several periods of times after pouring) and thermal properties (heat generation rate and thermal heat capacitance) of type IV concrete were experimentally evaluated from a premixed bag purchased locally. The experimental values were compared with the published values. The compressive strength of concrete specimens depends highly on slumps and also relates to the heat generation rate (heat of hydration) and thermal heat capacity associated with the initial curing process. In this research, for the heat transfer evaluation, a cylinder (10-in diameter by 10-in height) was used, and the cylinders used for the compression testing were standard 4-in diameter by 8-in height. Cylinders were placed in "hot, "ideal," and "cold" environments to mimic the real pouring environments. The compressive strength of the concrete was evaluated to be higher when the initial curing process was ideal rather than hot and cold. The experimentally evaluated heat generation of the concrete to evaluated to be 57.89 cal/gram which placed it as type IV concrete when compared with other published data.

Title: Analytical Solutions to Predict the Thermal Conductivity of a Phase Change Material in a Cylindrical Coordinate System
Authors: Kelly Lou, Pelicano, Emmanuel Navarro, Vicki Krull, Ali Siahpush
Affiliation: Southern Utah University
Abstract: In authors' previous research, inward freezing of eicosane was investigated. Experimentally radius

of fusion and calorimetric heat tranter analysis were performed. In this paper, we analytically predict the inward freezing of a phase change material system, eicosane ($C_{20}H_{42}$), in a cylindrical enclosure. A quasi-steady-state heat transfer analysis was conducted, and the experimental results were compared with theoretical predictions. The heat transfer analysis consisted of (1) implementing a calorimetric heat transfer measurement with eicosane to ensure that the system was functioning properly; (2) using mathematical heat balance integral method to present a detailed quantitative heat transfer analysis and radius of fusion location; and (3) predicting the eicosane thermal conductivity. We also will discuss how the analytical and experimental results support one another by presenting mathematical models that yielded time-dependent volumetric temperature distribution and freeze-front motion distribution plots. Predictions from previous experimentation are also presented to further validate the results of this work.

Title: Material Properties of Photopolymer Resin, Polylactic Acid, And Other 3D Printing Materials
Authors: Austin Rohrer, Teigen Jewkes, Zach Jensen, Jacob Pastorik
Affiliation: Southern Utah University
Abstract: In this experiment, we tested and studied the mechanical and physical properties of thermoplastic PLA (polylactic acid) filament and thermoset photopolymer resins by exercising the material bonds in the form of tensile stress evaluations. The 3D Filament used in the primary dogbone tests were all PLA material. For comparison, secondary tests were ran on PLA, ABS, PETG, and Carbon Fiber PLA strands of unprinted 1.75-mm diameter wire. For additional comparison, tie wire and braided-steel cable were also used in the secondary test. These secondary tests were conducted to study the difference between unprinted and printed materials and how the bonds change the mechanical properties of the sample materials.

Title: Tensile Properties and Thermal Conductivity of Fused Polylactic Acid Polymers
Authors: Anthony Cole, Aaron Dockins, Kyler Reinhold, Austin Banks, Ali Siahpush
Affiliation: Southern Utah University
Abstract: The study performed in this paper is part of the undergraduate research performed at Southern Utah University. The research includes evaluating the basic mechanical and thermal properties of the common printing material PLA (polylactic acid). The tests include tensile strength in the three orthogonal orientations and experimentally evaluate the coefficient of thermal conductivity for the material. The samples were strongest when printed with layers parallel to the direction of the applied load. The thermal conductivity for the material is 0.134 $\frac{W}{m.K}$ where, according to the SD3D Technical Data Sheet, the published thermal conductivity is 0.13 $\frac{W}{m \cdot K}$.

Title: Thermoelectric Devices: A Study of Material-based Efficiency and Operation
Authors: Spencer Bain, Ryan Dungan, Nate Hirst, Kaiyuan Sun
Affiliation: Southern Utah University
Abstract: The purpose of this experiment was to determine the performance of different thermoelectric devices by comparing efficiency based on material selections and device configurations. Dissimilar semiconductors create a relation between heat flux and electricity in the thermoelectric junction based on the Peltier Effect. The most common materials are bismuth alloy (BiSn), bismuth telluride (Bi_2Te_3), antimony telluride (Sb_2Te_3), and bismuth selenide (Bi_2Se_3). An apparatus consisting of two cooling blocks, two thermoelectric devices, and two heaters was used to conduct the experiment. A steady-state temperature differential was maintained by ceramic plate heater on the hot side and an aluminum cooling block on the cold side. Multiple configurations were tested for power generation at a variety of temperatures. The maximum efficiency of the thermoelectric generator was measured to be around 5.6%, and the published maximum efficiency from the manufacturer was listed as 5.03%. Multiple devices were tested in an attempt to draw connections between material combinations and efficiency for the thermoelectric coolers or generators. Although the test apparatus provided consistent and relatively accurate data, the raw material combinations and manufacturing methods used for thermoelectric devices are proprietary. However, a comparison between different thermoelectric devices showed a correlation between the intended application of the device and the efficiency when used for power generation. When used for power generation, the thermoelectric devices intended for heating and cooling were consistently less efficient than the devices that were purpose-built for power generation.

Title: Experimentally Evaluating Solar Flux and Absorptivity of a Plate through Radiation Heat Transfer
Authors: Landen Measom, John Webster, Inoa Wahinehookae, Chris Zeman
Affiliation: Southern Utah University
Abstract: The first objective of this project is to evaluate the solar flux in Cedar City, Utah, by conducting radiation heat transfer tests with aluminum and steel sheets. This information is then utilized to calculate the absorptivity of the two metals. The results are compared with published values. The solar flux values calculated using the aluminum and steel sheets are within 4.23% and 4.48% of the values reported by a solar field approximately 10 miles west of the test location. From these solar flux values, the absorptivity of each

material was approximated using numerical methods in MATLAB. The calculated absorptivity of each fell within the published values.

Title: Applications of Knowledge Management in Construction Companies to Improve the Performance Indicators
Authors: Mohamed Askar, Mason Timmerman, Bryant Ward
Affiliation: Southern Utah University
Abstract: Knowledge management is the identification, optimization and active management of intellectual assets to create value, increase productivity, and gain and sustain competitive advantage. Knowledge management is essential in the construction industry, but there is a dramatic gap between rhetoric and reality, highlighting mistaken expectations of technology. The construction industry depends on human knowledge, with limited systems support. A significant obstacle to the broader acceptance of knowledge management in most of the construction companies is that the management of these companies finds it difficult to recognize any concrete benefit for their day-to-day business to be gained from applying existing knowledge management concepts. It is vital for construction companies to win orders in a competitive environment and to execute these orders profitably for the company and satisfactorily for the customer (project success). The study aims at evaluating the current knowledge management situation of the construction industry, recommending the next steps in implementing knowledge management that can be taken by construction companies and studying how they can benefit from the existing resources of knowledge management. The fundamental prerequisite to enable this approach is to activate their success factors. The paper proposed an applicable Knowledge Management System (PKMS) for construction companies that covers inputs, processing and outputs. The PKMS aims at increasing the value of the intangible assets of construction companies.

Title: Problems Facing Parties Involved in BOT/PPP Projects in the USA—Case Study: Cedar City, Utah
Authors: Mohamed Askar, Jared Baker; Gray Christian; Tyler Ercanbrack
Affiliation: Southern Utah University
Abstract: One of the newest financial schemes for the infrastructure projects is the BOT (Build, Operate and Transfer) concept, which is being used increasingly nowadays all over the world as a project delivery system, by which governments deliver the infrastructure projects through private sector after a concession period free of charge. The United States has been committed to the free-market economy principle since its establishment, and it has guaranteed freedom of economic activity to its people. The policy of transferring government enterprises and corporations into private sector ownership and management has gained substantial significance in recent years in the US. The state of Utah is encouraging the private sector to participate in the development of infrastructure facilities such as railway, airports, power plants, water supply facilities, ports, etc. In an attempt to reduce its spending, the State is attracting private capital in increasing volumes to overcome the financing limitations. Increased private sector participation will help in the realization of large-scale infrastructure projects with minimum burden on the State. The study aims to investigate the potential for implementing the BOT approach in Utah. This can be achieved by giving a clear view of BOT, its problems, risk areas, and features found in Utah to maximize the benefits and minimize the risks as much as possible. Data about the required critical success factors to achieve BOT projects in Utah were collected, analyzed, compared with the actual risks, and concluded.

KINESIOLOGY AND HEALTH SCIENCES ORAL

Title: Intermittent Fasting as an Alternate Method of Fat Loss: Altering Body Composition in Competitive Physique Athletes
Author: Kasey Giles
Affiliation: Brigham Young University
Abstract: Physique athletes (e.g., bodybuilders and bikini competitors) are judged on aesthetics, which is why they aim for a low body-fat percentage and a lean, hard appearance. After a few months of muscle building, known as the “bulking” period, competitors follow a strict regime to “cut” body fat. Men usually try to drop anywhere from 3% to 6% body fat for competitions, and women aim for an 8–11% body fat range (Bell, 2019). Bodybuilders and bikini competitors must rely on nutritional habits to edge out other competitors and bring themselves to a lower body-fat percentage. These athletes often rely on continuous energy restriction (CER) to alter body composition by cutting more calories out of their diet every few weeks. CER, while being able to recompose body structure, has also led to decreases in performance and energy levels. Athletes will push their bodies to the limit in the “cutting” stage; CER will often bring caloric intake to unhealthy levels (often a sub-500 caloric deficit) to decrease body fat in a short amount of time. Not only does CER cause athletes to lose energy while in the preparation of a competition, but it also causes them to rebound after competition (potentially destroying them psychologically). Intermittent fasting (IF) has recently gained a lot of

traction in the media as a nutritional habit that leads to increased fat burning while maintaining energy levels. IF, or intermittent energy restriction, alternates times of energy restriction (fasting) with times of energy consumption (feeding). Athletes who chose to replace CER with IF can lose fat and maintain muscle while maintaining a healthy and consistent daily caloric intake. IF aids athletes in body composition by increasing the human growth hormone, decreasing insulin spikes, and maintaining basal metabolic rates.

Title: Factors that Increase the Effectiveness of Active Rehabilitation in the Treatment of Post-concussion Symptoms: A Review
Authors: Alexa Katrena Bowns
Affiliation: Brigham Young University
Abstract: The treatment of ongoing post-concussion symptoms with active rehabilitation is a complex and multifaceted topic. Past studies recommend physical and cognitive rest as the most effective treatment for post-concussion symptoms. Current emerging studies show the benefits of active rehabilitation treatment. This review focuses on the specific factors that make active rehabilitation the most effective in the treatment of post-concussion symptoms. Awareness of circumstantial factors that increase symptom recurrence with exercise is of importance when prescribing active rehabilitation as a post-concussion symptom treatment. Treatments that begin 2 to 3 weeks after injury that include light to moderate intensity graded exercise regimens are most beneficial. Additionally, treatments that include a variety of exercises such as aerobic, strength, and skill training are likely to be advantageous.

Title: The Relationship between Physical Activity and Smokeless Tobacco Use among Adults in the United States: A Systematic Review of the Literature
Authors: Linnette Wong
Affiliation: Weber State University
Abstract: Objective: To synthesize published literature that has tested the relationship between physical activity and smokeless tobacco use. Data Source: A systematic review of literature published between January 2007 and December 2017 was conducted by searching the databases: PsychInfo, Medline, and CINAHL Complete. Study Inclusion and Exclusion Criteria: Inclusion criteria: must have tested for the relationship between physical activity and smokeless tobacco use; adult samples in the US. Exclusion criteria: utilized samples from outside the US, adolescents, or tobacco dependent and heavy smokers. Data Synthesis: The search captured 81 unique articles, 6 of which were included in the final systematic review. Results: 40% of the studies reported a positive relationship between physical activity and smokeless tobacco use. Conclusion: Research published in the past decade implies a positive relationship between physical activity and smokeless tobacco use. Findings have important implications for the design of health promotion programs targeting physical activity and smokeless tobacco use.

Title: Serotonergic Hallucinogens' Antidepressant Potential: A Comparative Review of Serotonergic Hallucinogens and Ketamine
Author: Ethan Ouzts
Affiliation: Brigham Young University
Abstract: Ketamine was recently approved by the U.S. Food and Drug Administration as a therapeutic approach to treat individuals with treatment-resistant depression. This approval opens the door for other hallucinogens to be approved for psychiatric use. This review compares the antidepressant potential and safety of serotonergic hallucinogens, such as lysergic diethylamide acid (LSD), with those of ketamine, the standard of comparison in this review. Serotonergic hallucinogens demonstrate similar short to mid-term reductions in depressive symptoms for patients with depression, and these drugs may be safer than ketamine. Researchers should conduct additional randomized, controlled experiments to better establish serotonergic hallucinogens' antidepressant potential. Despite limitations in current research, serotonergic hallucinogens warrant serious consideration for potential antidepressant treatment.

Title: Lactate Threshold Analysis: Statistical and Practical Analysis; Pilot Study
Author: L Nathan Thomas, Kylie Cox, Angee Thomson, Teresa Taylor, Miliena Mitre, Jenny Pham
Affiliation: Salt Lake Community College
Abstract: Objective: The objective was to perform a pilot analysis of lactate threshold analysis protocols, identify lactate threshold, and compare statistical and practical differences between protocols and potential application of data for exercise prescription in nonathletic populations. Methods: In this research, 6 subjects underwent a LT, HR Def, and CP assessment. Recovery from CP to LT test was 3 days, while recovery between LT and HR Def was 8 hours. Data were collected and analyzed by the group. Conclusions and Findings: The use of LT is important for exercise prescription and adaptation for health**.**

LETTERS, LANGUAGE, & LITERATURE ORAL

Title: Poetic Shape: How Enjambment in Gwendolyn Brooks "We Real Cool" Evokes Visual Metaphor and Deeper Meaning
Author: Megan Alyse
Affiliation: Weber State University
Abstract: The poem, Gwendolyn Brooks' poem, "We Real Cool," is often one of the first poems we think of when discussing her work. The purpose of this paper is to explore the poem's functions of enjambment through the minimalist and cubist movements associated with visual arts. The poem originally appeared in Brooks' collection The Beans Eaters, a collection of ballads, sonnets, and near-sonnets outlining both fictional and imagined characters. Within this context, the poem's enjambment creates a musical embrace of culture despite the larger collection's resistance. My concern is with how minimalist and cubist impulses shape the poem, visually and musically, and enable its becoming a celebration of black language and culture.

Title: Lab Lit: What Happens to Character When Contemporary Science and Literature Cross Paths?
Author: Olga Pilkington
Affiliation: Dixie State University
Abstract: Up through the beginning of the twenty-first century, there was no name for the genre of fiction that deals with science in its present state, unembellished by the brilliant possibilities of the future. Only within the last two decades has this genre been named—"science-in-fiction" or "veri-fiction" (by Carl Djerassi) or "fiction about science" (by Charles Sheffield). The name that has stuck, however, and that is allowing the genre to flourish and gain scholarly recognition is "LabLit," a name coined by Jennifer Rohn. Focusing on two recent LabLit texts, Susan Gaines' Carbon Dreams and Jennifer Rohn's The Honest Look, I will show how elements of contemporary, non-futuristic science (including lab apparatus) expand or modify traditional characterization in English-language fiction.

Creative Fiction

Title: Address Trauma Through the Surreal Fictions
Readers: Lisa Christensen, Dallin Hunt, Chanel Earl, Madalyn McRae
Affiliation: Brigham Young University
Abstract: Four readers will read short pieces fiction in which magical realism as a means of examining how people respond to trauma, pain and grief.
"Moths of a Feather," a short story about tattoos and friendship beyond the grave
"Cheating," a series of flash fictions where death doesn't win.
"One Boy's Death," a ghost story featuring multi-generational connections and lighting.
"The Corpse's New Clothes," in which an obsessive distance runner finds an unusual trainer.

Title: The Truth of Beauty and the Beauty in Truth
Affiliation: Brigham Young University
Readers: Kalli Abbott, Carma Hilland, Thew Curtis
Abstract: Three readers will share original creative nonfiction and poetry employing lyrical memoir and quasi-confessional modes to explore how these sister genres explore and generate beauty in truth.
"On Fishing," a nonfiction essay
"Nuclear Folly," a nonfiction essay
"Epistolary Poems"

PHYSICAL SCIENCE ORAL

Title: Using Silver Nanoparticles to Detect Early Onset of Disease
Authors: Porter Wilkes, Payton Riggs, Hayley Phillips, Jonah Babbel, Payden Harrah, Christopher F. Monson
Affiliation: Southern Utah University
Abstract: Silver nanoparticles are of interest because of their chemical, antimicrobial, and other properties. We have developed a method to fabricate silver nanoparticles using a microfluidic device made of PDMS. Through this method, we can consistently form high concentrations of nanoparticles of the same size and shape using common reagents for silver nanoparticle fabrication (silver nitrate, sodium hydroxide, ascorbic acid, and a specific capping ligand, which coats the outside of the nanoparticle, determining its final size and shape). Citric acid is commonly used as a capping ligand, but we have tested several non-conventional ligands, including common biological molecules. Specifically, we have compared a lipid (1,2-dioleoyl-sn-glycero-3-phospho-L-serine), a vitamin (vitamin B), and several proteins (BSA, Casein, and IgG) and have observed

differences in the nanoparticles produced when using these capping ligands. We can identify these differences by examining the nanoparticles' abilities to fluoresce using fluorescence spectroscopy. Furthermore, we have compared the nanoparticles fabricated using three significantly different concentrations of both BSA and Casein. We observed that the nanoparticles made from different concentrations of BSA fluoresced identically to each other and that the nanoparticles made from different concentrations of Casein did likewise, although, as found previously, the nanoparticles made from the distinct proteins fluoresced differently. We have also examined the nanoparticles formed from mixtures of BSA and Casein and have observed that these nanoparticles fluoresce differently than nanoparticles formed from each of the pure capping ligands, at a level between BSA and Casein. Our objective is to identify distinguishing features between the fluorescence of nanoparticles derived using different biological samples as capping ligands, with the vision that this research could lead to new methods of identifying diseases at early stages by comparing the fluorescence of nanoparticles fabricated from samples of subjects believed to have a disease to those who do not.

Title: Lead levels in the wing bones of Utah eagles, measured by x-ray fluorescence
Author: Michelle Arnold
Affiliation: Weber State University
Abstract: Lead is a known toxin for which adverse effects have been detected in both humans and animals, even at very low exposure levels. Eagles and other raptors are primarily exposed to lead through the presence of lead shot within game they ingest. There is only minimal data for lead levels of eagles in the United States or studies that have evaluated the resulting effects of exposure. Because of the long biological half-life of lead within bone, a measurement of bone lead levels can be used to assess lifetime exposure to the element. The non-invasive technique of x-ray fluorescence (XRF) was used to assess the bone lead levels for 10 eagles found dead in Utah (4 bald eagles and 6 golden eagles). Seven of the 10 eagles measured had elevated bone lead levels, >20 micrograms per gram of bone mineral. Four of the six golden eagles had levels in excess of 30 micrograms per gram, with the greatest measured bone lead concentration being 78.2 micrograms per gram.

Title: A Microfluidic Device for Oxygen Quantitation in Anoxic Environments
Authors: Mariah Clayson, Madison Evans, Christopher Abraham
Affiliation: Southern Utah University
Abstract: Anoxic environments provide a challenge for measuring dissolved oxygen concentration. Currently, the only commercially available method that has sufficient sensitivity to quantify the dissolved oxygen concentration in anoxic waters (<1% oxygen saturation) is the STOx Electrode. Using a three-dimensional design, we have developed a microfluidic device for measuring low levels of dissolved oxygen. The device is fabricated using a sacrificial magnesium wire to form a channel through PDMS, which allows the electrodes to be exposed to solution. Our initial design involved nine separate electrodes and three independently controlled applied voltages. To simplify our design, our new device allows for a three-electrode set-up, allowing the working electrode to reduce noise by acting as its own guard. A new pumping mechanism is also employed, allowing for a larger volume displacement at faster rates.

Title: Biological Molecules—Separation by Charge and Microfluidic Devices
Author: Ruthie Cicotte
Affiliation: Southern Utah University
Abstract: Microfluidic devices may be utilized to separate biological molecules by charge. The device being built in this experiment is intended to aid in separating DNA from a matrix of molecules quickly and efficiently. The method in which the device was constructed allows the analyte to flow through a narrow channel, with positive and negative charges on either side of the channel divided from the analyte by a frit. It is intended that the charges will pull DNA and other molecules towards them, in magnitude related to the molecules charge, essentially separating them from one another. It is anticipated that these devices may be used with raw samples of biological material and separate any DNA within the raw sample in the same manner it would isolated DNA, allowing biological material to be analyzed without DNA being isolated first. This could save an incredible amount of time in analysis and could potentially be used in criminal investigations, genetic research and other related fields.

Title: Ultrafast laser spectroscopy probes of macromolecules and their solvent environment at electrified solid-liquid interfaces
Authors: Rodrigo Noriega, Sasha A. Moonitz, Noah Shepard
Affiliation: University of Utah
Abstract: Probing electrochemically active interfaces with spatial selectivity and temporal resolution is a challenge that requires the combination of complementary experimental tools. To enable the spectroscopic and electrochemical characterization of macromolecular species at electrified interfaces in the condensed phase,

our group is extending surface plasmon probes into the time-resolved mid-IR domain. These new probes are designed to be compatible with in-situ electrochemical measurements and ultrafast fluorescence experiments. We demonstrate the ability to detect electric-field mediated adsorption of polypeptides at a semiconducting electrode, as well as subsequent pH- and electric-field dependent conformational changes in the adhered peptide layer and its solvation environment.

Title: Low temperature deviations from Arrhenius behavior of Kinesin-1
Authors: Flo Doval, Kassandra M Ori-McKenney, Richard J McKenney, Michael Vershinin
Affiliation: University of Utah
Abstract: Kinesin-1 is a mechanochemical enzyme that is essential for executing long-distance transport of cargos in eukaryotic cells via processive motility along the microtubule network. KIF5A is a conventional kinesin in the Kinesin-1 family. The temperature dependence of enzymatic activity for several kinesin-1 motors has been reported to follow a simple Arrhenius trend. The range for this observation has been gradually extended to higher temperatures, as it became possible to circumvent and, more recently, control kinesin degradation. However, both biophysical and biochemical measurements to date have been limited down to ~5°C. We investigated the enzymatic activity of KIF5A at even lower temperatures and have observed a break in the Arrhenius trend, corresponding to higher activation energy at lower temperature. We will report our investigations of this phenomenon in different biochemical backgrounds and discuss its cause as it relates to the nature of the rate-limiting step of kinesin's enzymatic cycle.

Title: Investigation into the dynamics of lipid membrane remodeling
Authors: Abhimanyu (Abhi) Sharma, Henry Nguyen, Nathaniel Talledge, John McCullough, Frank Moss III, Janet Iwasa, Michael Vershinin, Wesley Sundquist, Adam Frost
Affiliation: University of Utah, University of California San Francisco
Abstract: Lipid membranes play a key role in biology, enclosing entire living cells, as well as intracellular compartments. Cellular processes such as endocytosis, virus budding, and cytokinesis involve changes in membrane shape and connectivity. Membrane remodeling is essential, common, and tightly regulated. A variety of pathways, including the endosomal sorting complexes required for transport (ESCRT) machinery, are involved in locally changing membrane curvature (both invagination and evagination), tabulation, and scission. However, the mechanics of many of these remodeling events are still poorly understood. We have used an in vitro GUV system and investigated the details of membrane reshaping under local mechanical load and in several ESCRT protein backgrounds. We will discuss our results, which demonstrate how protein-based regulation can help remodel bilayer membranes.

Title: Continuous Trajectories in the Quantum Harmonic Oscillator
Authors: Matthew Lawyer, Jean-Francois Van Huele
Affiliation: Brigham Young University
Abstract: Bohmian mechanics is a formulation of quantum theory that describes particles having continuously defined trajectories. These trajectories give an intuitive picture of the dynamics of a quantum system. However, they are highly nonclassical. Numerically calculated trajectories for several states of the simple harmonic oscillator are shown, and nonclassical effects are explained in terms of an additional potential, called the quantum potential. The method of obtaining these trajectories is discussed, and a possible application of these results is explored.

Title: Designing a Universal Quantum Logic Gate: Deutsch Gate Circuitry with Two Quantum Dots and a Flying Qubit
Author: Paul Bailey
Affiliation: Brigham Young University
Abstract: The Deutsch gate is a three-qubit universal quantum logic gate, meaning that any quantum computing task can be completed using a combination of Deutsch gates. To our knowledge, no Deutsch gate has been experimentally realized so far. We store two qubits in the spins of two electrons confined to GaAs/InAs quantum dots and the third qubit in the polarization of a photon. This photonic qubit interacts with the quantum dots by travelling through the designed circuitry, thereby achieving the Deutsch gate. We discuss the challenges and feasibility of realizing these quantum gates.

Title: Robustness of a quantum algorithm in the presence of noise
Authors: Scott Johnstun, Jean-Francois Van Huele
Affiliation: Brigham Young University
Abstract: Quantum algorithms offer efficient solutions to computational problems that are expensive to solve classically. However, their implementation on quantum computers requires dealing with inevitable errors such

as noise and decoherence. We present a quantum implementation of Simon's algorithm for a simple toy problem whose quantum algorithmic solution enjoys an exponential speedup over any classical solution, and use noise simulation to analyze the effect of noise on the algorithm's effectiveness. We also compare results of noise simulations with implementations on a real quantum computer.

Title: Developing Selective Absorbers for Solar Water Heating; Undergraduate Materials Research at Weber State University
Authors: Kristin Rabosky, Colin Inglefield, Corey Collatz
Affiliation: Weber State University
Abstract: The materials group at Weber State University has been working with undergraduates primarily from the physics and chemistry departments on research projects that combine recipe design for materials growth, multiple characterization methods, and device testing. We present an example of cermet-based selective solar absorbers (SSAs) of SiO_2 with Mo incorporated through sputtering growth. The SSA layers and prototype water heating device were tested, and the growth method was refined in a scaled-down version of the iterative cycle of materials development. This exemplary project demonstrates the type of opportunities available to students in the materials program and opportunities for collaborative efforts with other Utah institutions doing materials research.

Title: Concentration Variation of Reagents on Silver Nanoparticle Production via a Microfluidic Device.
Authors: Cade Christensen, Brittany Christensen
Affiliation: Southern Utah University
Abstract: Microfluidic devices are devices that contain micrometer-scale channels through which liquids flow. These liquids behave differently on these scales than they do in everyday life. One example is that the liquids flow in defined sheets, called laminar flow, which means two liquids flowing next to each other won't mix until they are forced to. These flow properties can be utilized to mix solutions at a very specific time during the chemical process, such as during the synthesis of nanoparticles. Nanoparticles are particles, often of metals, that are typically between one and several hundred nanometers in size. On this scale, the nanoparticles behave differently than the bulk metal does. Forming a desired size of nanoparticles requires specific conditions, and this project aims to show how varying the concentrations of the reactants in a microfluidic device can improve or detract from the formation of silver nanoparticles.

Title: Solvatochromic Properties of Novel Molecules Structurally Related to Brooker's Merocyanine Dye
Authors: Jacob Newey, Kyler White, Mackay Steffensen
Affiliation: Southern Utah University
Abstract: Solvatochromism is a chemical property of some compounds that can change color, depending on what solvent they are dissolved in. Solvatochromic compounds can be used to predict the colors of solutions or predict suitable solvents for particular uses. Theoretically, they can also be used in sensors or molecular electronics to construct molecular switches. The most well-known solvatochromic compound is an organic dye called MOED or Brooker's merocyanine. MOED's color changes depending on the solvent and its polarity. In general, the more polar the solvent, the shorter the wavelength of light it will absorb. This is referred to as a bathochromic shift. The solution will appear as the complementary color of the light it absorbs. This is because the molecule can exist in neutral and zwitterion resonance forms. We have synthesized MOED using an expedited route and tested its solvatochromic properties in various solvents. Our future goals are to synthesize novel solvatochromic compounds, similar in structure to that of MOED, and compare their properties.

Title: Numerical and Stability Analysis of the Lengyel-Epstein and Brusselator Systems
Author: Parker Evans
Affiliation: Southern Utah University
Abstract: We study a Lengyel-Epstein and Brusselator system, which are used to describe the reaction of chlorite-iodide-malonic acid (CIMA) and the BZ reactants. These reactions are commonly found in nature, describing certain patterns such as the recurring stripes in a zebras and leopards and other cyclic patterns. The stability of the steady-state solution of these systems are analyzed. We develop some numerical schemes that guarantee the positivity of solutions. The numerical solutions, from the numerical schemes we have developed, verify the theoretical results for the system.

SOCIAL SCIENCE ORAL

Title: "Ripple in Still Water": Psychedelic Rock Resistance
Author: Theresa A. Martinez
Affiliation: University of Utah

Abstract: Psychedelic rock music sprang from a fascinating amalgam of influences. The sound perhaps first emerges from a pioneer boomtown mentality of free-thinking and Barbary Coast-mindedness found in the San Francisco Bay Area. Wedded to this was a history of campus and community political activism—from trade unionist movements to student organizing at the University of California at Berkeley. In addition, the Beat Generation had a hand in the mix as some of its members settled in San Francisco in the 1950s for a time, sowing the seeds of countercultural dissent against the quintessential American status quo, privileged white work ethic in the throes of materialistic and conspicuous acquisition. Moreover, the music of this era would be itself guided by the folk rock of its day, but also a revival of interest in African American blues and jazz. Psychedelic rock referenced the interests and concerns of countercultural artists in the Bay Area and often focused on critiques of the establishment. This paper is an exploration of psychedelic rock through a theoretical framework that builds on dramaturgical approach as well as oppositional culture and resistance theories' performance as resistance or oppositional performance. Through a content and thematic analysis of the lyrics of selected psychedelic rock artists, we will reveal a wealth of oppositional performance.

Title: Toxic Friendship Scale
Authors: Emily Arrington, Maya Howell, Avery Hansen, JD Myers
Affiliation: Snow College
Abstract: Multiple assessments exist to evaluate different relationships. The Marital Satisfaction Inventory, developed by Douglas Snyder, assesses marital satisfaction and quality (Synyder, 1997). Another study created a friendship inventory to assess positive and negative friendship qualities in young adolescents (Ferguson et al., 2019). Many of us have friends with whom we spend much of our time. How do we know if the friends we make are influencing us in good ways? Are our friends toxic? Do females stay in unhealthy friendships more than males? We decided to conduct research to create a Toxic Friendship Scale and to assess which gender is more willing to stay in an unhealthy friendship. There are many scales to evaluate intimate relationships, however, there is a lack of serious scales to assess friendship quality. There is a lack of friendship assessments that determines the quality of a friend and how healthy the relationship is. Our assessment will focus on assessing these aspects of friendship, specifically for ages 25 and under. We chose this age range because at this time we are developing socially and have a dependence on our peers. The assessment will only assess interpersonal relationships and will assess if the friendship is emotionally and mentally damaging. There is a lack of information on unhealthy friendships, we are aiming to assess toxic relationships but also whether or not a male or a female is more likely to stay in a toxic friendship. We plan to create an assessment to evaluate unhealthy friendships in adolescents to young adults. We will do this by giving males and females a survey to find if they have unhealthy friendships. We will be assessing students at a small college in rural Utah. We aim to assess which gender has more toxic friendships with this assessment.

Title: The Influence of Pressure on Decision Making
Authors: Shayla Howe, Charly Pace, Ryker Erickson, Demi Contreras
Affiliation: Snow College
Abstract: The average adult makes a whopping 35,000 decisions per day, ranging from something as simple as deciding to brush your teeth to the complexities of planning a birthday party (Hoomans, 2015). Several factors influence how much time and thought is involved in decision making, and there are studies that research further into these factors (Dietrich, 2010). One variable that clearly has an impact yet has not been adequately researched is the impact of pressure on the ability and time it takes to make a decision. To gain insight on how the pressure of a situation inhibits or encourages the ability to make decisions, two tasks will be measured: planning a date and creating a school presentation. Four variables within each task will be tested: first as an individual with high pressure, second an individual with little pressure, third with a group facing high pressure, and fourth in a group completing a task with low pressure. This will be done through task simulation and observation combined with survey questions during and after the experiment. Questions will be administered in intervals throughout the task to gauge stress levels, derived from the State-Trait Anxiety Inventory. The pressure felt will be measured both by self-report in the survey as well as visual observation for signs of distress by the researchers during the experiment. This will be compared with the concluding choice that was made and the time it took for the group/individual to come to that conclusion. The anticipated outcome is that individuals who face high-pressure decisions will feel more stressed and take longer to make decisions. This study is beneficial in understanding how to address and potentially relieve unnecessary pressures.

Title: Can't Buy Me Friendship
Authors: Arielle Brooks, Rubie Hernandez, Zamera Male, Alexi Hernandez
Affiliation: Snow College
Abstract: Research shows how one's socioeconomic status with race or ethnic groups, to which they belong,

can have an effect on the way that they are perceived. But just how does socioeconomic status alone affect these perceptions and affect a friendship? The current research does not show exactly if one's socioeconomic status affects the way one perceives their friends' social status and how it affects their relationship. A major hole in the research is that there is scarce research specifically with socioeconomic status and the effects it may have on friendships. This may add new insight to the current research because it will solely focus on the socioeconomic status and its effects, rather than focusing on different variables such as race or ethnic background and educational background. With this research, it may help provide answers to other questions such as what condition a friendship is in, what conditions people need to become friends, and what other conditions people need to continue friendships. A method of getting the sample for the research will consist of sending out surveys to college students that consist of various questions, such as what is their net income, their parent's net income, what social class they are in, what social class they believe their friends are in, and how they perceive their relationships. This method would only focus on college students because of the way college students tend to be diverse and their relationship status and their socioeconomic class. The results may show how friendships are perceived based on socioeconomic status and whether it affects the relationship.

Title: Dismantling Speciesism through Ecofeminism
Author: Kiana Avlon
Affiliation: Westminster College
Abstract: "Speciesism," the belief that human animals are superior to non-human animals, results in the domination and violence of othered bodies and the environment. This belief system is underpinned by root causes including, but not limited to, anthropocentrism, patriarchy, and rationalism, which hierarchically arrange one type of identity or way of knowledge as superior to others. This presentation investigates these root causes to shed light on the historical context and the current implications in the animal liberation movement. Whether it is Francis Bacon's description of nature as the common harlot or Kant's ideal of rationality devoid of emotion and intuition, these ideologies continually shape the prevalent view that humans, specifically white, cishetero males of European origin/descent, have dominion. Furthermore, anthropocentrism, patriarchy, and rationalism inform dominant economic and political systems fueled by the commodification and assault of nature and bodies. Ecofeminism offers a powerful framework to counter the root cause of speciesism as this theory studies the overlap of the oppression of women and nature. Understanding the role of ecofeminists, who center their work on the inclusion of non-human animals, is crucial to unlearn hegemonic beliefs and to adopt alternative ways of co-existing with other beings within ecological systems at large.

Title: Climate Justice and the Human Rights of the Subaltern: A Dire Need for a Treaty
Author: Giancarlo Panagia
Affiliation: Westminster College
Abstract: This paper analyzes the human rights and lack of political recognition of residents within the Global South and those countries, specifically in the central Pacific Ocean, where the impacts of climate change are already being seen and felt. This research focuses on the application of theories and concepts of political recognition and status to the bio- and necro-politics of those doomed to live bare lives in those islands. Some authors already provide, as a solution, the drafting of a new treaty for the protection of climate refugees, given the inability of the international community to provide any form of rescue to these islands. We suggest the use of the tool of actor–network theory as a foundation for the drafting, signing, and ratification of this new treaty.

Title: Leadership: A Protean Institution of the Mind and of Civilization
Author: Pierce Bassett
Affiliation: Brigham Young University
Abstract: As the inherent nature of leadership is continuously redefined in contemporary society, there is accentuating emphasis placed on its utilization and comprehension. The primary objective of this research paper is to examine this emphasis on leaders in the 20th and 21st century, analyzed from the perspective of a university student. This research explores the study of specific styles, differences, and examples of leaders within community and throughout history. Further studies into the development of leadership processes based on have the potential for the synthesis of ultramodern techniques in the advancement of ethics, diversity, and communication in all facets of leadership positions.

Title: Has the World Failed Us? Social Sickness in Utah County
Author: Katherine Berrett
Affiliation: Brigham Young University
Abstract: There is a long tradition in anthropology of examining non-biomedical or "native" forms of healing. This paper contributes to this anthropological dialogue by critically assessing why people gravitate to more holistic practices. If anything, anthropology teaches us that a holistic view of what constitutes health and the

body is the norm rather than the exception. My research was conducted in Utah through ethnographic data collection. My methodology was participant observations, interviews, and focus groups. I present my data based on actual conversations and personal experiences I had with eight individuals who practice complementary and alternative medicine, specifically using gemstones and crystals. Recently, there has been a resurgence of the recognition individual trauma may play in the receptivity of more alternative forms of health care. While I think trauma provides a narrative structure, it cannot be the sole explanation of why people seek non-biomedical treatments. This paper will argue that the social practice of alternative healing through gemstones and crystals cannot be explained away as a coping mechanism for personal failure. My evidence will show this by introducing my readers to four of my key informants who have experienced trauma and participated in crystal healing as they sought meaning and purpose in their suffering. Finally, I will show an example of an informant that uses alternative medicine although he has not experienced traumatic life experiences. My results showed that people often feel alienated by their families, social groups, or medical doctors. My informants found comfort, health, and purpose in alternative health care practices. This study emphasizes the need to take into account the impact of social systems and the growing concern in the United States with impersonal and expensive health care systems.

Title: Understanding Us Programing
Authors: Daniel Poole, Kambry Woodbury, Corey Williams, Marina Folwer, Dan Baird
Affiliation: Salt Lake Community College
Abstract: Salt Lake Community College student researchers collaborated with Understanding Us, a local nonprofit organization, to collect demographic information among people experiencing homelessness in downtown Salt Lake City. This organization currently provides several programs, including a Tai Chi program at the downtown library. Student researchers have collected preliminary demographic survey data to help the organization better understand the population they are serving to best meet the needs of participants. This information will help to measure program efficacy, educate the broader community about homelessness, and help to provide data that can be used to further Understanding Us programing.

Title: Peeking through the Palisade at Palmares: A Composite Social History
Author: Austin Nelsen
Affiliation: Weber State University
Abstract: This paper analyzes the history of Palmares, a seventeenth-century maroon community located in the hinterlands of colonial Brazil with a population of between 10,000 and 20,000 escaped slaves, indigenous tribes, exiled Dutch colonists, and Portuguese deserters. Currently, very little is known about the inner workings of Palmares, including its social institutions or its political structures. Existing colonial sources portray the community as an inherent foe, but the relationship between colonists and Palmares was more nuanced and complex, involving mutual benefits. The complete lack of sources from within Palmares has forced historians to paint the community with broad brushstrokes, resulting in conflicting portraits of Palmares. This paper utilizes a three-pronged methodology to better understand Palmares and its society: a critical analysis of official colonial records dealing with Palmares, comparisons with other contemporary maroon communities, and an evaluation of the published archeological record from the area. The society uncovered by this approach refutes previous characterizations of Palmares, revealing a portrait of a complex, trans-Atlantic community.

Title: A Longitudinal Test of Law Enforcement Officer Training to Prevent Citizen Suicide
Authors: R.C. Morris, Philip J. Osteen
Affiliation: Weber State University, University of Utah
Abstract: Law enforcement officers (LEOs) frequently act as community gatekeepers, linking community members with resources such as mental health services. This is the result of LEOs acting in their role as first responders to calls for service. LEOs often arrive to a call before mental health professionals (Marzano et al., 2016; Matheson et al., 2005). For example, Cerel et al. (2018) found that 95% of LEOs surveyed had acted as a first responder to mental health crises involving suicide, with an average of 30.9 career responses to suicide. LEOs are increasingly the first line of service for people facing mental health challenges; and, based on government data sources, this trend seems likely to increase. This article examines LEO mental health training focused on suicide. We review the literature on training of LEOs to respond to mental health crises, with specific focus on suicide. We conduct a longitudinal test of effective LEO interaction with citizens during calls for service (see also Arensman et al., 2016). Our main dependent variable of interest is LEOs use of questions about suicide. Additionally, controls for LEO attitudes about mental illness, self-efficacy beliefs, as well as knowledge related to mental health issues and suicide were specifically included in our analysis. Findings suggest several important factors useful to guide police departments as they seek to better serve citizens during LEO interactions involving suicide. For instance, based on our longitudinal design, we find that on-the-job

training increases LEO effectiveness while off-the-job training has no statistically significant impact on LEO use of questions aimed at awareness and prevention of suicide. Additional results shaping LEO effectiveness as well as limitations will be presented.

Title: Article 9: Japan's Constitutional Conundrum
Author: Sasha Woffinden
Affiliation: Brigham Young University
Abstract: Pursuant to Japan's defeat in World War II, the United States rewrote Japan's Constitution, modifying Japan's style of governance and imposing restrictions on the country's military capabilities. Article 9 (known colloquially as the "peace" or "pacifist" clause), one of the clauses promulgated in Japan's post-war Constitution, exemplifies the U.S. mission at the time: destroying any chance of Japan resurging to power by forcing the country to demilitarize and relinquish its military capabilities. It also prohibits Japan from ever maintaining a standing army again. Thereafter, the U.S. and Japan ratified the Treaty of Mutual Security, which obligates the U.S. to commit a portion of its troops and weapons to defending a demilitarized and defenseless Japan. This arrangement still holds today. While Article 9 and the U.S.–Japan treaty were arguably conducive to Japan's post-war recuperation and economic revitalization, as well as symbolically significant to many Japanese of their country's eternal commitment to peace, the modern political climate has diminished their ability to adequately protect Japan's security. This paper explores two questions, the first of which asks whether Article 9 should be revised. Given rising tensions with China and North Korea, wavering U.S. commitment, the evolving nature of U.S.–Japan relations, and doubts about the constitutionality of Japan's important Self Defense Forces, this paper concludes that Article 9 must be revised to reflect Japan's contemporary realities and the challenges it faces. The second question asks what risks, if any, that a revision of Article 9 would incur. This paper proposes two considerations towards this end: Revision may result in domestic unrest and a deterioration of relations with neighboring and enemy states. Despite these proposed perils, this paper ultimately concludes that such risks are mitigated by the necessity of revising Japan's Constitution to protect national security, the integrity of the Constitution, and Japan's independence.

Title: Blue-Collar Workers' Perceptions of Queer Individuals
Author: Cameron Arnold
Affiliation: Southern Utah University
Abstract: The perceptions of blue-collar workers is an under-looked part of understanding queer identities in the social world. Those perceptions influence people's views, views influence voting and legislation. This study used a survey to measure various comfort levels for interacting with queer individuals. The hypotheses predict that more people are comfortable with homosexuality than gender identity, that they are more comfortable working with queer people rather than being friends, and that there will be a lack of support for queer legislation.

Title: Housing and Autism Spectrum Disorder: Insights from Individuals and Families
Authors: Jonathan Westover, Maren Paulsen, Kari Bushman, Teresa Cardon
Affiliation: Utah Valley University
Abstract: Background: Autism is one of the fastest growing disabilities in the country. Housing for autistic adults remains elusive for many, and access to funding and supports is often nonexistent. The aim of this project was to better understand the current and future housing needs of autistic adults in Utah from the perspective of autistic individuals and their caregivers. Methods: Two surveys, one provided to autistic individuals and one to parents/guardians of autistic individuals, were developed and disseminated among a sample of convenience using social media and email. Descriptive analysis of the survey responses was undertaken for all respondents. Results: The majority of respondents still live with their parents, and housing options are limited. The majority of autistic respondents stated that employment was funding their housing needs, and the majority of parents/guardians indicated that family funding was the primary source. The majority of autistic adults wanted to live independently. A clear dichotomy was present between parent/guardian responses and autistic adult responses. Conclusions: The data received from the survey provide evidence that appropriate housing options for autistic individuals in Utah have been and continue to be an ongoing struggle. There are many individual organizations trying to offer solutions, but working together to synthesize research, outcomes, and lessons learned is imperative to finding optimal housing support for adults on the autism spectrum.

Title: The Use of Digital Folklore to Reduce Internalized Stigma Related to Civilian PTSD
Author: Geneva Harline
Affiliation: Salt Lake Community College
Abstract: For over twenty years, folklore has been used in conjunction with traditional health care assessment

methods as a way to assess community health care misinformation, which may not be captured through traditional medical research. The folklorist's approach to gathering and analyzing vernacular communication allows for the discovery of misconceptions on the part of the community that may have potentially detrimental effects on the health of people who suffer from, or risk transmitting, illnesses. Until recently, the majority of this research has been done on issues such as the AIDS virus or the anti-vaccination movement. This study builds on those concepts, using digital folklore (specifically memes on Facebook) to explore the ways that civilians with PTSD are resisting internalized stigma by reaching out to their friends and family members through social media. To examine how the stigma of PTSD is portrayed in digital environments, I will be following the guidelines of a "folkloric approach to stigma" recommended by Amy Shuman in her 2012 article, "The Stigmatized Vernacular." In summary, these guidelines as they relate to my research are: 1) to determine what is considered normal; 2) to observe of the facets of stigma; 3) to analyze both digital folklore and comments to identify how stigma is enacted by people inside and outside the PTSD community; 4) to explore cultural expectations of narrative norms; and 5) to determine how stigmatized groups position themselves with regard to normal (Shuman, 2012:202). After gathering data in a random distribution from public Facebook groups over a six-month period and then applying a close rhetorical analysis of both the images and the words chosen to portray PTSD, I have determined several ways in which digital folklore is being used to resist the internalized stigma of PTSD using an adaptation of William Benoit's image repair theory applied to self-image.

Title: Utah's High Suicide Rate: What College Students Say about the Causes
Author: Huiying Hill
Affiliation: Weber State University
Abstract: Per the requirement of Weber State University that all the general education courses need to assign a Signature Assignment (SA) relevant to the course subject to each student, in my Introduction to Sociology class, my SA topic is to use sociological concepts and theories to explain why Utah is ranked very high in teen suicide and suicide in general and why suicide rate is on the rise in the United States. Each student was assigned to answer 5 to 6 questions in their portfolio essays throughout the semester. By the end of the semester, they need to combine all their portfolio entries and finish a final paper, the SA. This paper is a summary of what my students have written in their SA in the fall semester, 2019. Each student signed a consent form that their papers can be cited for public purposes. The categories in the summary include using Durkheim's suicide theory, cultural and religious values, labeling theory, bureaucracy, economic poverty, and gender role to examine the causes of suicide and it is a multifaceted issue. Curbing suicide rate is not a singular matter, and it needs more complex methods to deal with this social phenomenon.

ALL U NEED

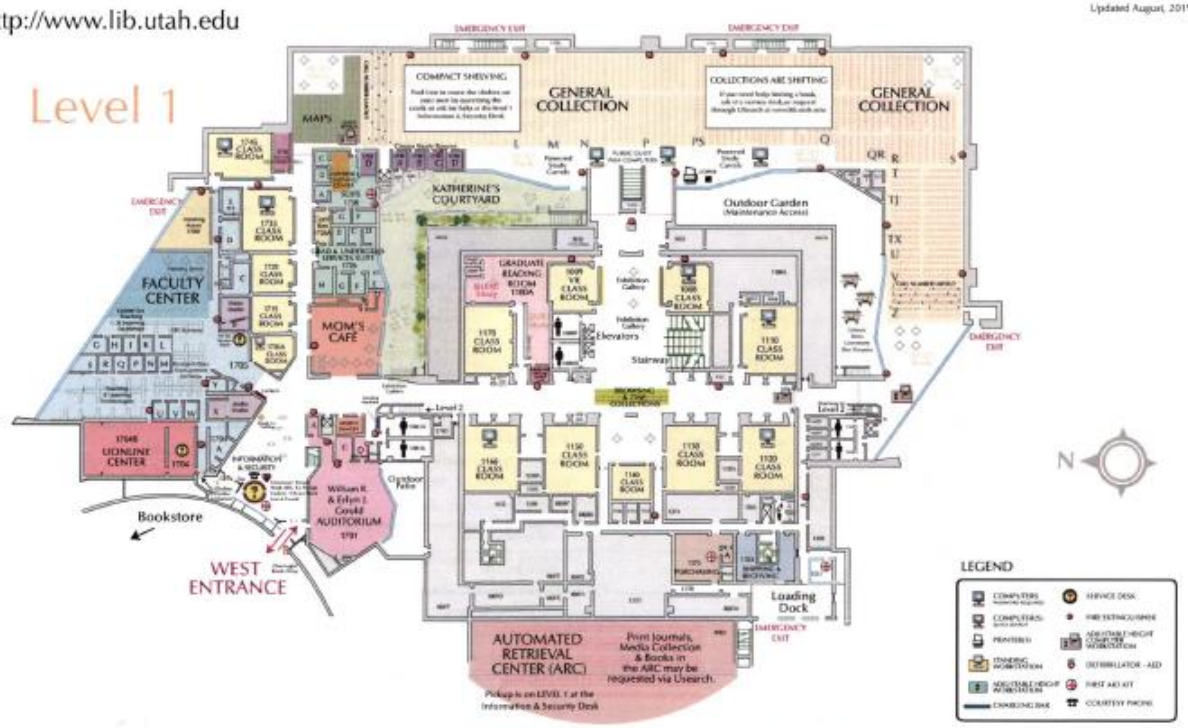
J. Willard Marriott Library
THE UNIVERSITY OF UTAH

Floor Maps

http://www.lib.utah.edu

Updated August, 2019

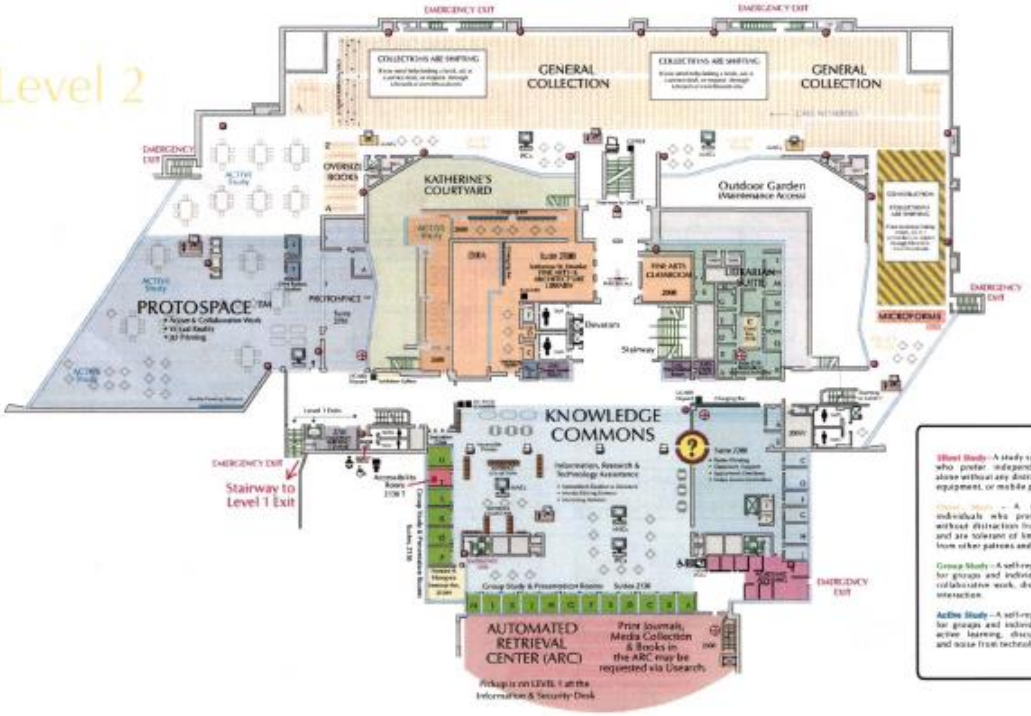
Level 1



LEGEND

COMPUTERS
COMPUTERS
PRINTERS
STANDING WORKSTATION
ADJUSTABLE HEIGHT WORKSTATION
SERVICE DESK
FIRE EXTINGUISHER
ADJUSTABLE HEIGHT COMPUTER WORKSTATION
DEFIBRILLATOR - AED
FIRST AID KIT
COURTESY PHONE

Level 2



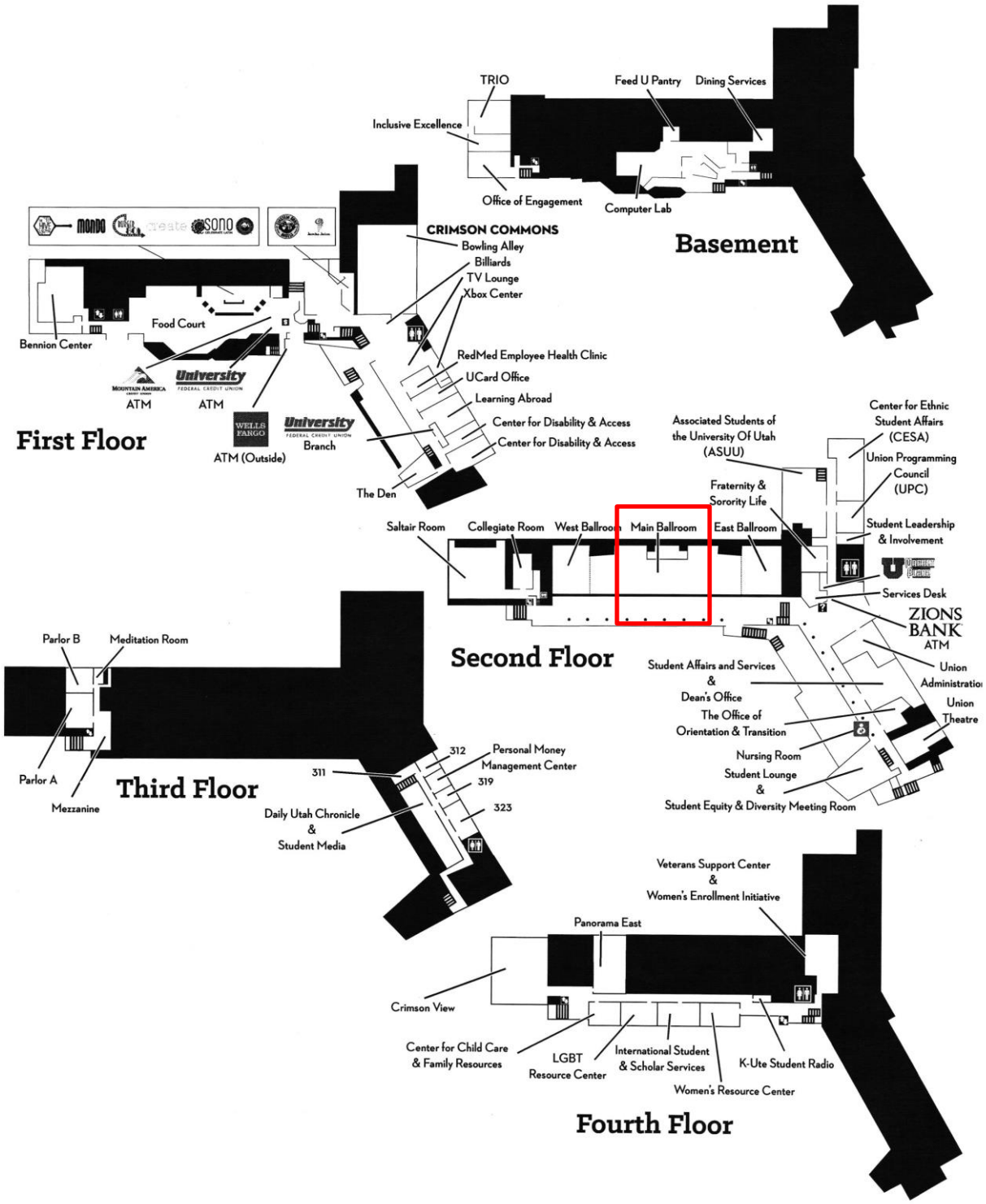
Silent Study – A study space for individuals who prefer independence of studying alone without any distraction from talking, equipment, or mobile phones.

Quiet Study – A study space for individuals who prefer independence without distraction from mobile phones and are tolerant of limited interruptions from other patrons and library activities.

Group Study – A self-regulated study space for groups and individuals that supports collaborative work, discussion, and lively interaction.

Active Study – A self-regulated study space for groups and individuals that supports active learning, discussion, interaction, and noise from technology and equipment.

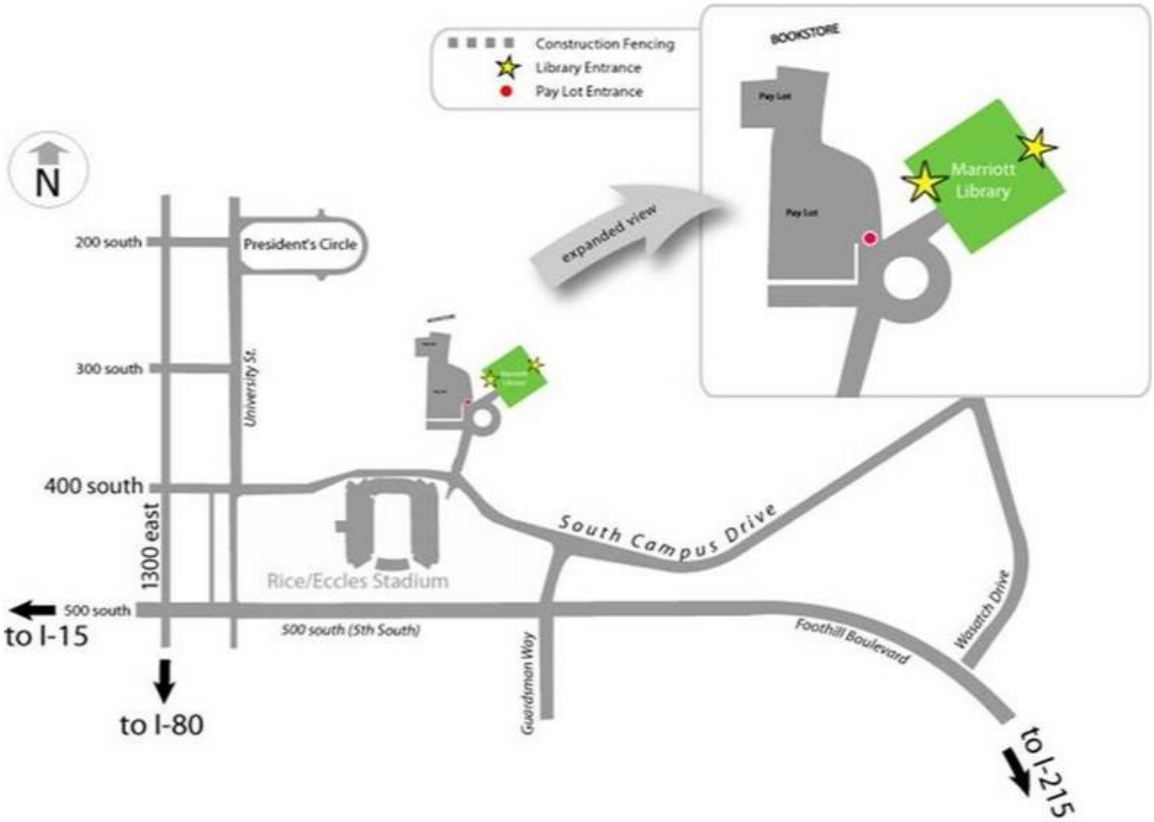
A. Ray Olpin Union Building Map



University of Utah Campus Map
Marriott Library
295 S 1500 E
Salt Lake City, UT

<u>Parking Enforced Monday – Friday from 7:00 a.m. to 10:00 p.m.</u>
Park in the pay parking lot west of the Marriott Library Lot 6

- License Plate Number
- Pay at the Kiosk and follow the prompts $2.00 per hour rate $20.00 Daily Maximum
- Cross at the cross walk to enter into the Marriott Library West Entrence
- East of the Rice Eccles Stadium
- License Plate Number
- Call for permit 801-581-6415 $10.00 a day rate
- https://commuterservices.utah.edu/parking/#maps


Construction Fencing
Library Entrance
Pay Lot Entrance
BOOKSTORE
Pay Lot
Pay Lot
Marriott Library
expanded view
N
200 south
President's Circle
300 south
University St.
400 south
1300 east
Rice/Eccles Stadium
South Campus Drive
500 south
to I-15
500 south (5th South)
Guardsman Way
Foothill Boulevard
Wasatch Drive
to I-80
to I-215


Science
Marriott Library
Law
Rice-Eccles Stadium