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Research Day 2013

Abstract Listing

*University of Northern Colorado's
Annual Research Conference during
Academic Excellence Week*

April 11, 2013
University Center

**Sponsored and facilitated by
Office of Undergraduate Research
Center for Honors, Scholars & Leadership
Graduate Student Association
The Graduate School**



2013 UNC Research Day

Abstract Listing

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Oral Presentations

Anthropology

Living in the Moment: Symbolic Immortality-Themed Media influences on College Students Social Drinking Culture

Presenter(s): Brothe, Mariah

Faculty Sponsor(s): McBeth, Sally

Undergraduate Presentation

03:40 - 03:55 in the Afternoon - Room: Aspen B

My project examines the conceptual connections between symbolic immortality-themed media and some college students' behaviors in social drinking culture. Robert Lifton's theory of symbolic immortality informs my research as a possible explanation for the reasons that some United States college students engage with immortality-themed media and participate in social drinking culture. Lifton's theory suggests that humans overcome their fear of death through transcendental experiences that connect to neither the past nor the future; hence, humans are living in the moment (cited in Bryant, 2009). Based on Lifton's theory, I investigate the media influence through a combination of two research components. The first component analyzes examples from vampire-themed media such as *Twilight*, *Vampire Diaries*, and *True Blood*. The second component consists of interview questions to be asked of participants about their engagement with immortality-themed media. The media is found to have several connections to symbolic immortality themes. There are also several themes of symbolic immortality with social drinking culture as revealed in the anecdotes provided by the participants. There are some correlations between media and social drinking culture. Further research will need to be conducted to solidify the existence of a true connection between the media and social drinking culture. Overall, my research provides a unique anthropological perspective to Lifton's theory and offers some insight regarding certain college students' behavior in a social drinking situation and to the new direction in which media is partaking.

Totem Teddy: A Student Intern's Point of View

Presenter(s): Wright, Wendy

Faculty Sponsor(s): McBeth, Sally

Undergraduate Presentation

02:40 - 02:55 in the Afternoon - Room: Columbine B

This anthropological approach to recording and presenting the history of an 88-year-long stay of a Tlingit totem pole on the UNC campus will highlight the importance of applied anthropology and personal experience in an academic community. I will begin with a brief history of the Tlingit Indians of Angoon, Alaska followed by a more detailed history of the totem pole affectionately named "Totem Teddy" by the UNC community. Then I will provide an explanation of the Native American Graves Protection and Repatriation Act (NAGPRA) and recount the repatriation of "Totem Teddy" to the Bear Clan of the Tlingit Tribe. This story is incredibly important to the University of Northern Colorado not only because it showcases the honesty and will to set things right on the part of UNC during the repatriation, but because the totem pole is the reason that the UNC mascot is the bears. My methodology consists of archival research in the University of Northern Colorado Archives as well as interviews with several people involved in the Repatriation. The anticipated conclusion of this research is the importance of cross-cultural understanding on a University Campus using the story of Totem Teddy as a case study that is both relevant and important to the members of the campus community. Further research could include a first hand account of the Totem Pole's current location in Angoon, Alaska as well as interviews with members of the Tlingit tribe.

Applied Statistics & Research Methods

A Generalized Method Approach for Spatial-Temporal Binary Data

Presenter(s): Kaufeld, Kimberly

Faculty Sponsor(s): Lalonde, Trent

Graduate Presentation

02:40 - 02:55 in the Afternoon - Room: Aspen C

Binary data that are correlated across space and time often occur in health and ecological studies. The centered spatial-temporal autologistic regression model (Wang & Zheng, 2012) accounts for the spatial and temporal dependence that can occur in binary data. Statistical inference for the autologistic model has been based upon pseudolikelihood, Monte Carlo Maximum Likelihood (MCML) or Bayesian hierarchical models. However, these methods require the full conditional distribution to be defined and with

the complexity of spatial and temporal dependence and interactions between observations can cause convergence issues as well as an increase in computation time. In this research, we develop an alternative approach using generalized method of moments. In this method the full distribution does not need to be specified, but rather can be specified by the first two moments. A set of estimating equations with a specified working correlation structure is constructed to deal with the spatial and temporal dependence of the data.

Education Innovation Institute: "Region and Tuition and Fees at Public Universities: An Examination of the Impacts of Census Division Effects?"

Presenter(s): Cohen, Joshua; Serna, Ganriel R.

Faculty Sponsor(s): Lalonde, Trent

Graduate Presentation

02:00 - 02:15 in the Afternoon - Room: Aspen A

Multiple Session Presentation - Sessions 11, 12, 13, 14

Recent research on state expenditure on public higher education has suggested that support to this sector may be influenced by region. In other words, it may be the case that differences in state support are a partial result of historical equilibria that have developed across these U.S. by geographic region. In this study we seek to estimate the impacts of census division on state expenditures to public higher education while controlling for a number of other relevant state characteristics. By employing a relatively new econometric technique, Fixed-Effects Vector Decomposition, we can now estimate and compare these relationships over a 13 year period. Because this technique provides a mechanism for estimating slow-changing or time-invariant regressors correlated with unit effects, it is now possible to efficiently and consistently estimate these parameter coefficients which in this case are census divisions. We are confident that this research will provide an understanding of the impact of region on funding patterns to this sector and thus expand the literature on state support for public institutions of higher education.

Education Innovation Institute: A Mixed Methods Study on the Impact of Concurrent Enrollment Participation on Student's College Choice Process and College Readiness

Presenter(s): Fanselow, Stephanie A.; Nash, Chad

Faculty Sponsor(s): Lalonde, Trent

Graduate Presentation

01:20 - 01:35 in the Afternoon - Room: Aspen A

Multiple Session Presentation - Sessions 11, 12, 13, 14

This current study presents preliminary findings from research examining the impact of high school concurrent enrollment programs on the college level outcomes of marginalized student groups within the state of Colorado, as well as the implications of such programs on the equity and equality of educational opportunities for all student groups. Concurrent enrollment programs allow students an opportunity to engage in actual college classes while still in high school, with the hopes of increasing college readiness and college graduation levels. However, while there has been a burgeoning literature descriptively stating the positive nature of such programs, more rigorously empirical studies need to be conducted to understand the effect of concurrent enrollment programs on student's college level outcomes. Using an explanatory sequential mixed methods design, this study was undertaken in two phases, using both quantitative and qualitative research techniques. In the first stage, large-scale quantitative data from the Colorado Department of Higher Education is used to assess whether student participation in concurrent enrollment impacts: 1) what types of institutions students attend for postsecondary education, 2) whether students will need academic remediation during their first year of postsecondary schooling, and 3) student's first year cumulative GPA. The second, qualitative phase will be conducted as a follow-up to the large scale quantitative analysis to help explain the quantitative results. In the qualitative follow-up, I explore the 'how' and 'why' concurrent enrollment affects student's "habitus" during the college decision making process and their feelings of "self-efficacy" as it relates to their college readiness. The qualitative portion of the study includes in-depth interviews with students who are currently participating in concurrent enrollment within a Colorado school district represented in the CDHE quantitative data.

Education Innovation Institute: Linguistically Diverse Education Program Development Preliminary Findings

Presenter(s): Siegrist, Mary; Damsri, Chanaichon

Faculty Sponsor(s): Lalonde, Trent

Graduate Presentation

01:00 - 01:15 in the Afternoon - Room: Aspen A

Multiple Session Presentation - Sessions 11, 12, 13, 14

The need for qualified educators trained to work with English language learners (ELL) continues to increase in Colorado. Through an Improving Teacher Quality (ITQ) Grant from the State of Colorado, UNC developed and implemented a professional development program for in-service teachers in the area of Linguistically Diverse Education (LDE) with a special education component for ELL students. The program included 12 credit hours of coursework that prepared participants to qualify for the ELA Specialist Certificate. Preliminary analysis of the project demonstrated a statistically significant growth in participants'

ability to pinpoint salient linguistic features embedded in their respective course content, and participants' ability to design, adapt, and implement formative assessments that measure student growth in both subject-area content and the use of content-specific language. In addition, the lessons learned by the graduate assistants who worked on this project regarding effective ways to set up a grant funded project will be shared in this presentation.

Education Innovation Institute: Outcomes of Remediation at University of Northern Colorado

Presenter(s): Robinson, Rachel; Fanselow, Stephanie A.

Faculty Sponsor(s): Lalonde, Trent

Graduate Presentation

01:40 - 01:55 in the Afternoon - Room: Aspen A

Multiple Session Presentation - Sessions 11, 12, 13, 14

The purpose of this study was to compare the outcomes of University of Northern Colorado students who were automatically assigned to remedial courses upon entering the university due to low SAT/ACT scores to UNC students who were not assigned to remediation. The state of Colorado mandates that students entering college who have SAT/ACT scores below a certain cut off point be placed in remedial courses in mathematics, reading, or writing, based on subject area scores. Administrative data maintained by UNC for all freshmen entering UNC from 2007 through 2012 was descriptively analyzed to compare outcomes for students assigned to remediation and for those students who were not. Enrollment and completion of remedial courses, completion of gateway courses, persistence to the second year, and completion of a degree were determined for both groups. Results of this research will provide greater insight for those working with this population, as well as contribute to the statewide dialogue regarding the appropriateness of cut off scores and remediation requirements.

Effects of Ignoring Truncation in Poisson Count Models

Presenter(s): Suaiee, Abdalhalim

Faculty Sponsor(s): Lalonde, Trent

Graduate Presentation

01:00 - 01:15 in the Afternoon - Room: Spruce A

Count data are often modeled using a Poisson GLM (Cameron & Trivedi, 1999). It is common in practice to see situations in which counts are restricted to a specific interval. Examples of truncated data arise in many contexts. The number of accidents per worker in a factory and the number of visits to a hospital can be examples of zero truncated data. The case of zero-truncated count data has been studied extensively (Winkelmann, 2008), as have general left-truncated count models (Cameron & Trivedi, 1999). The right-truncated model is less common, but has been described (Cameron & Trivedi, 1999). Double-truncated count models have received little attention (Cohen, 1954).

This paper presents the Poisson count model (PGLM), the left-truncated PGLM, the right-truncated PGLM, and the double-truncated PGLM in a single framework. The bias associated with failing to model each type of truncation is presented. Simulation studies are performed to compare the relative effects of failing to acknowledge types of truncation on parameter estimate bias and standard error, as well as power and Type I error rate for standard Wald tests. Recommendations for model selection are made.

The Longitudinal study of the IEP's (Intensive English Program) effect on the international students' future academic Achievement

Presenter(s): Ramezani, Niloofar

Faculty Sponsor(s): Lalonde, Trent

Graduate Presentation

11:00 - 11:15 in the Morning - Room: Aspen B

Intensive English Program for the international students who do not meet English proficiency requirements is a worldwide program running in most international schools and so at UNC to support students learning English as a second language; therefore, it is important to study its effect on the short and long term academic achievement of international students. A longitudinal study on students who started their studies at UNC through IEP program at CIE and then continued their studies as undergraduate or graduate international students at different academic departments was done. This study contains separate models for two academic years of starting the program (2009-2010 and 2010-2011). For each year, a longitudinal study is done on the same cohort of students over the entire IEP program and then 4 continuous academic semesters.

To control the research atmosphere and reduce the uncontrollable or nuisance factors, like the effect of human subjects, students' information for the same group of students is considered over years by keeping them in the same group. This gives us the opportunity to consider the growth model of students who started their IEP program at the same time with the same instructors, coordinator, and staff members. This is why different years were analyzed separately to keep the research situation under control for each cohort. Considering the parametric and non-parametric methods to test the correlations show the high correlation of IEP GPA with other semesters specially the fourth semester.

Fitting the regression model led us to have the highest regression coefficient for the IEP GPA on the long term academic achievement of international students.

The Hierarchical Multiple Regression modeling (aka Incremental Partitioning of Variance) is used based on having a solid theoretical basis for determining the order of demographic and explanatory variables being entered into the regression model.

Asian Studies

Gender Roles of Japanese Women in Anime

Presenter(s): Herreria Gomez, Lily

Faculty Sponsor(s): Low, Michelle

Undergraduate Presentation

01:40 - 01:55 in the Afternoon - Room: Columbine B

In this paper I discuss the gender roles of women in Japanese various media, specifically in Sailor Moon. In this study I analyze and review how Japanese culture and values influence and define Japanese social norms through media.

Genji Then and Now

Presenter(s): Grigsby, Kaitlyn

Faculty Sponsor(s): Low, Michelle

Undergraduate Presentation

02:20 - 02:35 in the Afternoon - Room: Columbine B

Murasaki Shikibu's classic novel *The Tale of Genji* has been retold throughout the ages through various media such as woodblock prints, painted scrolls, and theater. Contemporary retellings have not been limited to visual and performance art. In the 1980's, Enchi Fumiko translated *Genji* into modern Japanese making it accessible to a modern audience. In many of these retellings, elements of *The Tale of Genji* have been transformed. By analyzing Enchi's version *Genji*, I examine how *Genji* has been transformed, specifically I compare the ways *Genji*'s and Murasaki's deaths are dealt with in the original Heian era story versus Enchi Fumiko's contemporary version, and discussing the culture of death in modern versus Heian Japan.

Getting the most out of JET

Presenter(s): Lovin, Marjorie

Faculty Sponsor(s): Low, Michelle

Undergraduate Presentation

02:00 - 02:15 in the Afternoon - Room: Columbine B

This study examines experiences of English teachers participating in the Japan Exchange and Teaching Programme (JET) and looks at the factors that contribute to successful or unsuccessful experiences. I look at how pre-departure expectations, assignment, knowledge and prior teaching experience influence the participant experience. I also examine some of the common pitfalls teachers have endured, and look at some of the strategies that have helped foreign English teachers get the most out of their experiences in JET.

Audiology & Speech-Language Sciences

Describing the Self-Efficacy Found in Parents of Children with Hearing Loss

Presenter(s): Walter, Jamie

Faculty Sponsor(s): Hanks, Julie

Research Excellence Award Finalist

Undergraduate Presentation

11:20 - 11:35 in the Morning - Room: Council Room

This study allowed an opportunity for parents of children with hearing loss who were being seen at the University of Northern Colorado Speech-Language Pathology/Audiology Clinic to provide information regarding personal measurements of self-efficacy and involvement concerning their child's life with a hearing loss. Research in this specific field has been spearheaded by Jean L. Desjardin, designer of the Scale of Parental Involvement and Self-Efficacy (SPISE). Due to the emergence of the SPISE in the area of parental self-efficacy, the primary purpose of this study was to compare the data obtained by parents whose children attend the UNC clinic to existing measures found in other populations.

Five parents of children with hearing loss were voluntarily recruited and were asked to complete a modified version of the Scale of Parental Involvement and Maternal Self-Efficacy (SPISE). The questionnaire contained three sections: demographic information, self-efficacy and parental involvement.

Given a sample of children who were identified with a hearing loss and provided amplification at a young age, overall parental self-efficacy and involvement was high, when compared to previous studies. With regard to involvement, responses indicated an overall level of confidence and dedication on behalf of the participating parents. Similar results were found with the parental self-efficacy questions and responses in this area concluded that the participants felt comfortable, knowledgeable and confident in their role as the parent to a child with a hearing loss. This research highlighted that the age of identification and amplification of a child provides a direct correlation to high parental self-efficacy and involvement. Additionally, mean scores were calculated for each item on the SPISE and compared to data previously published by Desjardin. The correlations drawn between the data and further results will be discussed in the oral presentation as well as implications for practitioners.

Effectiveness of the Dangerous Decibels® Hearing Loss Prevention Program When Delivered With Parental Involvement

Presenter(s): Clark, Amanda

Faculty Sponsor(s): Meinke, Deanna

Graduate Presentation

11:20 - 11:35 in the Morning - Room: Aspen C

Hearing loss prevention programs targeting children have been implemented in an effort to prevent noise-induced hearing loss and tinnitus in this age group. The purpose of this study was to investigate the effectiveness of parental involvement in the Dangerous Decibels® hearing loss prevention program taught to children as well as the parents in the study group. Through the use of pre, post and follow-up questionnaires, the effectiveness of the Dangerous Decibels program for children with parental involvement was compared to the effectiveness of the Dangerous Decibels program for children without parental involvement in the training session.

A total of 23 child/parent pairs were included in the control group and 22 child/parent pairs in the experimental group. Child participants were eight to twelve years of age. For this study, a baseline, post, and three-month follow-up questionnaire was utilized to assess the knowledge, attitudes, and intended behaviors of children and parents regarding NIHL and the prevention of NIHL.

Improvements in the knowledge, attitudes, and intended behaviors were evident at post and three-month follow-up for those participants who received the Dangerous Decibels program. There were significant differences in the knowledge, attitudes, and intended behaviors of children and their parents who attended the Dangerous Decibels program simultaneously, compared to those children and their parents that did not participate together. The Dangerous Decibels program can be successfully delivered simultaneously to both children and adults.

Integrating Hearing Status and Hearing Protector Attenuation to Estimate a Protected Articulation Index

Presenter(s): Huerta, Ashley

Faculty Sponsor(s): Meinke, Deanna

Graduate Presentation

09:00 - 09:15 in the Morning - Room: Columbine B

Despite efforts meant to protect workers from developing hearing loss from exposure to hazardous noise in the workplace, lack of consistent and appropriate use of HPDs is common. Workers have cited interference with communication with co-workers and reduced audibility of warning signals and/or equipment noise as leading reasons for poor compliance with HPD use. The present study examined the reduction in speech audibility caused by placement of HPDs using the E-A-RFit™ Validation System from 3M and the Count-the-Dots audiogram by Killion and Mueller (2010).

Hearing thresholds and measured HPD attenuation values were combined to represent “protected” thresholds. When plotted on the Count-the-Dots audiogram, unprotected and “protected” thresholds were used to estimate articulation indexes for normal hearing and hearing-impaired subjects in an attempt to quantify the reduction in speech audibility caused by placement of a commonly used HPD, the Classic™ slow-recovery foam earplug. Results revealed severely reduced speech audibility for both normal and hearing-impaired subjects fit with the Classic™ earplug. The findings support the use of alternative HPDs (e.g. active or flat-attenuation) in an effort to maintain audibility while still protecting workers from the effects of hazardous noise.

PARENT-CHILD SHARED BOOK READING: An exploration of story book reading as an influence in increasing the phonological awareness skills in preschool age children with both normal language development and language disorders.

Presenter(s): Rea, Amber

Faculty Sponsor(s): Fahey, Kathleen

Research Excellence Award Finalist

Undergraduate Presentation

09:20 - 09:35 in the Morning - Room: Council Room

As children learn their native language, they develop awareness of the structure of words, such as beginning and ending sounds, the number of syllables, and how some words sound similar to others. These skills are known collectively as phonological awareness. A gradual progression of abilities occurs during the preschool years as children are exposed to books, rhymes, songs, and daily interactions. Phonological awareness is an imperative foundation for increased language and literacy development. Parent-child shared story-book reading is one activity that may promote the development of phonological awareness in preschool-age children. In this thesis, I developed a series of single subject case studies guided by two research questions: Does shared story-book reading increase phonological awareness in preschool age children? Does shared story-book reading result in positive outcomes for children who are developing language normally and for children who have phonological delays? For this study, I collected quantitative data from two preschool-age children with normally developing language skills and two preschool-age children with phonological delays using The Test of Phonological Awareness (TOPA), which consists of twenty items that compare initial sounds in words. I then staged an intervention where each participant’s caregiver read a story book high in rhyming and alliteration with their child four times a week for four to five weeks. Additionally, each caregiver was supplied with a list of reading strategies to employ in fostering phonological awareness during each shared story-book reading session. To post-measure, I performed the same TOPA test I utilized four weeks prior and made note of and analyzed the differences between the two scores. The results of all four post-tests showed an increase in phonological awareness in all subjects, regardless of whether the child had phonological delays or not, highlighting the positive impact that shared story-book reading has on this essential metalinguistic skill.

Pitch perception in musicians and non-musicians: A comparison of psychophysical tuning curves and frequency difference limens

Presenter(s): Powner, Amber

Faculty Sponsor(s): Bright, Kathryn

Graduate Presentation

03:00 - 03:35 in the Afternoon - Room: Aspen C

Multiple Session Presentation - Sessions 17, 18

A group of classically trained musicians and a group of non-musicians were compared using psychophysical tasks of pitch perception to determine plasticity of the auditory mechanism as a result of musical training. Two measurements, frequency difference limens (DLFs) and psychophysical tuning curves (PTCs) were gathered on each subject at four frequencies in each ear. Results indicated a significant difference between musicians and non-musicians at two frequencies for DLF measures, and no other significant findings regarding PTC measurements. These findings reveal a significant musical training effect on DLF outcomes, while the effect of musical training on PTCs, if any, remains to be determined.

Biological Sciences

Autecology and synecology of the shortgrass steppe

Presenter(s): Brandt, Amber

Faculty Sponsor(s): Franklin, Scott

Graduate Presentation

08:30 - 08:40 in the Morning - Room: Longs Peak

Species respond individualistically to environmental and geographic gradients, biotic interactions, and disturbances. However, plant species are often located in assemblages along environmental gradients based on their life history characteristics. Thus,

vegetation communities may be classified and such classification allows managers to parameterize community characteristics, document their locations, and monitor changes. To date, no classification has been attempted for the Pawnee National Grasslands, so this base-line knowledge is lacking. Gaining an understanding of the complex nature of the shortgrass steppe will enable land management practices to accurately assess impacts from disturbances. From the baseline classification, scientists can monitor movement along the gradient that is expected as precipitation patterns and mean temperatures change. Species response to disturbances such as oil drilling and climate change can be examined at the individual, community and functional group levels. Through a convergence of autecology and synecology, an approximate prediction of community response can be modeled. Vegetation sampling will use guidelines presented in the United States National Vegetation Classification Standard at the association and alliance levels (Franklin, S. et al., 2012). Data collection will follow the Carolina Vegetation Survey outlined by Peet et al. (1998). Comprehensive analysis community structure using an ordination and species indicator analysis will render a classification that will then be compared to the US NVC. Community relationships with environmental variables will then be explored, modeled, and mapped in GIS. Benefits from this research include improving the USNVC, increasing the number of 'public' plots, and a mapped model of Pawnee National Grassland communities.

What The Philosophy Of Karl Popper Has To Do With Volunteer-Collected Data

Presenter(s): Brown, Lowrey

Faculty Sponsor(s): Franklin, Scott

Graduate Presentation

08:40 - 08:55 in the Morning - Room: Longs Peak

The Corporation for National and Community Service, a federal agency, estimates that Americans volunteered approximately 7.9 billion hours in formal organizations in 2012. The research arm of Independent Sector, a non-profit and nonpartisan coalition, estimated total American volunteer hours for a 12-month period from 2000 to 2001 (prior to September) to be around 15.5 billion hours. Scientific endeavors are no stranger to the potential of this massive labor force, now captured under the umbrella term "citizen science," and researchers point to the temporal, spatial, and financial advantages of citizen science networks, which can cover larger areas over longer periods than a more budget-constrained project using only paid, or professional, data collectors. However, despite a history of volunteer data collection in this country dating back to at least the 1880s when lighthouse keepers were enlisted to keep track of bird strikes, the use of data collected by volunteers continues to be viewed with considerable skepticism. Though there is a long tradition of citizen science in this country, research to assess volunteer data quality and to examine what factors influence the quality of volunteer-collected data is comparatively nascent. Over the last two decades, however, the body of work examining citizen science has grown considerably. With it, a picture of the strengths and weaknesses of volunteer data-collection, and a foundation for understanding best practices for citizen science, have begun to emerge. Such research is critical for two reasons. First, without documentation of volunteer data quality, vast bodies of volunteer-collected data have been overlooked and underutilized. Second, with shrinking budgets and growing competition for research dollars, the optimization of citizen science practices could vastly expand the tools available to researchers for formulating, asking, and answering research questions.

Rock wren song structure along a latitudinal gradient and across a migratory divide

Presenter(s): Najar, Nadjé

Faculty Sponsor(s): Benedict, Lauryn

Graduate Presentation

08:55 - 09:05 in the Morning - Room: Longs Peak

Bird song is an evolutionarily labile trait sensitive to many pressures. Migratory birds face enormous challenges: will this have an effect on their song? Rock wrens are widely distributed songbirds with a highly variable but simple song. Rock wrens occurring north of central Colorado are migratory, flying south to New Mexico and Mexico in the winter months, while more southern populations of rock wrens are sedentary and remain on their breeding territories year-round. I will be making audio recordings of rock wrens in the states of Montana, Wyoming, Colorado, and New Mexico during the breeding season and analyzing their song to determine the number of song types per individual and per population. I will also be calculating the degree of song sharing between populations and within populations. I will collect feather samples to analyze their stable isotopes and determine if each bird is breeding in the same place as the previous year. I predict that migratory rock wrens will share fewer songs but have more song types within a population than non-migratory populations. I expect to find that migratory rock wrens are not philopatric while non-migratory wrens are. Previous studies have focused on pair-wise comparisons of closely related species that are either migratory or not. This will be the first large-scale study to look at the effects of latitude and migration within a species.

BMP signaling in cyst stem cells in the Drosophila testis stem cell niche

Presenter(s): Major III, James

Faculty Sponsor(s): Leatherman, Judith

Graduate Presentation

09:05 - 09:15 in the Morning - Room: Longs Peak

The *Drosophila testis* is a leading model system for studying how tissue stem cells are maintained by the environment where they live, the "niche". Spermatogenesis in *Drosophila* is supported by two stem cell populations, the germline stem cells (GSCs),

which produce cells that become sperm, and the cyst stem cells (CySCs), which produce cyst cells that guide the germ cells through differentiation. Both of these stem cell populations cluster around the hub, where several signaling pathways are involved in controlling GSC and CySC self-renewal. BMP signaling is required in GSCs to maintain self-renewal, and BMP ligands are released from the hub cells and from the somatic CySCs that surround the GSCs (Kawase et al 2004). This requirement for BMP signaling in the GSCs is well documented, but a possible requirement for BMP signaling in CySCs has not yet been examined. It is known that orthologs of *zfh-1*, a protein required for CySC self-renewal, interact in vertebrates with the protein Smad, the intracellular transducer of BMP signaling (Verschuere et al 1999). Our preliminary data indicates that mutant CySCs for the *Drosophila* Smad homologues *mad* and *medea* do not survive as well as control cells, suggesting that BMP signaling may be necessary for proper self-renewal in CySCs. To begin to investigate the role of BMP signaling in CySCs, we bred flies to possess a null allele of the BMP ligand *gbb* (*gbbD4*) and a hypomorphic *gbb* allele (either *gbb3* or *gbb4*). Testes from similar *gbb* deficient flies have a significantly reduced number of GSCs; we plan to examine whether or not CySC self-renewal is also affected by *gbb* deficiency.

Population genetic structure of two sister plant species in the Colorado Plateau

Presenter(s): Bresowar, Jerry, JJ

Faculty Sponsor(s): McGlaughlin, Mitchell

Graduate Presentation

09:15 - 09:30 in the Morning - Room: Longs Peak

The Colorado Plateau flora contains a high degree of endemism, with most of the rarest plants being restricted to uncommon soil types. Thus the Plateau flora holds much potential for studying the role of ecological selection in facilitating biodiversity. Presented here is research using population-level analysis of microsatellite marker data from two closely related Plateau endemics; *Cryptantha paradoxa* and *C. gypsophila* (Boraginaceae). *Cryptantha paradoxa* is more general in habit and occurrence, while *C. gypsophila* is seemingly restricted to gypsum soils of the Paradox Formation of western Colorado. Microsatellite data suggest a genetic distinction between these two species, with the exception of two populations of *C. gypsophila* (based on morphology and habitat) which align genetically with *C. paradoxa*. The results suggest either recent gene flow or persistence of ancestral signal within and between populations, and which doesn't appear to align with the taxonomic identity of populations. This research demonstrates the utility of population genetic data to investigate evolutionary histories in systems where morphology and taxonomy are unclear or obscuring.

Delivering Biology Online

Presenter(s): Ranney, Beverly

Faculty Sponsor(s): Jurin, Richard

Graduate Presentation

09:30 - 09:45 in the Morning - Room: Longs Peak

Online education is an accepted delivery method for content at community colleges. An area that needs addressing is how instructors can provide laboratory experiences to students who may never come to campus due to geographical, economic, or familial considerations. While instructors may ideally want all students to attend an on-campus laboratory course, the reality is that for many students, such a requirement makes completion of an on-campus course unattainable. Currently science is struggling to clearly dialog with the general public regarding scientific findings, what science answers, and how science operates. It is therefore imperative that science instructors, particularly biologists, teach the students we have, not the students we wish we had. Online biology instruction forces us to ask, what is the purpose and value of laboratory activities? Can learning objectives for laboratories be met without students entering a lab?

When combined as a lecture-laboratory course, any learning gains in introductory biology laboratory instruction can be difficult to separate from learning that occurred due to lecture instruction. In an experiment designed to hold learning gains from lecture neutral, students enrolled in an online section of introductory biology taught at a community college were randomly assigned a laboratory treatment. Treatments consisted of at-home kits and virtual simulations. Data was collected for multiple semesters. With the exception of laboratory experiences, students received the same instruction, lecture-based learning activities, and assessments. One group completed at-home kits and a second group completed virtual simulations for the laboratory portion of the course. The BIO-CLASS survey was administered to students at the beginning and end of the course to measure attitudinal changes. Preliminary data analysis suggests that community college students completing virtual simulations for their laboratory experience had higher assessment scores and more positive attitudes about biology content.

Foraging Patterns By Bats in Forested, Edge, and Masticated Ponderosa Pine Forest in Boulder County, Colorado

Presenter(s): Craven, Katelin

Faculty Sponsor(s): Craven, Katelin

Graduate Presentation

09:45 - 10:00 in the Morning - Room: Longs Peak

We investigated bat foraging patterns and insect activities within ponderosa pine woodlands of three stand types: forested, edge, and masticated. To record sonar calls, we arrayed three Pettersson D240x detectors with digital recorders, moving them among

five pseudo-replicated transects and collected insects in forested and masticated stands using black-light traps. Calls were analyzed to species using Sonobat 3.0 and total numbers of calls from 2010-12 were pooled. Overall bat activity was highest in masticated stands (843 total calls recorded), with 369 calls on the edge, and 342 in forested stands. Dunn's test showed that activity was significantly different between uses of masticated stands versus edge ($z=3.63$) and forested stands ($z=3.57$), but there was no significant difference between use of forested stands and edge ($z=0.06$). Species-specific habitat patterns were mostly consistent with accepted norms (clutter specialist, open area specialist, etc), except for *Lasiurus cinereus* and *Myotis ciliolabrum*. In 2010-11 the average insect biomass was lower in masticated than in forested habitat: 2010 showed 276.8 mg (SD=380.9) in forested habitat, whereas masticated areas saw 2.47 mg (SD=6.4); 2011 showed 13.9 mg (SD=5.1) in forested stands and 8.7 mg (SD=6.5) in masticated stands. However, insect biomass was similar in 2012: 14.18 mg (SD=4.30) forested and 14.20 mg (SD=3.15) masticated. We will also present data on bat activity patterns with respect to moon illumination and cloud cover. Forest management treatments that promote habitat mosaics are best for supporting bat species diversity particularly under variable environmental conditions.

Winter carbon dioxide efflux post salvage logging of mountain pine beetle infested subalpine forest

Presenter(s): Beverly, Daniel

Faculty Sponsor(s): Franklin, Scott

Graduate Presentation

10:15 - 10:30 in the Morning - Room: Longs Peak

Soil respiration is the largest carbon efflux in forest ecosystems and is a product of microbial decomposition and vegetative root respiration. Subalpine soil respiration varies with temperature and seasonal fluctuations. Most studies assume winter carbon efflux is zero or negligible, but few studies have accounted for soil respiration under snowpack. The amount of salvage logging is at historic levels, such extensive logging will likely result in alterations to ecosystem carbon budgets. Our objectives in this study were to quantify and compare soil CO₂ efflux beneath snowpack in untreated stands with three salvage logging treatments. Salvage logging treatments occurred between 2007 and 2009. Efflux data were collected from four sites in the northern Colorado Rocky Mountains in the winters of 2010-2011 and 2011-2012. Carbon dioxide effluxes were collected in three different silvicultural treatments and untreated forest stands. An EGM4 IRGA and a modified snow depth probe were used to measure CO₂ concentrations. Snow depths and snow pits were used to quantify respiration occurring at the soil surface. Nonparametric statistics were used to evaluate differences in efflux among treatments. Results from 2011 and 2012 suggest that there was no difference among silvicultural treatments, but carbon effluxes in treated sites were significantly higher than untreated sites. Winter carbon effluxes of subalpine forests were significantly lower than summer effluxes, but respiration through snowpack was significantly higher than previous studies suggest. Based on our calculations, the winter contribution of CO₂ efflux is approximately ten percent of the annual carbon budget for beetle-infected forest. Subalpine forests are covered with snow for six to seven months each year; thus, incorporating winter soil respiration is essential to obtain an accurate carbon budget for subalpine forests ecosystems.

Investigating receptor tyrosine kinase (RTK) signaling pathways in the Drosophila testis stem cell niche.

Presenter(s): Hammer, Kenneth

Faculty Sponsor(s): Leatherman, Judith

Graduate Presentation

10:30 - 10:45 in the Morning - Room: Longs Peak

The *Drosophila testis* provides an excellent model for researching the processes of differentiation and self-renewal of adult stem cells. In this tissue, adult stem cells are located in a specific region, called the "niche", that controls their ability to remain as stem cells or differentiate. This niche controls two populations of stem cells through complicated cell-cell interactions; germline stem cells (GSCs), which eventually differentiate into sperm, and cyst stem cells (CySCs), which differentiate into cyst cells that guide the germ cells through their differentiation. Our lab focuses on the cyst lineage cells, and both self-renewal and differentiation-promoting signals have been identified for this stem cell population. The differentiation-promoting signal for this cell lineage is activation of EGFR, a receptor tyrosine kinase (reference). However, diphosphoERK, the output of EGFR signaling, has been shown to accumulate in both CySCs and differentiating cyst cells, and it is unclear what prevents differentiation in the stem cell population. We have identified several differences between the stem and differentiating cell populations that may influence the EGFR pathway in the choice between self-renewal or differentiation. First, *zfh-1*, a transcriptional repressor, is expressed only in CySCs, where it regulates self-renewal (Leatherman and Dinardo, 2008). There are suggestions in the literature that *zfh-1* influences ERK signaling (Friedman and Perrimon, 2006), and we have confirmed that *zfh-1* inhibits ERK signaling in cell culture. Second, we found that Jun kinase (JNK), which is often stimulated by RTKs, is active in differentiated cyst cells only. Here we show that attenuation of JNK signaling in the cyst lineage does not seem to produce a mutant phenotype, that JNK activation does not appear to change with age. Finally, we have identified another RTK, PVR, that is putatively active in only CySCs, and that may play a role in the choice of stem cell fate.

D1 and D2 dopamine receptor activation differentially affects intrinsic resonance properties in Layer 5 pyramidal neurons of mouse medial prefrontal cortex.

Presenter(s): Leyrer, Jonna

Faculty Sponsor(s): Thomas, Mark

Graduate Presentation

10:45 - 10:55 in the Morning - Room: Longs Peak

In humans, prefrontal cortical areas are known to support spatial and object-related working memory (WM) processes. In mice, working memory is mediated by homologous regions in medial prefrontal cortex (mPFC). While it is well established that WM tasks are critically dependent on optimal levels of dopamine in the PFC, the cellular mechanisms of dopamine actions are currently unknown. Studies in humans and mice have determined that WM tasks are critically dependent on generation of PFC rhythmic activity in the theta and gamma ranges. Rhythm generation in cortical circuits likely involves interactions between intrinsic electrical properties and frequency-dependent synaptic properties. We studied the intrinsic electrical resonance properties contributing to rhythmic activity in layer 5 pyramidal neurons of mPFC in the mouse, and the effects of dopamine on these resonance properties. Whole cell patch clamp recordings were performed from pyramidal cells in coronal slices of mouse medial PFC. We used an Impedance Amplitude Profile (ZAP) protocol to study resonance properties, using a sinusoidal current of varying frequency (1-10 Hz) applied in current clamp mode to measure voltage responses. The responses were analyzed by Fast Fourier Transform (FFT) to generate the ZAP profiles. Resonance was observed in a subpopulation of Layer 5 cells in room temperature recordings that likely corresponds to the theta range at normal brain temperatures. The presence of a hyperpolarization-activated cation current (I_h) accurately predicted whether Layer 5 neurons showed resonance, while a persistent sodium current (I_{Na(p)}) provided an amplifying influence on resonance. Perfusion of the D1 agonist significantly increased the resonant frequency, and perfusion of the D2 agonist significantly decreased the resonant frequency near resting membrane potential. The effects of dopamine receptor stimulation may occur via modulation of the I_h and I_{Na(p)} currents, and may provide a mechanism for dopaminergic modulation of rhythmic activity in prefrontal cortical circuits.

Graphic organizers as a tool to improve students' performance in undergraduate General Biology

Presenter(s): Jurin, Richard; Cleveland, Lacy

Faculty Sponsor(s): Cleveland, Lacy

Graduate Presentation

10:55 - 11:10 in the Morning - Room: Longs Peak

Gleaming from the dual-coding theory, constructivism, and adult learning theory, the researchers of this study sought to examine the role of graphic organizers and concept maps on course grade, higher order thinking, metacognitive strategies, and attitudes in an undergraduate General Biology class. Conducted at a mid-size Rocky-Mountain University, using a quasi-experimental design, a subset of students enrolled in a General Biology Study Skills class served as the treatment group and received instruction on the use of graphic organizers and concepts maps. Those not enrolled in the Study Skills class served as the control. The CLASS-Bio index, a measure of students' attitudes toward Biology was given during both the first and last week of lecture. In addition to comparing their attitudes, an ANOVA was used to compare test scores, exams grades, and performance on higher order thinking questions between the two groups. After each exam, students in the treatment group received a Metacognitive Awareness Inventory; a repeated-measures ANOVA was to detect changes in students' metacognitive awareness. Lastly, survey and interview data will be used to explore how students used graphic organizers and concept mapping in their studying. Preliminary data suggests the use of graphic organizers improve students' test scores and course grades. This data supports both the dual-coding theory and constructivism.

Potential Environmental Impacts of Oil and Natural Gas Development on Proximate Flora

Presenter(s): Hogden, Randi

Faculty Sponsor(s): Franklin, Scott

Graduate Presentation

11:10 - 11:20 in the Morning - Room: Longs Peak

Since the 1990s there has been a push to move out of dependence on foreign oil and into more self-sufficient energy. As a result, natural gas operations have exploded across the United States. In Colorado, over 40% of the state's wells can be found in Weld County. The types of chemicals used in natural gas drilling and fracturing operations in Colorado's Denver Julesburg (DJ) and Piceance Basins have been undisclosed until recently. The DJ basin encompasses the shortgrass steppe of Pawnee National Grassland and contains approximately 20,000 active wells. The types of chemicals used on the well sites could have disastrous affects on individual organisms' health as well as their ecosystems. There are currently 62 active and 29 production facilities located on the Pawnee National Grassland (PNG). Chemical pollutants released from active and producing wells have the ability to deposit (e.g., wet or dry) to surrounding plants, soils or waters. The major concern at hand is how this deposition might affect species and ecosystem health of proximate flora. The goals of the proposed analysis are two-fold: 1) characterize reclamation of vegetation on plugged and abandoned sites, and 2) quantify the deposition and accumulation of pollutants onto proximate flora, blue gramma (i.e., *Bouteloua gracilis*). Wells are grouped into: pre-well, producing since the 80's, producing since the 00's, plugged and abandoned in the 50's and plugged and abandoned in the 80's. Reclamation success will be based on % vegetation cover. Samples of vegetation will be collected and analyzed for heavy metals and technologically enhanced naturally occurring radioactive materials using x-ray fluorescence. Vegetation will also be analyzed for polycyclic aromatic hydrocarbons and volatile

organic compounds using gas chromatography mass spectrometry. The proposed research is necessary to advance knowledge and understanding within fields such as disturbance ecology, environmental science and risk assessment.

Evolution and Biological Roles of Three-finger Toxins in Snake Venoms (families Colubridae, Elapidae, and Viperidae)

Presenter(s): Modahl, Cassie; Mackessy, Stephen

Faculty Sponsor(s): Mackessy, Stephen

Graduate Presentation

11:20 - 11:35 in the Morning - Room: Longs Peak

Three-finger toxins (3FTXs) belong to a superfamily of non-enzymatic proteins found primarily in snake venoms and are named for the distinctive three β -stranded loops that extend from a central core like three fingers of a hand. These toxins are excellent proteins for evolutionary studies because they are under positive selection pressures and show an accelerated rate of directional protein evolution (exon segments experience more mutations than introns). Three-fingered toxins are distributed throughout the advanced snake families Colubridae, Elapidae and Viperidae. However, little is known of viperid 3FTXs, other than that they exist at exceptionally low concentrations in expressed venoms or that they are present as mRNA transcripts only. Currently, there are only five published complete viperid 3FTX gene sequences and all of these are from one rattlesnake species, *Sistrurus catenatus edwardsii*. Using degenerate primers and genome walking techniques, another 3FTX gene has been discovered in the Mojave rattlesnake, *Crotalus scutulatus*. This new 3FTX gene shares similarities to those found in *S. c. edwardsii*, such as identical signal peptide regions, even though these rattlesnakes are distantly related. Enigmatically, 3FTXs do not appear to be expressed in either of these rattlesnake venoms, suggesting that post-transcriptional regulation may limit their occurrence in secreted venom. These results highlight the fact that even among "well-known" protein families such as the 3FTXs, novel 3FTX gene sequences and transcript regulation mechanisms remain to be discovered. Techniques such as mRNA transcript isolation from crude snake venoms and 3'RACE will allow me to screen for 3FTX transcripts in a variety of viperid species. Analyzing these transcripts and 3FTX gene organization will provide insight into the evolution of 3FTXs and their capacity to adopt different biological roles.

Genetic Analyses for Federally Threatened *Sclerocactus wetlandicus* and *Sclerocactus brevispinus* to Understand Diversity and Oil Exploration on Gene Flow

Presenter(s): Hubbard, Ashley

Faculty Sponsor(s): McGlaughlin, Mitchell

Graduate Presentation

11:35 - 11:50 in the Morning - Room: Longs Peak

Sclerocactus wetlandicus and *Sclerocactus brevispinus* are two federally threatened cacti species endemic to the Uintah Basin, Utah. *Sclerocactus brevispinus* and *S. wetlandicus* have traditionally been identified using morphological traits, which can result in misidentification due to hybridization and phenotypic plasticity. Genetic analyses can give a better understanding of the diversity of the species throughout their distribution allowing for more accurate identification of the species. Correct identification is vital to protecting these species as conservation efforts can be focused on pristine populations and conserving unique genetic diversity within the landscape. These two species are experiencing increased levels of habitat disturbances due to oil and energy exploration. Increases in land modification is a cause for concern because it has the potential to increase gene flow between species and the Endangered Species Act of 1979 does not protect hybrid species. Our objectives are to quantify diversity between and among populations while correlating inter-population gene flow to observe potential patterns of impacts of land modification on hybridization. Using genetic analyses on both nuclear (microsatellites) and chloroplast (DNA sequence) regions of the genome I will quantify diversity of populations, directionality of gene flow between populations, and show impacts of oil exploration on gene flow and population numbers. My preliminary microsatellite data shows there is geographic structure to the populations relative to their distribution with no observed species separation. Each population shows levels of genetic markers for both *S. wetlandicus* and *S. brevispinus* suggesting hybridization. Further analyses of more populations and genetic markers can give land managers better insight for which populations should be targeted for conservation and habitat protection.

Activation of Serotonin-2A Receptors Induces Burst Firing in Layer 5 Pyramidal Neurons of the Medial Prefrontal Cortex

Presenter(s): Spindle, Michael

Faculty Sponsor(s): Thomas, Mark

Graduate Presentation

12:45 - 12:55 in the Afternoon - Room: Longs Peak

Serotonin (5-HT) is a phylogenetically ancient neuromodulator that exerts potent top-down control over global brain states via systemic release from the raphe nuclei of the vertebrate hindbrain. Despite its ubiquity in the mammalian brain during waking states, 5-HT is capable of producing a diverse range of effects on neurons through G-protein coupled receptors. The most abundant serotonin receptors in the mammalian forebrain are the inhibitory 5-HT_{1a} and the excitatory 5-HT_{2a} receptors. 5-HT_{2a} receptors are thought to be responsible for the hallucinogenic effects of LSD, psilocybin, and DMT, and the antagonism of these receptors is a component common of atypical antipsychotics. We have discovered that in the presence of synaptic blockers,

the high-affinity 5-HT_{2a} agonist TCB-2 elicits rhythmic oscillatory bursting following 10-20 seconds of an induced spike train in layer V pyramidal neurons of the medial prefrontal cortex of mice. These bursts are comprised of a 15-20 Hz series of action potentials followed by a relatively long inter-burst period. Bursts repeat at a frequency of 1-2 Hz. The data were analyzed by calculating a 4 point moving coefficient of variation (Cv) (standard deviation-to-mean ratio) of the minimal amplitude of inter-spike intervals within 1 minute induced spike trains. The Cv of spike trains were higher in cells treated with 10 μ m TCB-2 and synaptic blockers than cells under control conditions control conditions. Interestingly, TCB-2 did not induce bursting in neurons without synaptic blockers. Inhibitory post-synaptic potentials (IPSPs) that occurred within spike trains significantly reduced Cv in spike trains (n=12, p<.05). Serotonin increases Cv slightly throughout a long spike train, but does not induce bursting in either the absence or presence of synaptic blockers, which is likely due to the activation of the 5-HT_{1a} receptor. Further work in this area will be required to determine the role of 5-HT_{1a} burst suppression.

Fish oils: An approach to alter lipid microdomains on the plasma membrane of bovine luteal cells in vitro.

Presenter(s): Graham, Peter

Faculty Sponsor(s): Burns, Patrick

Graduate Presentation

12:55 - 1:10 in the Afternoon - Room: Longs Peak

Lipid microdomains are microscopic regions of the cell membrane enriched with cholesterol and sphingolipids that couple membrane receptors with downstream signaling pathways. Studies from our laboratory have shown that luteal cells obtained from cows supplemented with fish oils have decreased cell signaling in response to prostaglandin F_{2a}. Fish oils contain omega-3 fatty acids which may affect cholesterol and sphingolipids levels within lipid microdomains resulting in decreased cell signaling. The objective of this study was to examine various doses of fish oil on lipid microdomains in bovine luteal cells. Mixed luteal cells were prepared from four bovine corpora lutea. Cells were incubated in T-25 flasks containing Ham's F-12 medium with 5% fetal calf serum, insulin (5 μ g/ml), transferrin (5 μ g/ml), selenium (5 ng/ml), 100 U/ml penicillin, 0.1 mg/ml streptomycin, and 0.25 mg/ml amphotericin B in an atmosphere of humidified 95% air and 5% CO₂ at 37°C. At confluence, cells (5 \times 10⁴) were transferred to 35 mm round bottom dishes and remained untreated (control) or treated with 10 fold doses of fish oil from 3 \times 10⁻¹ to 3.0 \times 10⁻⁴ % (vol/vol) for 48 h. Lipid microdomains were stained using cholera toxin subunit B Alexa Fluor 555 fluorescent labeling kit and observed using confocal microscopy. For a positive control, a set of dishes were treated with 10 mM of β -methyl cyclodextrin (β -MCD) for 1 h at 37°C, a disrupter of lipid microdomains. Control cells contained punctuated lipid microdomains with high fluorescent intensity. Cells incubated with β -MCD had dispersed microdomains with decreased fluorescent intensity as compared to controls (P < 0.05). Fish oil treatment resulted in a linear dose dependant decrease in relative fluorescent intensity (y = -0.45x + 4.11; P < 0.05). In conclusion, fish oil treatment appears to alter lipid microdomain which may influence signaling pathways in bovine luteal cells.

Prey Resistance and Venom Composition in the Desert Massasauga (Sistrurus catenatus edwardsii)

Presenter(s): McCabe, Thomas

Faculty Sponsor(s): Mackessy, Stephen

Graduate Presentation

01:10 - 01:20 in the Afternoon - Room: Longs Peak

Rattlesnake venom composition often varies among geographically distinct populations of the same species. However, it is not well understood why particular localities show specific venom profiles. This presentation describes a tentative experimental design for investigating the role of prey resistance and susceptibility in driving shifts in venom composition within one population of Desert Massasauga (*Sistrurus catenatus edwardsii*). The study population inhabits a 30,000 hectare plot of land in southeastern Colorado where the landscape is split between areas of short grass prairie and sandhill mixed grass habitat. Previous work in the study plot indicated that massasaugas utilize the Silky Pocket Mouse (*Perognathus flavus*) as prey, and a preliminary toxicity study indicated that these mice are highly susceptible to massasauga envenomation. Interestingly, the area is also well-populated by another potential prey species, the Deer Mouse (*Peromyscus maniculatus*), which has not been noted in Desert Massasauga diet, and this species appears to be resistant to massasauga venom. The proposed project will examine the relationship between toxicity and prey choice in an attempt to elucidate local prey availability as a driver for geographic variation in venom composition. Susceptibility and resistance in the Pocket and Deer Mouse respectively will be confirmed by a controlled toxicity study. It is expected that venom toxicity profiles will correlate with more susceptible prey targets as the costs of foraging and prey capture should be minimized compared to venom resistant prey. A final goal of this project is to investigate the molecular basis for apparent resistance or susceptibility to massasauga venom. All in all, the results from the proposed project promise to add to our growing understanding of this local system and our understanding of rattlesnake venom evolution in general.

Flowering on cue: how competition affects sexual reproduction in creeping red fescue.

Presenter(s): Bretfeld, Mario

Faculty Sponsor(s): Franklin, Scott

Graduate Presentation

01:20 - 01:35 in the Afternoon - Room: Longs Peak

Clonality is defined as the ability of a genetic individual to produce genetically identical modules that have the potential to survive as independent organisms. It has been estimated that approximately 40% of the world's current flora is clonal, including many economically important plants. While sexual reproduction, i.e. flowering, is maintained regularly in many clonal plants, some develop flowers irregularly. Most species of bamboo postpone flowering events for decades with varying hypothesis attempting to explain the evolutionary origin and significance of this behavior.

In the summer of 2012, the competitive abilities of two closely related grass species, "creeping red fescue" (*Festuca rubra*, a clonal species) and "Chewing's fescue" (*Festuca rubra* subsp. *commutata*, a non-clonal subspecies of *F. rubra*), were examined against a non-clonal, closely related grass "sixweeks fescue" (*Vulpia octoflora*) and the clonal invasive "Canada thistle" (*Cirsium arvense*). The very close taxonomic relationship between creeping red and its subspecies Chewing's fescue allowed for a unique opportunity to study the implications of clonality on competition. It was hypothesized that significant differences in resource allocation above- and belowground occur and that creeping red fescue is a better competitor than its non-clonal subspecies. Dry biomass weights were measured and t-tests performed to test these hypotheses.

Results from this study revealed a surprising development. Biomass differences were non-significant but creeping red fescue, which had been grown in the greenhouse for over 16 months to allow for development of underground root connections, flowered in 4 of 18 (22.2%; $p = 0.10$) cases when grown for 3 months in competition with sixweeks fescue. No flowering of creeping red fescue has been observed in the stock population since germination in December of 2010, and no flowering occurred when grown with Canada thistle. These findings suggest that flowering in creeping red fescue is influenced by competition with sixweeks fescue.

Malaria kinase inhibition: a tool for antimalarial drug discovery and elucidation of cell cycle protein expression patterns

Presenter(s): Bullard, Kristen

Faculty Sponsor(s): Keenan, Susan

Graduate Presentation

01:35 - 01:50 in the Afternoon - Room: Longs Peak

The protozoan parasite, *Plasmodium (P.) falciparum*, causes the most virulent form of malaria and is a significant source of mortality in the developing world. Increasing parasite resistance to traditional antimalarials has necessitated the identification of new targets for antimalarial drug design. Protein kinases, which mediate critical cellular processes such as proliferation, growth, and apoptosis, make attractive drug targets as the deregulation of cellular phosphorylation events has been linked to human diseases. In recent years, kinase inhibitors have successfully treated diseases such as chronic myelogenous leukemia and renal cell carcinoma. The unique structural and mechanistic aspects of *P. falciparum* kinases make these proteins attractive drug targets and the inhibition of these molecules may provide a means to examine heretofore uncharacterized mechanisms of cellular regulation. The kinases targeted in this study are those involved in parasite proliferation during replication within human red blood cells. An ATP luminescence assay was used to screen small molecules from three kinase inhibitor-focused libraries against malarial kinase PfPK7 and several small molecules capable of inhibiting PfPK7 in low molar concentrations were identified. Coupling PfPK7 in vitro activity data to in silico small molecule docking studies revealed potential interactions between inhibitors and the ATP binding site of PfPK7. In addition, a SYBR Green I parasite growth assay was used to assess the ability of small molecules to inhibit parasite growth in *P. falciparum* strain W2 blood stage cultures. Finally, disruption of parasite growth with the cell cycle-selective kinase inhibitor Purvalanol B enabled the determination of differences in protein expression between wildtype parasites and Purvalanol B-treated parasites after analysis with shotgun proteomics.

Tests for contaminant exposure and individual effects on bats of Sichuan Province, China

Presenter(s): Heiker, Laura

Faculty Sponsor(s): Adams, Rick

Graduate Presentation

01:50 - 02:05 in the Afternoon - Room: Longs Peak

Environmental pollutants are implicated in the decline of many bat species worldwide. However, the sublethal effects of these contaminants on individuals and populations are largely unknown. To examine non-lethal indicators of toxicity in bats, I will investigate regional differences in bat exposure to heavy metals in the growing industrial city of Chengdu, China (pop. ~14 million). Contaminant levels, exposure levels, and non-lethal assessments of bat health will be compared along a gradient of urban, peri-urban, and forested sites. In summer 2013, I plan to capture Japanese pipistrelles (*Pipistrellus abramus*) in mist nets to 1) collect blood, urine, feces and fur to test for heavy metal exposure and 2) conduct a pilot assay for the effects of lead exposure using the biomarker delta-aminolevulinic acid dehydratase (ALAD) in blood. ALAD activity is directly inhibited by lead, and loss of ALAD function is linked to organ damage in multiple taxa but has not yet been tested in bats. Environmental contaminant levels and potential exposure pathways will be measured in soil, water, air, and insects. Expectations are that heavy metal loads will be highest in bats captured in urban areas, followed by peri-urban areas, and then forested areas. Accordingly, measures of health, including ALAD activity, will correlate negatively with bat toxin loads.

Detecting Geographic Speciation in a Continental Plant Model: Molecular Evidence of Peripatry in Calochortus (Liliaceae)

Presenter(s): Fuller, Ryan

Faculty Sponsor(s): McLaughlin, Mitchell

Graduate Presentation

02:05 - 02:15 in the Afternoon - Room: Longs Peak

A primary goal of evolutionary biology is to comprehend the mechanisms creating species diversity. Peripatric speciation suggests that species arise when small populations become isolated from an ancestral population and differentiate due to no or limited gene flow. *Calochortus gunnisonii* (Liliaceae) resides within the Rocky Mountain Range and the Black Hills of South Dakota. It can be found on grassy hillsides, open coniferous woods, moist meadows, and dry gulches at high elevations from Montana to New Mexico. We will be investigating isolated populations of *C. gunnisonii* residing in the Black Hills. We propose to use a varied set of molecular data to examine genetic patterns of divergence resulting from the balance between isolation and gene flow among populations. Sampling will include populations from the contiguous range within the Rocky Mountains as well as disjunct populations within the Black Hills. Genetic data will be provided for each specimen in two ways. Using nuclear microsatellites, we can gain insight into recent gene flow due to the quickly evolving nature of the alleles. Previous microsatellite markers have not been reported. Hence, we will be designing species-specific microsatellite markers for *C. gunnisonii*. Chloroplast DNA (cpDNA) sequencing should provide a pattern of maternal inheritance and slower evolution rates of these nuclear regions will provide data to project a path of seed dispersal of *C. gunnisonii* over time. Seed dispersal data should anticipate a single, or only a few, cpDNA colonization events of the Black Hills with no evidence of ongoing gene flow. Similarly, we anticipate the microsatellite data to display no or limited levels of recent gene flow between the Rocky Mountains and Black Hills. Evidence for a lack of colonization events and recent gene flow will leave isolation as the reason for divergence and diversification of *C. gunnisonii*'s disjunct populations in the Black Hills.

Comparative Responses of Chickadee Species Due to Flying Predator Stimuli

Presenter(s): Zachau, Chris

Faculty Sponsor(s): Zachau, Christopher

Graduate Presentation

02:30 - 02:40 in the Afternoon - Room: Longs Peak

Social groups of birds from the Paridae family such as chickadees often form social structures, using their calls as a means of communication. The chick-a-dee call produced by black-capped chickadees (*Poecile atricapilla*), for example, can be used to alert the flock to a food source, and has also been shown to signify variation in predators' body size through changes in the specific patterning and composition of calls. Previous research has indicated the alarm calls of such species are universal and can be interpreted across species. The current study seeks to test playbacks of Carolina (*Poecile carolinensis*), black-capped, Mexican (*Poecile sclateri*), and mountain chickadee (*Poecile gambeli*) alarm calls on the responses of wild populations of mountain chickadees. These experiments will be conducted in the sub-alpine forests of Rocky Mountain National Park as well as Roosevelt National Forest in northern Colorado. Given the generalized nature of the alarm calls, it is hypothesized that mountain chickadees will react equally to alarm calls, irrespective of the species of the signaler. Such results would indicate a close evolutionary connection between each species' call structure regardless of their geographic location.

Immune gene expression profiles in Jamaican fruit bats infected with Tacaribe virus.

Presenter(s): Hume, Greta

Faculty Sponsor(s): Schountz, Tony

Graduate Presentation

02:40 - 02:50 in the Afternoon - Room: Longs Peak

Tacaribe virus (TCRV) is an arenavirus isolated from diseased artibeus bats in Trinidad in the late 1950s. TCRV is related to the viruses that cause the South American hemorrhagic fevers (SAHF). The Jamaican fruit bat (*Artibeus jamaicensis*) was one artibeus species infected with TCRV in the original report and it was thought to be a reservoir host of TCRV. However, recent experimental TCRV infections resulted in substantial morbidity and mortality in Jamaican fruit bats with many features that parallel the SAHF. Other work in our lab provided annotation for transcriptome data from *A. jamaicensis* and we are currently developing expression assays to evaluate the host response. Examination of spleen mRNA transcripts from diseased bats has identified increased expression of several immune genes, including some involved in interferon regulation (*Irf2*, *Irf7*), inflammation (*Nfkb1*), lipopolysaccharide sensing (*Tlr4*), B-cell class switching (*Tnfsf8*), T-cells (*Nfatc2*, *Socs5*, *Stat3*, *Rorc*), and apoptosis regulation (*Xiap*). Further work will be performed to examine other genes in these pathways to assess the role of the immune response in Jamaican fruit bats infected with TCRV.

Tracheal Calcification Patterns in the Chiroptera and Insectivora.

Presenter(s): Adams, Rick; Carter, Richard

Faculty Sponsor(s): Adams, Rick

Research Excellence Award Finalist

Graduate Presentation

02:50 - 03:05 in the Afternoon - Room: Longs Peak

Cartilage calcification is considered to be a phenomenon created by mechanical stimulus on the cartilage. Syringeal and tracheal calcification is a distinguishing feature of birds and is suggested to have evolved due to vocalization. There is however little mention in the literature of tracheal calcification in mammals. Bats and birds synchronize lung ventilation with wing stroke to mechanically economize flight, with echolocating bats also recruiting muscles from the abdominal wall to forcefully emit calls. Synchronization of wing stroke and ventilation results in a compressive force on the lungs and bronchi to help expel air. We hypothesized that 1: calcification of the trachea and primary bronchi will occur during the development of flight in echolocating *Artibeus jamaicensis* and be present in the nonecholocating adult *Syconycteris australis* and 2: calcification will not occur in the primary bronchi of the echolocating shrew, *Sorex vagrans*. Tracheae were obtained from individuals from our captive breeding colony of *A. jamaicensis*, two preserved specimens of *S. australis*, and six *S. vagrans* carcasses from an unrelated study. The tracheae were cleared and stained using Alcian blue for cartilage and Alizarin red for calcification. We found that *A. jamaicensis* tracheal rings closest to the larynx calcified first with rings of the primary bronchi calcifying last, this latter calcification occurred as individuals were first able to achieve powered flight. Rings of the trachea and primary bronchi of adult *S. australis* were calcified. Tracheal ring calcification was present in *S. vagrans* but not in the primary bronchi, in fact the cartilaginous rings diminished in size so that the lower trachea and primary bronchi appeared to lack rings all together. These data suggest convergence between birds and bats that allows for economic respiration and vocalization during powered flight by reinforcing the primary bronchi to resist the compressive forces imposed on the lungs.

Molecular basis for prey relocation in viperid snakes

Presenter(s): Saviola, Anthony; Mackessy, Stephen;

Faculty Sponsor(s): Mackessy, Stephen

Research Excellence Award Finalist

Graduate Presentation

03:05 - 03:20 in the Afternoon - Room: Longs Peak

Vertebrate predators use a broad arsenal of behaviors and weaponry for overcoming fractious and potentially dangerous prey, and among advanced snakes, a chemical mode, venom, is commonly utilized. Venomous snakes, however, exhibit two very distinct prey handling strategies, varying from the strike-and-hold behaviors seen by highly toxic elapid snakes to the rapid strike-and-release envenomation seen in viperid snakes. For vipers, this mode of envenomation represents a minimal risk predatory strategy by permitting little contact with or retaliation from prey, but it adds the additional task of relocating envenomated prey which may wander several meters or more from the attack site. This task is further confounded by additional chemical cues, and trails of other unstruck conspecific or heterospecific prey. Despite decades of behavioral work, researchers still do not know the specific component(s) of venom involved in altering the chemical odor leading to successful relocation of the envenomated prey. In the current study we examined behavioral responses of Western Diamondback Rattlesnakes (*Crotalus atrox*) to euthanized mice injected with size-fractionated venom, with snakes responding significantly to only one protein peak. Assays for enzymes common in rattlesnake venoms indicated that this behavioral responsiveness was not dependent on enzymatic activity. Further purification of this significant peak by reverse-phased high-pressure liquid chromatography, mass determination by MALDI-tof mass spectrometry, and N-terminal sequencing identified the proteins responsible for this significant behavioral response as the disintegrins Crotatroxin1 and 2. These findings reveal the evolutionary significance of free disintegrins in venoms as the molecular mechanism in vipers allowing for effective relocation of envenomated prey. In turn, the presence of disintegrins has led to the evolution of a major behavioral adaptation (strike-and-release), characteristic of only rattlesnakes and other vipers. This system of a predator chemically tagging prey represents a novel trend in the

Canyon and Rock Wren Coexistence in the Northern Colorado Foothills

Presenter(s): Warning, Nat

Faculty Sponsor(s): Benedict, Lauryn

Research Excellence Award Finalist

Graduate Presentation

03:20 - 03:35 in the Afternoon - Room: Longs Peak

Canyon wrens (*Catherpes mexicanus*) and rock wrens (*Salpinctes obsoletus*) are two of the least studied Colorado bird species, occurring together in rock-strewn, cliff habitats. Canyon and rock wrens offer a good system for testing how two ecologically and taxonomically similar species partition resources. We identified wren territories on public lands in Larimer County from Apr-Nov 2012. We recorded wren locations using burst sampling and calculated 95% minimum convex polygons in ArcGIS to estimate home range sizes for 12 canyon wren pairs and 17 rock wren pairs. Mean home range size was 7 ha for canyon wrens and 3.7 ha for rock wrens. Considerable home range overlap occurred between species, with 75% (9/12) of canyon wren territories coinciding with those of rock wrens. Rock wren home ranges absent of canyon wrens were 20% larger than those with canyon wrens present, indicating possible interspecific competition. Both species foraged equally on rock surfaces, talus slopes, and in rock cavities (50% of pts). Canyon wrens foraged significantly more within rock crevices (32% of pts), while rock wrens foraged more in vegetation and on open ground (25% of pts). Separate foraging preferences, along with differences in size and

morphology point to some partitioning of food resources in these rock-dwelling wren species. Nevertheless, home range size and foraging analysis data indicate that they compete during periods of co-occupancy.

Does Activation of the Aryl Hydrocarbon Receptor Enhance the Macrophage Response Against Leishmania major?

Presenter(s): Pikalova, Vera

Faculty Sponsor(s): DeKrey, Gregory

Graduate Presentation

03:35 - 03:45 in the Afternoon - Room: Longs Peak

Leishmania is a protozoan parasite that is transmitted to mammals through the bite of an infected sand fly. The primary host cells for Leishmania are macrophages. In the macrophage, Leishmania promastigotes transform into amastigotes and replicate. When amastigotes escape their host macrophage, they can infect other macrophages. Leishmania infection can cause diseases ranging from self-healing to chronic or lethal. 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) is a potent agonist of the aryl hydrocarbon receptor (AhR) that has been shown to reduce the severity of L. major infection. Previous research in this laboratory showed that, although TCDD does suppress adaptive immunity in wild type mice, a decrease in parasite burdens is seen. Moreover, SCID mice that are deficient of adaptive immunity also showed decreased L. major burdens following TCDD exposure. To explore these results we hypothesized that TCDD exposure reduces parasite burdens because it enhances the resistance of macrophages to infection. To test this hypothesis we will examine the ability of L. major to infect human and mouse macrophages, as well as the survival and proliferation of L. major in those macrophages, after exposure to TCDD in vitro. Also, because macrophages can be infected by either promastigotes or amastigotes, we will compare the effects of TCDD on infection by each life stage. We predict that macrophages exposed to TCDD will have lower parasite burdens at all time points.

Business Administration

An analysis of differences in CSR perspectives between Korean chaebols and US multinationals

Presenter(s): Kim, Heera

Faculty Sponsor(s): Wanasika, Isaac

Undergraduate Presentation

01:40 - 01:55 in the Afternoon - Room: Aspen C

The purpose of this study is to provide a comparison between the state of corporate social responsibility (CSR) among US multinational corporations and Korean Chaebols. While US multinationals and Chaebols are increasingly competing in the same markets, they have both evolved under unique conditions and are confronted with unique CSR challenges that have effects on their competitive dynamics. Globalization of CSR is increasingly creating pressure on the Chaebols to adopt western CSR standards and for US multinationals to adopt common standards among their operational units. This is against the background of the role of culture in shaping CSR perceptions. Using archival data, this study analyzes the evolution of CSR among Chaebols and then compares the similarities and differences between US multinationals and Chaebols. Finally, the study highlights the case of differences in CSR practices and initiatives between Apple and Samsung.

Communication Studies

Americana: The Voice of a Legend

Presenter(s): Chaney, Mary Jo

Faculty Sponsor(s): Allen, Lin

Graduate Presentation

01:20 - 01:35 in the Afternoon - Room: Spruce B

Paul Harvey's voice was used in a commercial advertisement by Dodge Ram during the recent NFL Super Bowl XLVII; the title of the commercial was "So God Made a Farmer". In 1978, Harvey spoke at an FFA convention on how God (Christian) needed someone to take care of the land he had created and the tender of the land was called a farmer. This same speech (which he stated he did not compose the majority of) was paired with visual aids and a sense of decorum to tie the farmer to a needed farm companion, a truck. In order, to make the scenes work together rhetorical language and visual aids were used to connect the memories of American's with past/present conservative values, a sense of belonging with the earth, and some religious ties with the founders of this country. In this essay, I am going to look into how style and memory have been used to make this advertisement more than just a commercial, but a homage to the past and a sense of connection to the present and in particular of the Dodge Ram company and its promise to donate money to the Future Farmers of America (FFA). "God said, "I need somebody

willing to get up before dawn, milk cows, work all day in the field, milk cows again, eat supper, then go to town and stay past midnight at a meeting of the school board” (So God made a farmer, 2013).

The Case for Peripheral Cases of Rhetoric

Presenter(s): Carpenter, Elizabeth

Faculty Sponsor(s): Allen, Lin

Graduate Presentation

01:00 - 01:15 in the Afternoon - Room: Spruce C

This paper makes an argument that rhetorical scholars must move in new directions toward peripheral cases of rhetoric because the world has changed so drastically since the days of ancient Greece when rhetoric was born. While the paradigm (or traditional) cases of rhetoric continued to be examined by rhetorical scholars, peripheral cases struggle to be taken seriously within the field of rhetoric. In our modern world art, music, dance, and video games are intrinsically rhetorical and have huge influence over society. This paper applies the theories and ideas of various rhetorical theorists to various peripheral cases of rhetoric in order to reveal the value in these new directions of study for rhetoric.

Don't play Coy Colorado: Gender Communication and the journey of Coy Mathis

Presenter(s): Maynard, Kody

Faculty Sponsor(s): Allen, Lin

Graduate Presentation

03:20 - 03:35 in the Afternoon - Room: Spruce A

Coy Mathis is a six-year-old girl whose voice and story is echoing far beyond the Colorado mountains and is being heard across the country. Coy's story and rights have become a principal case for the Transgender community and social conversation between sex and gender. The media continues to dissect the case, the facts, and the evidence as the Fountain-Fort Carson School District 8 and the Colorado Civil Rights Division bring the humanity of a first grader at Eagleside Elementary School into question. The continued language and communication of gender in the media and legal coverage call several rhetorical theories into question. Through the pinnacle communicative explanations of I. A. Richards, Stephen Toulmin, and Richard M. Weaver, the theoretical construction and justification of purposeful terminology and dialogue is explored. Wearing the lenses of Richard's semantic triangle, Toulmin's participation in the practical argument, to the pillar language of Weaver's God and Devil terminology identification, the conversation of language accountability and selection is charted. Coy Mathis is bringing gender accessible language to the headlines of America. Diagnosing the formulated reactions from legal and media voices through the vantage points of communication theorists Richards, Toulmin, and Weaver will allow for the academic voice to find some naturally engrained reasoning for the current social dialogue.

From Birthday Party to No Party: A Tale of Misunderstanding and the Semantic Triangle

Presenter(s): Terhark, Summer

Faculty Sponsor(s): Allen, Lin

Graduate Presentation

02:20 - 02:35 in the Afternoon - Room: Spruce B

"A study of misunderstanding and its remedies" (Brummett, 703). Such few words to describe rhetoric may be due to the philosophy of the 850 word Basic English proposed by Ogden and Richards, but may also serve as one of the most fitting definitions of what happens during the process of communication. From the Bermuda Triangle to the semantic triangle, understanding these mysterious shapes can provide rich insight into human misunderstanding. In this thought piece regarding the rhetorical theorist I.A. Richards, I explore his theory of meaning in order to model misunderstanding using a real life application. Through the use of the semantic triangle, the idea of engram, and the Proper Meaning Superstition, I demonstrate how misunderstanding can occur and then be remedied among a group of friends who all have a different idea of how a birthday party might play out.

Meaning of Movement; An Examination of the use of Metaphor in Pilates Discourse

Presenter(s): Bigas, Angelina

Faculty Sponsor(s): Allen, Lin

Graduate Presentation

03:40 - 03:55 in the Afternoon - Room: Aspen C

The central purpose the paper is to evaluate the use of metaphoric cues as exercise instruction within Pilates discourse. Pilates is a precise and purposeful medium of exercise, and therefore the instructions given from teacher to student must guide intentional, purposeful movement. For this paper, I have used the contentions of communications theorist, I.A. Richards to examine his claim that metaphor brings wholeness to an experience, and is central in creating meaning. Metaphoric cues used in this paper are taken from the Ph7 Pilates Manual. The final conclusion of the paper maintains that the use of metaphor within Pilates discourse plays a central role in creating meaning that inspires purposeful, deliberate action.

Synthetic Marijuana: Dissuading Teenagers from Using the Synthetic Drug through the Lens of Toulmin

Presenter(s): Berry, Ian

Faculty Sponsor(s): Allen, Lin

Graduate Presentation

03:00 - 03:15 in the Afternoon - Room: Spruce B

According to Jaslow (2012), synthetic marijuana consumption among teenagers has increased dramatically within the last year. The drug has been considered highly addictive and can cause serious health problems among users, especially teenagers (Jaslow, 2012). Currently, the government has not classified synthetic marijuana as an illegal drug and it can still be purchased today by anyone regardless of age. This raises serious concern about the regulation of such a dangerous drug because it's legal, can be accessed by anyone, and cannot be discovered through a drug screening test. This means that teenagers, especially teens who are on probation, can abuse the drug without ever being caught.

Through an inquiry on Contemporary Perspectives on Rhetoric, one individual will be introduced and featured as the focal point towards this argument. Toulmin and his rhetorical perspective on The Uses of Argument model can be applied directly to synthetic marijuana and the recent abuse history that teens are currently credited for. The purpose for incorporating Toulmin's Model will help ground the claims of why synthetic marijuana is so dangerous. Toulmin's Model will also help discourage teenagers from experimenting with this drug as well as informing them of its highly dangerous attributes.

Counseling Psychology, Gerontology

The Experiences of Older Men in Later Life Relationships

Presenter(s): Sones, Janae

Faculty Sponsor(s): Kings, Jeffrey

Graduate Presentation

11:40 - 11:55 in the Morning - Room: Aspen C

"One of the unique characteristics of the aging Baby-boomer cohort is their less traditional experiences with marriage. In 2009, a third of the Baby-boomers were unmarried, of which 58% were divorced and 32% had never married. Thus, it seems appropriate to begin addressing the changing relationship dynamics of older adults. Existing research on later life repartnerships largely focuses on: discovering reasons for repartnering; establishing predictors for repartnering; and exploring the forms these relationships take. While some studies have exclusively explored older women's experiences in later life relationships, no study could be found that focused solely on these experiences for older men. Because of the unique challenges aging brings to older men, this same degree of keen attention is needed.

Thus, the purpose of this phenomenological pilot study was to understand and describe the experiences of older men in later life repartnerships, including reasons for entering into and unique meanings associated with the relationship. Additionally, it explored how later life relationships differ from previous relationships in terms of perceived roles and responsibilities. The study employed a constructivist and interpretative theoretical framework, congruent with the purpose of a phenomenology. The participants were three older (85+) men who were currently in a dating relationship.

Unstructured, 60 and 90 minute interviews were conducted. Guiding themes for the interviews included: meanings associated with current and past relationships; reasons for entering into and staying in a relationship; and how later life relationships impacted a participant's identity. Six broad themes emerged: Maintaining a Nest; Independence; Adaptability; Companionship/Partnership; Avoiding Reclusiveness; and Being a Provider. These findings strongly suggest that older men seek elements of continuity and discontinuity among their current relationships in terms of their meaning and reasons for seeking a relationship.."

Criminal Justice

Effects of Race Primes on Violent and Nonviolent Crime Judgments: Exploring Implicit Measures of Race-Crime Congruency

Presenter(s): Provenza, Karlee

Faculty Sponsor(s): Peterson, Eric

Undergraduate Presentation

03:40 - 03:55 in the Afternoon - Room: Columbine A

Scholars have found higher conviction rates among defendants in mock jurors when racial stereotypes are congruent with the crime charged (Jones & Kaplan, 2003), an effect called race-crime congruency. Because of our cultural stereotype of African Americans as violent criminals (Trawalter, Todd, Baird, & Richeson, 2008), we set out to test the impact of race-crime congruency on implicit or automatic levels of cognitive processes. Participants will be primed with violent or nonviolent crime words below

conscious awareness, and then complete a dot-probe paradigm, designed to examine which face they fixate on. We hypothesize that participants will show a tendency to bias towards black faces after being primed with violent crime words and participants who are primed with nonviolent crime words will bias toward white faces. If our hypotheses are supported, data will suggest that Caucasian male jurors may hold an implicit stereotype of African Americans as violent criminal offenders and European Americans as nonviolent criminal offenders. Implications of these results will be discussed.

Dietetics

Community Research Partnership for Mental Health - Light Bulb Moments

Presenter(s): Clark, Alena; Geonnotti, Emily; Murphy, Hannah; Gehr, Michele; Nieft, Jocelyn; Anthony, William

Faculty Sponsor(s): Clark, Alena

Undergraduate Presentation

10:00 - 10:35 in the Morning - Room: Aspen C

Multiple Session Presentation - Sessions 4, 5

When investigating the connection between healthy eating, physical activity and mental health, it is clear that one group of people who would benefit from increased attention regarding this topic is individuals with severe mental illness. Individuals who experience mental illness are at greater risk for additional health problems and premature death when compared to the general population. During the 2013 Spring Semester, a nutrition and physical activity intervention is being conducted at the Frontier House, a clubhouse for individuals with severe mental illness. Healthy cooking classes and physical activity assessment are being implemented. A panel presentation of undergraduate research assistants will discuss the demographics of the population they are currently working with and lessons learned ("light bulb") when presenting nutrition information to individuals with severe mental illness.

Using Gluten-free Flours, Hydrocolloids, or Food-based Fat Substitutes in Baked Products

Presenter(s): Anthony, William; McCann, Caitlin; Munn, Kelsey; Nelson, Staci; Silliman, Mallory

Faculty Sponsor(s): Gould, Susan

Undergraduate Presentation

01:20 - 01:55 in the Afternoon - Room: Spruce A

Multiple Session Presentation - Sessions 12, 13

Developing healthful recipes meeting dietary restrictions, such as gluten-free or reduced-fat baked products, is challenging because of the appearance, texture, and taste properties these ingredients provide. Five recipe-modification research projects will be presented that demonstrate this process, two for gluten-free and three for reduced fat. For each baked product three substitutions were made and compared to the original using objective and/or subjective (such as taste panels) evaluations. White rice, chickpea, and almond flours in banana bread were compared to the original using wheat flour; participants were unable to determine the original recipe. The second researcher used different hydrocolloids (binding agents) in banana muffins. Greek yogurt, applesauce, and bananas were used for all the oil in a carrot cake recipe and produced varied results. Different fruit purees were used to prepare chocolate chip cookies; however, the original recipe was preferred. Progressive amounts of pinto bean puree were substituted for comparable measures of the butter in a chocolate cake recipe; the partial substitutions produced the most acceptable products while decreasing total kilocalories, fat, and saturated fat. Specific methods, results, conclusions and applications and recommendations are presented for each product.

Economics

An Analysis on the Chinese Hukou System and its Role in Chinese inequality

Presenter(s): Ballard, Ryan

Faculty Sponsor(s): Low, Michelle

Undergraduate Presentation

03:20 - 03:35 in the Afternoon - Room: Spruce C

This paper analyzes China's hukou system and its social and economic impact. The hukou system was originally implemented in 1958 to balance the flow between the rural and urban populations. However, there has been criticism that the system is outdated and should be dismantled. In this study, I utilize data from the Chinese household survey that is selected from larger samples drawn by the State Statistical Bureau. Furthermore, I examine case study interviews of managers and employees at 12 specific firms to show how the current hukou system has generated a division between the rural population and the urbanites and exacerbates the growing inequality within the Chinese population. Through an examination of historical, political, and cultural circumstances of the hukou system, as well as current data that relates hukou classification with the number of persons hired, average salary, number of persons in higher positions, benefits, etc., I discuss the relevancy of the hukou system as it stands today.

Educational Leadership

A Narrative Inquiry into the Academic Experiences of Female Saudi Graduate Students at a Comprehensive Doctoral Institution in the Western US

Presenter(s): Sandekian, Robyn; Keen, Katee; Weddington, Michael

Faculty Sponsor(s): Birnbaum, Matthew

Graduate Presentation

03:40 - 03:55 in the Afternoon - Room: Spruce A

Enrollment of Saudi students in US colleges and universities has nearly tripled during the past five academic years and is expected to continue growing because of funding provided by the King Abdullah Scholarship Program (KASP). Among those students, the number of Saudi women is also increasing due to the loosening of Saudi Arabia's long-standing restrictions on women's travel and acceptable fields of study and career. However, our review of the literature found limited information about how female Saudi students experience the adjustment from gender-segregated classrooms in Saudi Arabia to the mixed-gender classrooms they encounter in the United States of America (US). This constructivist study highlighted some of the academic experiences of four female Saudi graduate students at a comprehensive doctoral university in the western US, known in this study by the acronym CDU. . This study furthered our understanding of Saudi females' academic experiences. Challenges caused by students' insufficient English language skills, differences in their comfort levels interacting with American and Saudi men, and positive, personal relationships with both male and female faculty members emerged as themes within the data. Based on these women's stories, we proposed recommendations for educators who work with this unique population.

Educational Psychology

Standards Based Assessment in Charter versus Public Schools: A Meta-Analysis of Arizona's Instrument to Measure Standards

Presenter(s): Diaz, Abel

Faculty Sponsor(s): Cochran, Kathryn

Graduate Presentation

11:00 - 11:35 in the Morning - Room: Spruce B

Multiple Session Presentation - Sessions 7, 8

The present study used meta-analytic methodology to synthesize results from a norm-referenced assessment required by the state of Arizona in reading proficiency. The data for the meta-analysis came from the 2010-11 Arizona's Instrument to Measure Standards (AIMS) test results. In the present research, we used meta-analysis to clarify whether or not the number of students passed in reading assessment differs by school type (charter/public). A total of 1,466 schools across grade level 3-8 were compared by school type assessing reading. The average mean of students passing in charter schools across grade level was 36 students; the average mean of students passing in public schools across grade level was 94 students. The analysis found that charter schools underperform public schools in reading assessment reflected by a pooled effect size of -0.99. A sub-group analysis found that grade level does not significantly influence the number of students passed in reading assessment for charter and public schools ($p > .001$). We conclude that there is a difference in school type (charter/public) for standard based reading assessment.

Educational Studies

From Theory to Practice: Learning How to Teach in a Newcomer ELLs Classroom

Presenter(s): Rossman, Karisa; Pompey, Rose; Freeman, Sierra; Potter, Shawna

Faculty Sponsor(s): Cibils, Lilian

Undergraduate Presentation

11:00 - 11:35 in the Morning - Room: Aspen A

Multiple Session Presentation - Sessions 7, 8

The students on this panel, a group of pre-service teachers pursuing an endorsement in Teaching English to Speakers of Other Languages in the Department of Hispanic Studies, will discuss the process of learning how to teach in a newcomer classroom. As part of their TESOL program, the speakers completed their TESOL practicum in the context of a newcomer English language learners (ELLs) classroom in an elementary school, a middle school or a high school in the Greeley area. Newcomer students

arrive in the US with varied formal educational and literacy experiences: they may have no schooling experience; they may have begun school in one place and moved continually; or they may have attended school regularly in their native countries. In working with newcomer ELLs, the presenters adapted the theoretical and practical knowledge acquired in their studies to the unique challenges newcomer students need to overcome when entering the US school system. Participants will discuss the process of moving from theory to practice in their experiences as practicum students.

Educational Technology

Comparing ADIE, Prototyping, Spiral, Quality Matters models, and providing a mixed course design approach

Presenter(s): Siddiqui, Altaf

Faculty Sponsor(s):

Graduate Presentation

02:00 - 02:15 in the Afternoon - Room: Spruce A

This research compares the traditional course design approaches, their differences, similarities, and their pros and cons that exist in the industry today. Some of the design methods discussed include, ADDIE, Spiral Model, Prototyping, Pebble-in-the-pond, and Quality Matters™ rubric. There exist many myths about these methods which are clarified in the research. Each of these course design methods is best suited in a certain portion of a course. Most of the course designers end up using one approach or the other religiously to the full extent without realizing its weak aspects. Students' participation is neglected in most of the course designs that are offered in the higher education today. This trend has made students feel left out in their own field of study making them obligated to finish a course regardless of their liking or learning. This research proposes a diverse team of instructional designers, faculty, and students for a course design to be successful. Such a team would design a course that has a better chance of success than what exists in the higher education. An example for which the author was a part of at UNC with a similar team is included in this research. A discussion about Spiral methodology which had been considered useful for the field of Software Engineering only has also been included. Spiral methodology had already been applied in the design of courses and has been revisited in this research. Finally, this research proposes a mixed and iterative course design approach for the future. It consists of the strengths filtered from most of the design methods and has a better chance of success. The research concludes a step-by-step action plan for easy implementation and future research. This research was conducted by focusing on the course designers in the higher education, industry and high school educators alike.

English

English Graduate Panel: A Game of Rhetoric: Incorporating Rhetoric and Design into Required Composition Courses through Video Game Play

Presenter(s): Vance, Bremen; Macey, Renee

Faculty Sponsor(s): Kraver, Jeraldine

Graduate Presentation

01:40 - 02:15 - Room: Spruce C

Multiple Session Presentation - Sessions 13, 14, 15, 16

Because writing instructors cannot predict the rhetorical occasions that students will face after leaving the classroom, designing a curriculum that meets these goals can be difficult. Digital technologies have further complicated the nature of writing by adding additional communication possibilities and dangers. My research begins from the assumption that students will enter numerous rhetorical situations with a diversity of conventions. As such, students will need to learn to embrace the established conventions of each discourse community by learning to recognize patterns and communication strategies. In this project, I show that popular video games like World of Warcraft, alongside related texts, are an ideal vehicle for this end.

In 1996, The New London Group published "A Pedagogy of Multiliteracies: Designing Social Futures" to address the changing needs of students in modern writing classrooms. The article introduces the concept of "Design" as a cornerstone for writing instruction. The design principle expands traditional notions of literacy to include any object designed for communication purposes. However, the article lacks a practical framework for the classroom. The work of James Paul Gee connects the principle of design to video games and argues that video games teach players to recognize patterns and structures, this project illustrates a method for incorporating video games into writing instruction to help broaden student conceptions of literacy and encourage reading practices that help students see themselves as designers of meaning. Additionally, this project develops a practical framework for writing instruction that accounts for the diversity of student needs in first-year college composition courses by advocating a pedagogy of "Self-Sufficiency," an ability to navigate discourse borders by recognizing discourse patterns.

English Graduate Panel: Facebook Official: How Social Networking Helps Build Community in the Classroom

Presenter(s): Vance, Bremen; Macey, Renee

Faculty Sponsor(s): Kraver, Jeraldine

Graduate Presentation

02:20 - 02:55 - Room: Spruce C

Multiple Session Presentation - Sessions 13, 14, 15, 16

The writing classroom can be an intimidating place for students. As a result, they can become uncomfortable, and even worse, alienated. One way to address these possible issues is to build a successful community. By incorporating a Facebook "Group Page" for my class, having students read and respond to critical and analytical essays about social media in general and Facebook in particular, and having students use their personal Facebook pages as a subject of study, my project explores three questions. First, can a social media component to my classroom enhance the students' learning experience by facilitating community in the classroom? Next, can it give them a more positive outlook on first-year composition? And, finally, can using and studying Facebook provide students with some essential skills for the lives that await them outside the university? In order to explore these questions I decided to use my Fall 2012 ENG 123-018 class as the source of my research. In this project I explain the importance of community, what Facebook offers the writing classroom, and my classroom based research.

ESL

Developing Curriculum to Support Language and Diversity in Classrooms with English Learners

Presenter(s): Babbitt, Haneen; Braaten, Leah; Coler, Kaitlyn; Combs, Kori; Devores, Janelle; Finke, Natalie; Jessup, Faith; Marques, Sandi; Ramirez, Cecilia; Soto, Yessenia

Faculty Sponsor(s): Franklin, Elizabeth

Undergraduate Presentation

10:40 - 11:55 in the Morning - Room: Spruce A

Multiple Session Presentation - Sessions 6, 7, 8, 9

The development of curriculum is one of the most important types of research that classroom teachers do. In TESL 400 Methods and Approaches to ESL/EFL undergraduate teacher candidates earning an endorsement in English as a second language (ESL) develop multicultural curriculum focused on topics and standards related to immigration, migration, and Diaspora communities. These topics are especially important to the students in our schools who are learning English as a new language. The panelists and their specific topics for this hour and 15 minute presentation are:

1. Sandi Marques, Natalie Finke, and Kori Combs will talk about materials for teaching the immigration of the Pilgrims and strategies for integrating math and science. (10 minutes)

2. Hope Weaver will discuss materials for teaching about the Potato Famine, Irish immigration, and the integration of science. (5 minutes)

Break/Questions

3. Haneen Babbitt and Leah Braaten will discuss the religious-based migration of three different groups and activities and resources to teach math in this context. (10 minutes)

4. Kaitlyn Coler will demonstrate the use of an art activity to help students understand the reasons for the Spanish Inquisition (5 minutes)

Break /Questions

5. Yessenia Soto and Cecelia Ramirez will demonstrate how to incorporate the use of Spanish in curriculum about the Gold Rush so that English learners can better understand content. (10 minutes)

6. Janelle Devores will illustrate how teachers can use primary and secondary historical sources in lessons about immigration after the Holocaust (5 minutes)

Break/Questions

7. Faith Jessup develops curriculum focused on creation myths and ways to teach language by having students create a mad lib. (10 minutes)

8. Conclusion

Questions

Linguistic Explorations and Considerations for Teaching English as a Second Language in K-12

Presenter(s): Romero, Deborah; Weaver, Hope; Manoles, Ruby; Ramirez, Cecilia; Jones, Lindsay; Barron-Avila, Alejandra; Lundeen, Abigail; Cerny, Emily

Faculty Sponsor(s): Romero, Deborah

Undergraduate Presentation

09:20 - 09:55 in the Morning - Room: Columbine B

Multiple Session Presentation - Sessions 2, 3

In this presentation undergraduate students, who are all pre-service teachers pursuing an endorsement in Teaching English as a Second Language, will present findings from their linguistic investigations and observations of learners of English as a Second Language.

In recent years the K-12 demographic explosion in Colorado has yielded over 200% growth in English language learners in schools across the state. This change in linguistic and cultural diversity puts increasing importance on the preparation and graduation of qualified teachers, who possess sound knowledge about how to engage and teach diverse students and the need for an increased understanding about how students in K-12 acquire a second language.

Presentations are informed by students' observations and qualitative data that is used to examine different linguistic features, patterns and challenges found in English learner language across speakers of other languages. Students will consider in their findings the emergent nature of English across learners of English who speak Spanish, Korean, Somali and other languages. Based on these findings students will propose sound instructional activities that might be deployed in the classroom to support and promote language acquisition and development. These activities will be informed by a sociopsycholinguistic and systemic functional approach to language, and will seek to actively engage students in the scientific exploration and discover of language as an object of, and vehicle for, knowledge construction and development.

Geography

Out From Under the Cosh: The Impact of Football on English Working Class Identity through Cartoons, 1900-1925

Presenter(s): Karp, Matthew

Faculty Sponsor(s): Seegel, Steven

Research Excellence Awards Finalist

Undergraduate Presentation

11:00 - 11:15 in the Morning - Room: Council Room

This study examines the impact of football on English identity from 1900-1925 through the concepts of space and place. It is significant because of the narrow view on the subject of previous research and the social importance of football in modern England. Prior research regarding football and English identity focuses on football as the "working man's game" and highlights the development of a working class identity, in opposition to upper and middle class identities, through football. Unfortunately, it is difficult to find primary sources on this subject from the first quarter of the twentieth century in order to gain a more holistic understanding of the subject. In order to discover more about football's impact on English identity from 1900-1925, this study uses cartoons published in English newspapers as primary sources to discover a more comprehensive sense of football's impact on English identity. This analysis shows: 1) Football was generally played and supported by working class males; 2) Football divided England by city, borough, and region through allegiances to various professional football clubs; 3) Football further developed an English identity for white working class males through the England national team. I explain these discoveries through various geographic theories in order to show how football in England simultaneously divided and united Englishmen. This study then applies theories such as topophilia, place pride, the theory of hegemony, and visibility based on the works of the of Yi-Fu Tuan, Stuart Hall, and John Bale, in order to understand how space and place allowed football to influence English working class identity from 1900-1925.

Gerontology

Experiences of Fire Survivors and Disaster Mental Health

Presenter(s): Seeley, Austin

Faculty Sponsor(s): Karlin, Nancy

Research Excellence Award Finalist

Undergraduate Presentation

10:40 - 10:55 in the Morning - Room: Council Room

The current study is interested in how age, social support, self-efficacy, and depression are related to resilience specifically in the case of the Colorado fire victims in 2012. These factors assume roles within the Life Course Model which makes it a useful tool in advancing our understanding of resilience in disaster victims and constructing a theoretical framework to guide further research. Considering the factors of age and social support, research suggests that social networking and family support are particularly important for older adults (Kamo et al., 2011). Extended families and neighbors are of specific importance because their social contribution is key in maintaining mental health of older victims (Shenk et al., 2009). The results for social support and level of resilience reported are mixed. However, the importance of social support for older individuals seems to be even more relevant considering the study by Gooding et al. (2012), which reports younger people actually had more resiliency related to social support than older adults. Further investigation on social support and impact on elders appears relevant. Depression appears to

also be an important factor in resilience particularly if there is depression prior to a disaster (Ginexi et al., 2000). Depression is a factor related to overall levels of resilience following many types of life events (Taylor et al., 2011) and deserves consideration with survivors of fire. Overall, review of the current literature suggests that limited research exists in the area of disaster relief for fire victims. For quantitative data obtained from the survey a Multiple Linear Regression (MLR) was used to build a predictive model of resilience using scores on the four instruments for self-efficacy, depression, social support and resilience. Qualitative data from the open-ended questions was analyzed using theme analysis in other words identifying, analyzing, and reporting patterns (themes) within data.

Higher Education & Student Affairs Leadership

Already On the Outside: Feminist Identity Development Among Women on a College Campus

Presenter(s): Koppel, Lauren

Faculty Sponsor(s): Hawthorne, Barbara

Research Excellence Award Finalist

Undergraduate Presentation

10:00 - 10:15 in the Morning - Room: Council Room

Being a feminist like any social constructed identity is not essential to the character but rather develops throughout time. The body of literature around Feminist Identity Development frequently features college women as participants and yet the literature has a conspicuous absence in examining how the factors present on a college campus assist Feminist Identity Development. A review of semi-structured hour-long interviews with three self-identified feminist women, anthologized accounts by feminists, and a review of college campus environments will better inform the literature around Feminist Identity Development in regards to the role of the college campus. My study indicates that the college campus does assist Feminist Identity Development through exposure to sexism and feminism, the ability to create safe space and engage in discourse, and the opportunity for self-reflections and synthesis of identity. One of the birth places of feminism is the American College Campus. To achieve feminist goals in American society means fostering and promoting feminism on college campuses.

Gella! A Partial Life Story of Alice (Staab) Gerstner Through Narrative Inquiry

Presenter(s): Mildrexler, Janella

Faculty Sponsor(s): Lahman, Maria

Graduate Presentation

09:20 - 09:35 in the Morning - Room: Aspen C

As part of a Dr. Lahman's Narrative Inquiry class, I documented my husband's fraternal grandmother's family, the Staabs. "Gella! A Partial Life Story of Alice (Staab) Gerstner Through Narrative Inquiry" is an in-depth narrative research study of a life history. Alice (Staab) Gerstner was born in 1925 and is the sole survivor of eight (8) children. Due to a lack of remaining family members, the family has less formal information about the Staab side. Therefore, I conducted a series of interviews to elicit specific Staab family history information. In this presentation, I discuss the interview process, the diversity of participants's stories and the ethical concerns regarding interviewing the elderly and family members.

History

Changing Tides: The Evolution of the Maoist Education System in China, 1898-1968

Presenter(s): Eglund, John

Faculty Sponsor(s): Fong, Adam

Undergraduate Presentation

01:20 - 01:35 in the Afternoon - Room: Columbine B

This paper will analytically and historically examine the change in trends of educational reform in China over the first half of the twentieth century. The last years of the failing Qing Dynasty marked the end of an era for Chinese education, and opened the way for a move away from a system concentrated on Confucian values and calligraphy towards one of practical education and tangible benefits the nation—at least, for Communist thinkers. Analyzing primary sources, including the writings of educators and thinkers of the late Qing, students in the early 20th century, and the writings of Mao, reveals three major stages in this transition: establishing a Chinese identity, determining the role of students in society, and an assessment of practicality in the education system. This transition shapes Chinese ideas about their language history and culture, and moves it away from merely copying Western models and towards an indigenous understanding of modernity. This paper contributes to scholarly debates on modernizing twentieth-century education, Communist implementations of change, and the importance of students in transforming post-Imperial China.

Dancing Again: History, Memory and Activism at Wounded Knee

Presenter(s): Volzke, Owen

Faculty Sponsor(s): Fischer, Fritz

Undergraduate Presentation

11:40 - 11:55 in the Morning - Room: Columbine B

Dancing Again: History, Memory, and Activism at Wounded Knee

Author: Owen Volzke

This study examines the role history and memory played in the 1973 occupation of Wounded Knee by Oglala and other Native American protestors. Previous histories of the event focus largely on the role of the American Indian Movement, while overlooking those factors capable of motivating Oglala citizens to risk their lives in protest against the United States. This paper aims to understand the relationship between the history of United States-Oglala relations and the collective memory of those Oglala protestors both within and around Wounded Knee. Through examining newspaper articles published from within Wounded Knee, as well as congressional hearings and several participant autobiographies, this case study seeks to better understand the Wounded Knee occupation as viewed through a lens of historical and memorial motivation. The research demonstrates that a historical and memorial understanding of Lakota culture and relationship with the United States played a critical role in the identity protestors consciously sought to create and define for themselves during the occupation. In particular, the Fort Laramie Treaty of 1868 and the Wounded Knee Massacre of 1890 provided key events that, while interpreted and utilized for varying purposes, helped legitimize the struggle of Oglala protestors as they sought an improvement in their immediate living condition. Furthermore, Oglala protestors sought and consciously cultivated the revival of a Lakota culture long dormant or suppressed within the Pine Ridge Reservation, with memories of Lakota tradition passed down through tribal elders providing the crux upon which this new culture rested. Although ultimately unsuccessful in its immediate efforts, the Wounded Knee occupation demonstrates the inherent power associated with historic interpretation and memorial remembrance, particularly when applied towards the creation of new collective identity rooted in the past and directed towards the future.

Disrupted Notions of "The Other" in the East African Campaign of the Great War

Presenter(s): Taylor, Nicole

Faculty Sponsor(s): Clinefelter, Joan

Graduate Presentation

11:40 - 11:55 in the Morning - Room: Spruce B

The African front of the First World War is a subject that has been largely overlooked by historians due to its secondary status during the war and lower casualties. Scholars today, however, are attempting to give attention to global events previously seen as peripheral. The blending together of nineteenth century colonial warfare and twentieth century industrialized warfare resulted in complex relationships between the different groups fighting in Africa. The war both disrupted and confirmed colonial relationships and concepts.

Drawing largely upon primary source written accounts, this paper will treat the rather unique experience faced in prisoner-of-war camps of the East African Campaign whereby the colonial positions previously given to all the different people groups present in a colonial space were seriously stretched and, at times, unhinged. This had a deep impact on both the colonial powers and Africans who were a part of the POW camp system, whether as prisoners, guards or merely witnesses. The concept of "the other" was no longer simply defined by race or ethnicity, as had been the case in colonial warfare in decades preceding the war. The crisis of the First World War in East Africa redistributed positions in society, albeit temporarily, in such a way as to confuse who was the insider and who was the outsider in the different groups and in their relations with one another. This paper argues that at moments of key contact during the war, such as in the POW camps, the colonial overlords, that is the British and the Germans, were unable to hold firmly onto the strict colonial roles that they had assigned to themselves and to the indigenous African people. This would have lasting effects on the way that indigenous African people viewed their own roles as well as the roles of their colonial rulers.

Evidence of the Holocaust in Lithuania, Latvia, and the Soviet Union

Presenter(s): Dickson, James

Faculty Sponsor(s): Clinefelter, Joan

Undergraduate Presentation

03:00 - 03:15 - Room: Aspen A

The Holocaust was arguably one of the worst examples of genocide in the history of mankind, yet it is difficult for students to fully grasp the impact of the atrocities committed during the Second World War without visual representation. During the Summer of 2012, I did a Directed Study (HIST 422: GIS and History) under the direction of Dr. Joan Clinefelter, the Chair of the History Department at the University of Northern Colorado. Dr. Clinefelter provided me with the "Jager Report", which was a Nazi S.S. Document that gave a detailed account of the genocide throughout Lithuania, Latvia, and Soviet Union during the Summer and Fall of 1941 in the height of the Einsatzgruppen massacres throughout that region of Europe. Using this document, I created a variety of maps that showed how many Jews and other "Undesirables" the S.S. Units murdered during that period, including place, time, and geographic representation. I was fortunate to have support from the UNC IT Department and Dr. David Diggs in

the Geography Department. To create my research, I used ArcGIS and Excel Spreadsheets. This spatial analysis has quite possibly been one of the most significant academic projects that I have had the opportunity to be a part of. Historical Geographic Information Science (GIS) is really a brand new field of Academia and this project shows how visual representation of historical events could be the future of teaching History on a Secondary and Post-Secondary level. This project is only breaking the ice in the field, but if given the opportunity to present to an audience I know that the research that I worked very hard towards could have an impact on the understanding of the Holocaust and have future implications related to Historical GIS.

Evidence, Religion, and Gender in the English Reformation: The Case of Anne Boleyn

Presenter(s): Deselms, Alexandra

Faculty Sponsor(s): Wieben, Corinne

Undergraduate Presentation

09:40 - 09:55 in the Morning - Room: Aspen B

Anne Boleyn is a source of constant fascination because upon further investigation, she emerges as a complex person that researchers enjoy discovering. As the embodiment of the break of the English Church from Rome, she was a target of those who believed she was an usurper and those who wanted the break to go farther. One of the common assumptions is that Anne was a Protestant but recent works by George Bernard test that assumption. This research project enters into the debate on Anne's religion with a further examination of the authors of the evidence as well as gender theory about women on both sides of the reformations. The focus of the research is on primary sources connected to Anne and the work is supported by secondary sources and works; these sources are analyzed and examined in light of what they say about Anne, their bias, and their reasoning. Upon evaluation of the sources, a proto-Protestant Anne emerges: a woman who was evangelical and leaning toward Protestantism but had not given up all of her Catholic beliefs and practices yet. Like her daughter, Elizabeth I, Anne's religious views are somewhere in the middle; perhaps Elizabeth managed to channel Anne and her views in Elizabeth's own reign.

"The Hunger Connection: Towards a Diasporically Imagined Transnational Community"

Presenter(s): Nickell, Amber

Faculty Sponsor(s): Clinefelter, Joan

Graduate Presentation

03:40 - 03:55 in the Afternoon - Room: Spruce C

Throughout the 20th century notions of diaspora continued to expand and evolve as diasporic groups became increasingly deterritorialized, homelands were reclaimed and lost, and diasporic members grappled with two or more-often competing-national, racial, or ethnic identifications. Triggered by historical forces in their new and old homelands, diasporic groups frequently formed humanitarian relief and ethnic organizations to help navigate the social, political, and cultural terrain in foreign spaces and assist with the diasporization process.

Using the Germans from Russia (GR) as a case study, this paper examines a singular moment of mobilization from 1919-1922, in which American GRs organized to feed and clothe starving co-ethnics abroad. Tapping into American political structures the Volga Relief Society (VRS) joined forces with the American Relief Administration (ARA) to save the starving children of the Volga region, a majority of which were GRs. Throughout this process, American GRs forged ties with one another and GRs in the Soviet Union creating the foundation for a diasporically imagined transnational community.

Rocks in the Sea: Understanding the Senkaku/Diaoyu dispute in the East China Sea

Presenter(s): Siegel, Matthew

Faculty Sponsor(s): Fong, Adam

Undergraduate Presentation

03:00 - 03:15 in the Afternoon - Room: Columbine B

This paper analytically and historically examines the causes and various factors affecting the disputes between Japan and China over the island chain in the East China Sea, called the Senkaku in Japan and Diaoyu in China. Since the 1960's China and Japan have been locked in a territorial dispute over these islands, both due to nationalistic demands and due to the large amount of under water natural resources in the area. Drawing upon government documents, recent scholarship from China, Japan, and the United States and the writings of ordinary citizens this paper argues that combination of World War II, Chinese Civil War, and the Cold War have created an situation where conventional understandings of international law fail to create a clear title of ownership. The potential for the worlds second(China) and third(Japan) largest economies to go to war because of a territorial dispute is simply to great to ignore. This paper contributes to the scholarly discussions about the application and limits of international maritime law, nationalism and borders, and the importance of nuanced and comprehensive resolution of conflict.

The Significance and Lasting Impacts of History and Memory

Presenter(s): Fischer, Fritz; Gallegos, Megan; Wersch, Jared; Boone, Melinda; Volzke, Owen

Faculty Sponsor(s): Fischer, Fritz

Undergraduate Presentation

02:20 - 03:35 in the Afternoon - Room: Columbine A

Multiple Session Presentation - Sessions 15, 16, 17, 18

The Significance and Lasting Impacts of History and Memory

Authors: Melina Boone, Megan Gallegos, Owen Volzke, and Jared Wersch

The intent of this panel and the research presented is to examine how varying interpretations of historic events and trends reveal the influence of memory versus the actuality of the event itself. The conflict or conjunction of the historical and the memorial offers a textured understanding of not only why a society remembers an event in a particular manner, but furthermore how historical interpretation and memorial themes are capable of generating great deal of power and societal influence. Melinda Boone examines how Germans after World War II confronted their history of Nazism through sports, specifically soccer, by examining newspaper articles and magazines from the time. Owen Volzke looks at how historical and memorial interpretations influenced Oglala protestors at Wounded Knee in 1973 and their desire to create a distinct identity rooted in their understanding of Lakota tradition and United States abuse. Jared Wersch researches the changing societal interpretations of the Battle of the Alamo, and how rejuvenation of the battles associated meaning and significance in recent years serves a purpose similar to its historical rallying cry. Finally, Megan Gallegos studies how the ever-changing memories of Ronald Reagan influence the political actions taken in our future, rendering what actually happened during Reagan's presidency politically insignificant. Although the four topics presented here cover a broad historical spectrum, the common current running through all the projects is the influence of history and memory. Understanding the impact of these two concepts provides an in-depth, and often times necessary insight into understanding how access to history and access to memory provide a corresponding access to agency and identity creation. These projects seek to flush out precisely such an influence and its historic impacts.

Virtue+Knowledge Is Power: Samurai and Society in Tokugawa Japan

Presenter(s): Medrano, Rick

Faculty Sponsor(s): Fong, Adam

Undergraduate Presentation

01:00 - 01:15 in the Afternoon - Room: Columbine B

This paper analytically and historically examines the everyday lives of Tokugawa samurai in 19th century Japan. Samurai were the leaders of society during this period and shaped expectations of correct behavior in civil life. Largely cut off from the outside world, Tokugawa society freely experimented with what was and was not acceptable to a "Japanese" society. However, by the nineteenth century, the idealized expectations set up by the Tokugawa shoguns and their followers failed to meet the realities and pressures of everyday life. Using the autobiography of a Tokugawa samurai, this paper argues that Japanese society continued to expect samurai to follow the path of Neo-Confucian virtues, to serve as role-models and benefactors for the other classes of society, and to constantly acquire and utilize knowledge to benefit society. The contrast between the elevated expectations for samurai and the harsh demands of everyday life during the nineteenth century directly affected Japan's relations with the outside world and its attitudes towards social change and modernization. This paper contributes to historical knowledge of Tokugawa Japan, the influence of Neo-Confucianism on Japanese society and the changing roles of samurai in society.

Wang Yangming and Zhu Xi: Changing Neo-Confucianism in Ming Dynasty China

Presenter(s): Severson, David

Faculty Sponsor(s): Fong, Adam

Undergraduate Presentation

11:20 - 11:35 in the Morning - Room: Columbine B

This paper will analytically and historically examine counter-cultural changes to Neo-Confucianism in China during the Ming dynasty (1368-1644). As a political, legislative, and social movement, Neo-Confucianism profoundly influenced over 700 years of history, and went through many changes in both theory and practice. Using primary source writings from the two most influential philosophers during the Ming period--Zhu Xi and Wang Yangming--this paper argues that Wang Yangming provides a paradigm shift to contemporary Neo-Confucian thought, by de-emphasizing Zhu Xi's interpretations of Neo-Confucian canon, and provides a stark ideological contrast to the established dogma by directing moral cultivation inwards through the idea of innate knowledge. Wang Yangming's philosophy, while it never becomes canon for the Ming government, establishes an important precedent for further generations of thought to question the authority of government in further dynasties. This paper contributes to scholarly debates about the intellectual history of China, Neo-Confucian influence on society, and the common perception of religious/philosophical movements in China.

Interdisciplinary Studies

Ottoman Empire Presentations

Presenter(s): Junne, George and students

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

09:00 - 10:35 in the morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

Ottoman Empire Presentations: Black Eunuchs of the Ottoman Empire

Presenter(s): Smithey, Kasi

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

09:40 - 09:55 in the morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

Humans have long since used slaves as a means of making their lives easier, from agricultural purposes to household purposes all over the world; the Ottoman Empire is no exception when it comes to this. Eunuchs have been considered a third type of sexuality because of their lack of genitalia and in some cases are considered an abomination. Their most important role to the Empire was to serve and guard the women in the Harem, which were more or less the enslaved women's quarters.

Since they lacked the proper anatomy for a "real" man, eunuchs were able to move freely from the women's quarters to other areas in the Palace, unlike the other males. The duties they had did not stop there, however. They were in charge of the finances and were in charge of communication between the palace and the outside world. They were the ear to the sultan and made sure the subjects of the Empire were content with their ruler.

At the end of the Ottoman Empire, almost all of the eunuchs were black, including the Chief Black Eunuch. He was in charge of the other eunuchs and servants in the Harem and also had power and influence over political issues. Though not much research has been done on the Chief Black Eunuchs, this paper's purpose is to further investigate the roles and responsibilities they had during the Ottoman Empire.

Ottoman Empire Presentations: Class Stratification in the Ottoman Empire, From a Sociological Perspective

Presenter(s): Fine, Carrina

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

10:00 - 10:15 in the morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

There were definite class divisions among people of the Ottoman Empire. There was the obvious distinction between people within the palace and outside the palace, for instance. At the top were the Sultan and other royalty, including the Eunuchs and the Queen Mother. These few prestigious people held the most power. The military was ranked below them, along with government officials and other religious leaders. On the next lower level there were people outside of the palace, such as merchants, guild members, and traders. On the very bottom were peasants. Religion also determined a person's status. Muslims held the most prestige, then Christians and lastly, Jews. The four factors that determined a person's status in the Ottoman Empire were their career status, wealth, religion and gender. Since so few held so much power, there is a lot of class stratification within the Empire, with few people controlling who did or did not have access to power or the means to gain power. While this is inequality, it was necessary for the Sultan to maintain control over his empire.

Ottoman Empire Presentations: Dervish Mystics and Their Role in the Ottoman Empire

Presenter(s): Blackwood, Samuel

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

09:00 - 09:15 in the Morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

The purpose of this project is to examine what purpose the Dervish mystics had in the expansion of the Ottoman empire as well as their building of institutions such as caravansaries throughout the empire. These Islamic mystics were present during the early days of the Ottoman empire, and several Dervish orders later emerged, such as the Bektasi who later became integrated with the Janissary Corps. Although mysticism is frowned upon in the Muslim world, the Dervishes were able to accomplish most of their goals with relative ease. This research will outline how the presence of Dervishes helped or hindered the Ottomans in their mutual struggles.

Ottoman Empire Presentations: The Hierarchy of Women within the Ottoman Empire

Presenter(s): Contino, Nissy

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

09:00 - 09:15 in the Morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

The purpose of this study and research is to explain or better understand the hierarchy of women within the Ottoman Empire, and more specifically, the Harem in the Topkapi Palace. The first part of my presentation will describe the pyramid like scale on which I will be comparing the women in the Harem based on the politics of the Empire. I will continue to go into depth about what the Harem is so readers will be able to know what type of women I am exploring. The first woman discussed will be the Sultan's mother. Her role is significant when it comes to the history of the Ottomans. The second section of my presentation will discuss the wives of the Sultan. They play a vital role with the mother of the sultan and have an important part in the economic system of the Empire. The third section of my presentation will talk about concubines and servants of the Sultan and how they are ranked in this society. Lastly, my presentation will discuss how these women relate as a whole to the Empire by incorporating the importance of respect for women in the Palace, to the significance these women bring to create the powerful system of rulers the Ottomans are known for. This research will allow for a better understanding of the time period in which we are dealing with as well as the treatment and respect for high power women, like those in the Harem.

Ottoman Empire Presentations: Mehmed the Conqueror and His Role in the Expansion of the Ottoman Empire

Presenter(s): Lacey, Chance

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

09:20 - 09:35 in the Morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

Mehmed II is known as one of the most important people in the history of the Ottoman Empire. At such a young age, he helped to expand the Empire more than any other Sultan in history. Leading such a diverse group of people demanded a dominant and aggressive mindset and leadership style that is almost unimaginable for a twenty-one year old, which is another aspect of his impressive reign. The Ottoman Empire would not have been as expansive or impressive, for that matter, if it were not for the key role that Mehmed II played in the Empire's history.

Ottoman Empire Presentations: The Ottoman Medical Practices and Procedures

Presenter(s): Dill, Brady

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

09:00 - 09:15 in the Morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

This project involves the importance and the discovery of tools & methods used in the medical practices and procedures in the Ottoman Empire. The goal is to show how the Ottoman Empire discovered remedies to cure illnesses and injuries, and identifying exactly how important these medical procedures were. This has been done by examining specific events such as the procedures and methods used to conduct abortions for women in the Empire. Upon examining this and several other events in time, it becomes clear that the discovery and the importance of the medical practices performed by the Ottomans played a huge role in the Empire. This research highlights the importance and the discovery of the tools and methods used in medical practices in shaping the Ottoman Empire.

Ottoman Empire Presentations: Religious Peace within the Ottoman Empire

Presenter(s): Smith, Austen

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

09:20 - 09:35 in the Morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

The purpose of this research is to identify the strategies used by the Ottoman government to maintain civil rest amongst a varying range of ethnic and religious backgrounds. The Ottoman Empire consisted of Muslims, Christians, and Jews, and all groups were compelled to live in harmony. The first step in researching this topic was to find scholarly sources regarding the political and moral actions taken by the Ottoman hierarchy in keeping control over the masses. Secondly, I apply these policies to actual situations to demonstrate their working ability. By discovering just how the Ottomans were able to be peaceful in a delicate civil situation, perhaps we can better understand how to be peaceful in the modern world of politics.

Ottoman Empire Presentations: The Role of the Ottoman Navy in the Expansion of the Empire

Presenter(s): Lloyd, Ryan

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

10:00 - 10:15 in the morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

Despite the vast amount of recent research by many on the Ottoman Empire, many American students remain uneducated about the once-powerful sultanate. The rapid expansion of the Ottoman Empire was achieved through several ambitious minds ranging from the Sultans to the military and its commanding officers. A great amount of success can be attributed to the Ottoman naval fleet and an outstanding commander, "Barbarossa" Hayreddin Pasha. The average college student knows very little about the Ottomans and only vaguely about the Empire's naval fleet, or Barbarossa specifically. This study reveals the power that was once held by the Ottoman Empire, facilitated through the innovative and cunning mind of "Barbarossa." Data for this research is derived from books, journal articles and other available resources on Turkish and Ottoman history and will contribute to future research.

Ottoman Empire Presentations: The Sociology of Eunuchs within the Ottoman Empire

Presenter(s): Miller, Hannah

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

09:40 - 09:55 in the morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

Before the dawning of the nineteenth century, the country that is now modern-day Turkey was under the subject of the Ottoman Empire. For all of its advancements in technology and cultural differences, this vast realm had several unique characteristics that made it stand out against those that survived during the same time period. The most fascinating of these was that of the eunuchs. Considered neither male nor female, these castrated men able to achieve incredible status due to the mutilation preformed upon their body and their inherent "trust worthiness" around women. This procedure would have been unthinkable traumatizing to the victim and such a procedure would inevitably alter the man's life forever. Though thoroughly accepted by the society at the time, my question was what were the implications of such a procedure upon the victims themselves? Was there residual anger despite the possibility to become one of the emperor's closest companions? In order to figure this out, I will be researching the Eunuchs of the Ottoman Empire as a whole, as well as the societal implications that would accompany such a procedure. I will also be delving into the biographies of several well-known Eunuchs and researching how they were treated by the society at the time.

Ottoman Empire Presentations: Spectator Sports of the Byzantine Empire

Presenter(s): Zuehlke, Ethan

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

10:20 - 10:35 in the morning - Room: Columbine A

The major portion of my research involves spectator sports of the Byzantine Empire. Many of the spectator sports at this time displayed skills in horsemanship. Polo and chariot races were the most popular. Games were held in what is called the hippodrome, and the racers were divided into four factions, red, blue, green, and white. Fans would root for racers of certain factions simply for the sake of picking sides. In the early years gladiator and man versus beast exhibitions were also displayed but they soon gave way for chariot racing. In between races spectacles of wire walking, dancing, and wild beasts would entertain the crowd until the next race began. Riots were common during the games. Different faction followers would dispute over their racers and this often times ended in large riots between the people.

Ottoman Empire Presentations: The Valide Sultans of the Ottoman Empire

Presenter(s): Hutchinson, Bria

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

09:20 - 09:35 in the morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

The purpose of this research is to examine the extent to which all of the valide sultans during the Sultanate of Women period exerted their power and influence on their sons, the sultans. This can show scholars the difference in ruling styles between the men and women at that time and also how it impacted the Empire, its spheres of influence, and eventually, all other nations with which the Empire communicated or had any sort of relationship with. To discover the extent of the valide sultans' power exertion, many articles, books, journals, and research papers were read and analyzed. The findings are that the exertion of power by the valide sultans during this specific period let them basically have indirect rule over the entire Ottoman Empire. This has a big impact, not only on the history of the Ottoman Empire, but on the entire history of the world. It lets historians know that

when men seem to be leading, women could have significant roles in the political, economic, and societal decisions of the nation. It begs the question, how many other nations in different points in time were significantly influenced by all kinds of women?

Ottoman Empire Presentations: Women and the Ottoman Economy

Presenter(s): Montano, Ashley

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

10:00-10:15 in the morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

The purpose of this research is to reveal how women were contributing to the Ottoman economy by holding powerful positions in the Empire. Many women were free and strong and had rights that enabled them to run their families and their own businesses. It is said that the men controlled the Empire, but many women controlled the men. Evidence reveals that some women were behind the curtain (both literally and figuratively) providing input as to how the Empire ran. They were not all stay-at-home moms; they worked jobs, sold goods, or worked at a family business. These women not only contributed financially to the economy, but also worked to support their families financially. Women could be a force to be reckoned with as working mothers, supervising endowments that built mosques and fountains, and being entrepreneurs.

Ottoman Empire Presentations: Women Concubines of Sultans of the Ottoman Empire

Presenter(s): White, Josiah

Faculty Sponsor(s): Junne, George

Undergraduate Presentation

09:40 - 09:55 in the morning - Room: Columbine A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5

My research will focus on the lifestyles, psychology, and the socioeconomic positions of women concubines of the Sultans during the Ottoman Empire. For this research project I will be reviewing published works in books, doctoral dissertations and online articles, as well as academic journal articles. Aspects that I explore in my research include the origins of these women, how they became concubines and their various roles in the Sultans' harems. It will also reveal the women's varied social and economic status they held and consequences of dissent. This project aims to explore the identity of women as concubine's during the Ottoman Empire.

Refugee Community in Greeley - A Community Asset Mapping Project

Presenter(s): Wycaver, Sarah; Anderson, Kirstin; Bugarin Correa, Arturo; Eickelman, Kelsey; Hatton, Conner; Jones, Amanda; Kropp, Kacey; Krumtum, Alexandra; McCully, Savannah; Metcalfe, Mackenzie; Morris, Savannah; Scharf, Emilie; Williams, Kelsy; Crow, Loree

Faculty Sponsor(s): Crow, Loree

Undergraduate Presentation

11:00 - 11:55 in the Morning - Room: Columbine A

Multiple Session Presentation - Sessions 7, 8, 9

As part of HON200 Honors Connection Seminar II: Global Citizenship in Your Neighborhood, students explored their local community in Greeley, Colorado and created a community asset map for the Global Refugee Center based on Asset Based Community Development principles (Kretzmann and McKnight, 2003). The students who conducted the asset mapping project will present their findings in this session and will be identifying several asset areas that can be launching points for future community development.

Mathematics

Square-Free Sequences on Small Symbol Sets

Presenter(s): Myrant, Catrina

Faculty Sponsor(s): Levin, Oscar

Undergraduate Presentation

03:20 - 03:35 in the Afternoon - Room: Spruce B

A square-free sequence is a string of symbols that does not contain two adjacent copies of the same substring. The more symbols that are allowed in the sequence, the easier it is to make the sequence square-free. In this talk we will discuss different methods of making long, square-free sequences even though few symbols are used.

Mexican American Studies

Immigration Debate and Public Policy

Presenter(s): Serrano, Nereida; Garcia, Erik; Soto-Marquez, Jose; Mejia, Carla; Perez, Jesus; Correa, Michael; Roman-Luevanos, Blanca

Faculty Sponsor(s): Falcon, Priscilla

Undergraduate Presentation

10:20 - 10:55 in the Morning - Room: Spruce B

Multiple Session Presentation - Sessions 5, 6

The United States is the world's leader by far as a destination for immigrants. The country with the next largest number of immigrants is Russia with 12.3 million. The U.S. total of 40.4 million which includes legal as well as unauthorized immigrants represents 13% of the total U.S. population. Research papers will be presented in the panel which address issues such as, trends in both legal and authorized immigration, children and families, workplace raids, mixed-family status, immigration priorities, deferred action policies, and deportation policies.

Latinos and Public Policy

Presenter(s): Sugi, Teresa; Flores, David; Janssen, Kathrine; Swazo, Christopher; Antuna, Donilia; Leal, Erendira

Faculty Sponsor(s): Falcon, Priscilla

Undergraduate Presentation

11:20 - 11:55 in the Morning - Room: Spruce C

Multiple Session Presentation - Sessions 8, 9

The 2010 census revealed that over the previous decade, Latinos were the fastest growing population in Colorado, accounting for 41.2% of Colorado's growth since the 2000 Census. Colorado was one of eight states with a Latino population of 1 million or more other states being Arizona, California, Florida, Illinois, New Jersey, New York, and Texas. The focus of these presentation will address Latinos and the new role they are playing in politics, including the last presidential election.

Nutrition

Effects of Testosterone-Boosting Supplements on Body Composition, Serum Hormones, and Muscle Mass and Strength in Male Recreational Weightlifters

Presenter(s): Van Wagenen, Jennifer

Faculty Sponsor(s): Gould, Susan

Undergraduate Presentation

02:20 - 02:35 in the Afternoon - Room: Spruce A

To achieve the best performance possible, some athletes turn to ergogenic aids such as those that claim to increase muscle hypertrophy. The quality and purity of ingredients and the ingredients themselves are often questionable at best. T-Boosters have become extremely popular, especially among male weightlifters and bodybuilders looking to increase muscle mass. Current literature will be reviewed including how they work and studies testing the effects on strength and body composition in rugby players, serum profiles in resistance-trained eugonadal males, and regulatory elements in resistance exercise and training. These studies do not seem to support use; however, some factors that were not considered will be discussed.

Physics

Using Optical Tweezers to Investigate the Escherichia coli Molecular Motor

Presenter(s): Champion, Steven; Day, Travis; Jordan, Connor

Faculty Sponsor(s): Sung, Ruwang

Undergraduate Presentation

10:40 - 10:55 in the Morning - Room: Columbine A

An optical trap or "optical tweezers" uses the force of laser radiation to manipulate biological and colloidal material in a non-contact manner. The piconewton sized forces provided by optical traps make them optimal for investigating the mechanical output of biological molecular motors. This study used an optical trap to examine the properties of the Escherichia coli (E. coli) flagella motor. In particular, the rotation frequency and stall torque of the KAF95 strain of E. coli were measured. This strain was chosen because it is nonpathogenic, exhibits only clockwise rotation, and has sticky flagella that easily attach to glass. A weak trap (about 7 mW of laser power) was used to determine the bacterium's rotation frequency. The stall torque was measured in a

strong trap (about 120 mW) by identifying the minimum power required to stop the motor's rotation. The physics and design of the optical trap, position and trap stiffness calibration procedures, and experimental results will also be discussed.

Psychology

Judging Sexual Orientation from Still Faces

Presenter(s): Archuleta, Aly; Morrison, Katey

Faculty Sponsor(s): Peterson, Eric

Research Excellence Award Finalist

Undergraduate Presentation

09:40 - 09:55 in the Morning - Room: Council Room

A burgeoning literature demonstrates that individuals can judge personality and group membership (e.g., religious and political affiliation) from still faces with some degree of accuracy. Recent studies demonstrate that individuals perceive sexual orientation better-than-chance from surprisingly impoverished facial stimuli. This effect remains even when the stimuli consist of only the eye region (i.e., cut out from the face) and are presented at just 50 milliseconds. To date, researchers have explored possible physiological markers (i.e., increased pupillary dilation) that may convey information about orientation. However, it remains unclear what aspects of the facial stimuli the perceiver utilizes to form a judgment. An important limitation of past studies concerns the creation of stimuli. Researchers have obtained pictures (i.e., faces of gay and straight individuals) from online dating websites. In the present study, we are recruiting volunteers who confidentially self-report sexual orientation information and allow us to take a face pic. After grouping our stimuli by sexual orientation, we will use morphing technology to create composite stimuli representing each group. The composites will provide a more robust means of exploring two feasible hypotheses: 1) the faces or eyes of individuals of homosexual orientation differ in a systematic way (e.g., pupillary dilation), or 2) individuals of homosexual orientation may display facial characteristics that are more likely to diverge from an "average" face in a non-systematic way. In the first scenario, any discerning featural traits should intensify in the composite faces. In the second scenario, sexual orientation discrimination should dissipate in the morphing process. We believe our results will inform our understanding of the social cognitive mechanisms that support a person's ability to make orientation judgments based on minimal information. Further, we may gain some insights that direct future research in the development of sexual orientation.

Somali Refugee Interpretations of trauma-related Mental Illness: Similarities and Differences between the Somali concepts of 'Murugo Joogto' and 'Qulub' and PTSD

Presenter(s): Miller, Caitlin

Faculty Sponsor(s): Bashore, Theodore

Research Excellence Award Finalist

Undergraduate Presentation

11:40 - 11:55 in the Morning - Room: Council Room

There has been growing interest in studying the psychological impact of trauma on refugees, but studies that combine quantitative psychological methods with qualitative anthropological methods to determine cultural influences on the psychological expression of this trauma are rare. Although post-traumatic stress disorder (PTSD) has been studied extensively since the Vietnam war, most of the studies have excluded the impact of culture on the definition, experience, and manifestation of trauma. In this investigation, Somali refugees were studied to identify their cultural interpretation of psychological reactions to traumatic experiences. Specifically, this research is directed at understanding two culturally-identified disorders, Murugo Joogto and Qulub, from the Somali perspective and comparing them to PTSD. Somali refugees took part in a semi-structured interview in which questions were directed at determining how they experience these two disorders and then completed the PC-PTSD questionnaire in verbal format and the DSM IV-TR to determine their similarities and differences. An important goal of this work is to provide data important to the proper diagnosis and treatment of Somali victims of trauma. The predicted outcome of this research lies within the identification that diagnosing Somali refugees with PTSD damages their psychological health further by introducing the factor of community ostracization. The findings will clarify that although symptoms of Murugo Joogto and Qulub are similar to PTSD, the way they Somali people identify with the mental health experience will express itself as an avoidance of being labeled by their community but rather identification with either Murugo Joogto or Qulub.

Public Health

Master of Public Health Graduate Student Capstone Presentations

Presenter(s): Sharp, Teresa; Groesbeck, Corrie

Faculty Sponsor(s): Sharp, Teresa

Graduate Presentation

09:00 - 10:55 in the Morning - Room: Aspen A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5, 6

Strengthening the regional food system in Weld County Colorado is important for improving healthy food access to the county's populations with a focus on school children. Healthy Weld 2020 (HW2020), a program based out of the Weld County Department of Public Health and Environment (WCDPHE), has been focused on the development of a partner-based food system that will improve community access to locally grown foods and have a positive economic, social and physical impact on the population.

Purpose: The purpose of this project was to develop a food safety handbook as a training manual for local food producers. The intent of this manual is to guide producers in developing food safety plans describing the Good Agricultural Practices (GAP) they have in place to ensure food safety. Methods: Information on producer market participation was collected through a survey at the Colorado Farm Show as well as through the Food Hub Advisory Panel hosted at WCDPHE. Results: This project has shown that developing a food hub and producer food safety handbook is much more challenging than expected. The project is more detailed than anticipated. HW2020 is working to create a tri-agency collaboration that will make partnership and logistics much more feasible. Additional efforts and funding are required to complete this project. Conclusions: This development plan has determined the necessity for HW2020 to gain producer trust. It has also shown the need to educate both producers and buyers on communication barriers that need to be overcome. Additional grant funding will be necessary for continued progress in food system development.

Master of Public Health Graduate Student Capstone Presentations: Advocating for Equity Around Active Transportation in the Regional Transportation Funding Process

Presenter(s): Ford, Shelly; Groesbeck, Corrie; Sharp, Teresa; Sheppard, Shannon; Skenadore, Amanda; Carroll, Danya; Madsen, Matthew

Faculty Sponsor(s): Sharp, Teresa

Graduate Presentation

10:40 - 10:55 in the Morning - Room: Aspen A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5, 6

Transportation funding becomes an issue of health equity in communities that currently lack the infrastructure to support people who walk or bike for transportation. Walking and biking are utilized more as transportation by lower-income residents than others in the community. When a community lacks the infrastructure to support low-income residents, transportation planning becomes an equity issue. The goal of this project is to bring awareness to the current funding process while offering suggestions to reduce inequities. The Denver Regional Council on Governments (DRCOG) is the Metropolitan Planning Organization responsible for transportation projects in the Denver Metro area. By utilizing qualitative interviews with planners and policy makers as well as comparing data from the Colorado Department of Public Health, this project assessed the current allocation of transportation funding for bike and pedestrian projects in the Denver Metro area. Regional funding levels are compared to the number of people who are using bicycle and pedestrian transportation by reviewing data from the Regional Household Travel Survey. The expected result is that the number of cyclists/pedestrians is higher than the current DRCOG funding for those transportation projects in the Denver Metro area. A tool will be developed for community organizations to use in advocating for increased transportation funding. This tool will highlight the three transportation funding processes of DRCOG and provide suggestions for becoming involved in the advocacy process. Finally, Nashville and Portland have good funding processes and will be reviewed for suggestions to improve the funding scoring process in Denver. A presentation will be developed including suggestions that will be presented to employees and members of DRCOG to improve the equity associated with transportation funding.

Master of Public Health Graduate Student Capstone Presentations: American Indian Youth Perspectives on Traditional Food Systems

Presenter(s): Carroll, Danya

Faculty Sponsor(s): Sharp, Teresa

Research Excellence Award Finalist

Graduate Presentation

10:20 - 10:35 in the Morning - Room: Aspen A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5, 6

01:40 - 01:55 in the Afternoon - Room: Council Room

American Indian (AI) communities are disproportionately affected by obesity and comorbidities compared to other populations. Obesity is a major health concern for AI youth, many of whom are obese or overweight before age ten. The obesity epidemic among AI youth is a result of complex social determinants including built environment, food deserts, and low socioeconomic status. AI communities have undergone a nutritional shift in which traditional, natural foods are not relied on as heavily as they were in the past. **OBJECTIVE:** To collect information on the social and environmental factors and barriers youth perceive in accessing healthy traditional foods. **METHODS:** Qualitative data was collected using a community-based participatory research needs assessment approach through focus groups with AI youth on the Fort Apache Indian Reservation in northeastern Arizona. After Tribal Council approval, focus group participants were recruited through social media, flyers, and word-of-mouth. The focus groups were conducted by age (12-14 yo, 15-17 yo, & 18-20 yo) to enhance discussion. **RESULTS:** Social and environmental barriers influencing youth perspectives on traditional foods included, 1) limited variety and supply of healthy local foods (food desert), 2) few choices for healthy restaurants and stores, 3) lack of quality foods including fresh fruits and vegetables, and 4) lack of food safety and environmental health were barriers for accessing food. Social barriers included a lack of generational knowledge of traditional foods, substance abuse, and low-income level. Suggestions for improving local food systems included lowering healthy food prices, increasing options, and having more locally-grown food (food sovereignty). **CONCLUSION:** We gained valuable insight into social and environmental barriers that youth perceive in accessing healthy traditional foods. These discussions provide direction for future obesity and diabetes prevention programs for AI youth. Data also indicate a need for more culturally appropriate nutrition programs to provide AI youth with healthy foundations.

Master of Public Health Graduate Student Capstone Presentations: Efforts to Increase College Recruitment of American Indian/Alaska Native youth for Public Health Careers

Presenter(s): Ford, Shelly; Groesbeck, Corrie; Sharp, Teresa; Sheppard, Shannon; Skenadore, Amanda; Carroll, Danya; Madsen, Matthew

Faculty Sponsor(s): Sharp, Teresa

Graduate Presentation

10:00 - 10:15 in the Morning - Room: Aspen A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5, 6

High School dropout rates on American Indian/Alaska Native (AI/AN) reservations are very high, resulting in a low number of AI/AN high school students who pursue admittance into Colleges/Universities. Nationally, more students of other races attend any level of college compared to AI/AN students. This creates communities that lack educated professionals. In addition to low education rates, AI/AN populations are disparate with poverty, alcoholism, and diabetes. All of these factors contribute to worsening health conditions of the AI/AN population. The American Indian community is in need of public health professionals. There is limited representation of AI/AN individuals in health professions. Within the Indian Health Service, there is low staff retention/ high staff vacancy rates and the recruitment of staff to live on the reservation is very low. By becoming health professionals, youth can help combat health disparities on their reservations, and be vital contributors to the improvement of the health of their people. The purpose of this capstone project is to establish and increase the interest in careers in Public Health among local AI/AN youth. This project strives to reach the AI/AN students at an early age to help prepare them for higher education. Denver area AI/AN youth were introduced to public health education/careers through access to successful health professionals, a college visit, and a faculty panel representing Schools of Public Health. A pre and post survey was administered at the beginning and end of the School of Public Health panel and it measured the students' knowledge and interest of what they learned. In addition two focus group meetings were transcribed and coded to measure students' responses regarding higher education in Indian country.

Master of Public Health Graduate Student Capstone Presentations: Impact of an after school wellness program on healthy lifestyle knowledge in middle school students

Presenter(s): Ford, Shelly; Groesbeck, Corrie; Sharp, Teresa; Sheppard, Shannon; Skenadore, Amanda; Carroll, Danya; Madsen, Matthew

Faculty Sponsor(s): Sharp, Teresa

Graduate Presentation

09:20 - 09:35 in the Morning - Room: Aspen A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5, 6

Many students receive very little health education in school. While requirements vary from state to state, district to district and even school to school, many middle school students in Colorado are only required to take one trimester or semester of health education. Many students do not know the importance of healthy lifestyle choices. Some school have eliminated after school sports which has caused a dramatic decrease in physical activity participation by middle school students. Therefore, the purpose of this project was to determine if an after school wellness program that incorporates hands-on healthy lifestyle education activities would increase students' knowledge of the importance of maintaining a healthy lifestyle as well as increase physical activity. Participants included 23 students ages 11 through 14 enrolled in the Adams 12 School District. Students participated in an 8-week program that included two 1 ½ hour physical activity sessions each week and one 1 ½ hour healthy cooking class each week. Students were taught information through activities, cooking, group discussions, and guest speakers. Students completed pre- and post-surveys to assess change in healthy lifestyle knowledge based upon information provided in the program.

Responses indicated a growth in knowledge as well as rates of physical activity and amount of cooking done at home. This program showed that middle school students can increase health knowledge through engagement in after school program when it involves fun, engaging material and people.

Master of Public Health Graduate Student Capstone Presentations: Unveiling barriers for Community Based Organizations supporting sexual education curriculum in Metro Denver schools

Presenter(s): Ford, Shelly; Groesbeck, Corrie; Sharp, Teresa; Sheppard, Shannon; Skenadore, Amanda; Carroll, Danya; Madsen, Matthew

Faculty Sponsor(s): Sharp, Teresa

Graduate Presentation

09:40- 09:55 in the Morning - Room: Aspen A

Multiple Session Presentation - Sessions 1, 2, 3, 4, 5, 6

Youth are disproportionately impacted by Sexually Transmitted Infections (STIs) and the numbers are continuing to rise. There is a need to provide more comprehensive sexual education programs for all youth in Denver. Currently in Colorado there are no laws mandating the implementation of sexual education curriculum. It is up to individual school districts whether or not to adopt sexual education programs. The state policy on sexual education requires that if a school is to provide programming then it must be comprehensive. However, there is no monitoring or evaluations of these programs that are implemented in either schools or local communities, and there are varied approaches to sexual education curriculum that may or may not be comprehensive. There is a need to support school districts and communities with training, implementation, and evaluation of sexual education programs. There are outside agencies such as Community Based Organizations (CBOs) that specifically provide sexual education programs to offer these resources. Without these additional resources, some school districts or community based programs have difficulty implementing sexual education programs because there is not continuity of information. Through qualitative interviews a report was created in order to obtain a snapshot of Denver CBOs efforts to deliver and support sexual education programs in schools and communities. The report highlighted how CBOs are successful in their programming and what barriers they encountered. The data was analyzed by finding trends and differences, and these findings were shared within each Denver based CBO

Physical Activity and Preventive Health Behaviors in a National Sample of College Students

Presenter(s): Groesbeck, Corrie; Schroeder, Emily

Faculty Sponsor(s): Brittain, Danielle; Dinger, Mary

Research Excellence Award Finalist

Graduate Presentation

02:00 - 02:15 in the Afternoon - Room: Council Room

Physical activity (PA) is one preventive health behavior for promoting wellness among college students. Only minimal research has examined whether college students who participate in PA are more likely to engage in other preventive health behaviors. Purpose: The study purpose was to examine differences in: (1) PA and preventive health behaviors between women and men and (2) preventive health behaviors between college students meeting and not meeting weekly PA recommendations (i.e., = 75 minutes of vigorous, = 150 minutes of moderate, or = 150 minutes of moderate/vigorous). Methods: The National College Health Assessment was distributed to students at 157 campuses in the United States during the 2008-2009 academic year. Participants (n = 67,321) were categorized as either meeting or not meeting the PA recommendations and either participating or not participating in other preventive health behaviors (i.e., dental exams/cleaning, sunscreen use, HIV testing, testicular or breast self-exams and gynecological exams). Descriptive statistics and Pearson chi-square analyses were used to examine gender differences in preventive health behaviors and differences in preventive health behaviors between students meeting and not meeting PA recommendations. Results: While males (n = 22,129, 32.9%) were more likely to meet PA recommendations (p < 0.0001), females (n = 45,192, 67.1%) were more likely to participate in dental exams/cleaning, sunscreen use, and HIV testing (p < 0.0001). Students who met PA recommendations were more likely to engage in dental exams/cleanings, sunscreen use and HIV testing than those not meeting the recommendations. Men meeting PA recommendations were more likely to do a testicular self-exam (p < 0.0001) and women meeting PA recommendations were more likely to have a gynecological exam and do a breast self-exam (p < 0.0001) than those who were insufficiently active. Conclusions: Preventive health behaviors are more likely to be practiced among college students who meet PA recommendations.

Sociology

An Alternative Approach to the Feminine Apologetic: Does the Situation Dictate Whose Expectations Matter?

Presenter(s): Shuey, Mark

Faculty Sponsor(s): Henderson, Angela

Graduate Presentation

11:00 - 11:15 in the Morning - Room: Columbine B

Prior sociological research on the feminine apologetic has focused on how female athletes enhance their feminine traits in an attempt to apologize for their participation in sports. This study attempted to delve into the diverse social complexities a female athlete must navigate on a daily basis as they internally negotiate an identity that would be socially accredited. To thoroughly examine this social dilemma facing female athletes, the researchers utilized the Situational Feminine Apologetic Scale created by Shuey, Henderson, and Schneider (2013) to measure how pressure to emphasize feminine traits differs across varying social milieu. The three contextual situations compared were while competing, during practice, and outside of athletics. In addition to contextual factors, group dynamics were scrutinized to determine how particular groups present (i.e., significant "others" or "strangers") influenced whether female athletes were pressured by first-order or second-order expectations. Results indicated that female athletes were more likely to fulfill a societally defined female "character" in situations where second-order expectations were present. Hence, the feminine apologetic was less a performance and was better described as fulfilling a "character" to ensure one was not socially discredited.

A quantitative survey was utilized for this research, and the data was analyzed using non-parametric t-tests (Wilcoxon Signed Rank tests).

Discovering the Illness of Eating Disorders

Presenter(s): Guy, Shawna; Ritterbush, Kaci; Sikes, Samantha

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

09:40 - 09:55 in the Morning - Room: Spruce C

The media's influence on both sexes has created a drastic increase in the number of people suffering from eating disorders. This mental illness is so powerful it makes people ignore a desire that is essential to their survival or drive them to extreme behaviors such as binge eating and purging. Society is the creator of the ideal human being, however there is no education about the risks associated with the extremes people will go to in order to achieve the ideal body. Eating disorders have extreme effect on both a person's physical and psychological well being.

Family Studies Research Projects

Presenter(s): Padilla, Krista; Pflock, Lexi; Gray, Jennifer

Faculty Sponsor(s): Moore, Mel

Undergraduate Presentation

10:00 - 11:15 in the Morning - Room: Spruce C

Multiple Session Presentation - Sessions 4, 5, 6, 7

Three original research projects related to family studies will be presented by undergraduate sociology majors. One project involves the analysis of secondary data from the American Community Survey, including measures of poverty, employment, income and household size, in order to determine whether the proportion of homelessness varies across four Front Range communities. Another project measures the effectiveness of Life Skills classes for United Way's RITE program, and the third study examines what motivates students to finish a GED course when they have been court-ordered to attend it.

Renaming of Assault Survivors Advocacy Program

Presenter(s): Jones, Kyle

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

03:20 - 03:35 in the Afternoon - Room: Columbine B

This is a mixed study, looking at incentives and disincentives of the Assault Survivors Advocacy Program (ASAP), which deters individuals from seeking services. The different levels of trauma will be examined including: social, institutional, and personal. Additionally, we examined the support systems and social disinterest and the correlation between the two. A mixed study consisting of a survey to gain perceptions of the program and then a focus group of 12-15 participants to gain a better understanding of students views of program language.

Society Behind Bar

Presenter(s): Renzelman, Renae; Cooper, Robert; Arent, Megan; Harder, Jessica

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

10:40 - 10:55 in the Morning - Room: Columbine B

Behind bars, what do you think is really happening? Especially for those suffering from mental disorders. This project will examine the sociology of mental illness from all perspectives both inside and outside of prison. These topics will be examined through the use of personal interviews, from a guard and a prisoner, as well as the use of humanistic research and archival statistics. Our purpose is to uncover the realities of the society inside the prison and its effect on inmates with mental illness. Likewise, we will examine how our society uses the prison system as a revolving door to turn a blind eye on sections of society--specifically those with mental illnesses. Our goal is to broaden our understanding on the role of mental illness within the prison system.

A Sociological Perspective Concerning Emotional Trauma and Post-Traumatic Stress Disorder

Presenter(s): Small, Bob; Holmes, Marissa; Matuszek, Kelsi

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

10:40 - 10:55 in the Morning - Room: Aspen C

The purpose of this research project is to explore various approaches and perspectives in which post-traumatic stress is addressed through gender, multi-generational, and cultural facets. By analyzing the different techniques which are used to determine the assessment and treatment of Post-Traumatic Stress disorder and other post-traumatic transformations, a comparison can be made to determine the effectiveness of assessment and treatment across cultural and societal boundaries. The research methodology used for this project consists of historical data as well as current research data which is currently being conducted through various research institutions using interviews, psychological assessments, and data collected through field studies. The conclusion from this project is how the significance of trauma to individuals, cultures, and societies is varied across different groups in which assessment and treatment is made particular to the specific values of the individual, culture, and society.

Spanish

La adaptación en tierras extranjeras

Presenter(s): Thayer, Corina; Soto-Marquez, Jose; Garcia, Karen; Ordonez-Ortega, Perla; Tavizon, Luis

Faculty Sponsor(s): Garza, Efrain

Undergraduate Presentation

01:00 - 01:15 in the Afternoon - Room: Aspen C

Como todo proceso personal y de grupo social, la adaptación a la vida en tierras extranjeras conlleva toda una serie de ajuste a las nuevas formas de vida. Entre estas barreras de reacomodo para el inmigrante se pueden mencionar el idioma, el folklore, las costumbres, la educación y las leyes que deben de ser del conocimiento de los nuevos inmigrantes. El proceso de aculturación es difícil, pero no imposible. Este reto es el gran obstáculo que difícilmente se logra vencer.

CADENCIAS 1: Estampas e impresiones

Presenter(s): Hilgenberg, Kacey; Budde, Jacob; Barker, Emily; Camacho, Adriana; Fish, Janelle

Faculty Sponsor(s): Gonzalez, Ester

Undergraduate Presentation

09:00 - 09:15 in the Morning - Room: Aspen C

These presentations are some of the compositions that will be published in the first issue of CADENCIAS. All of them were written for Fall Semester classes.

CADENCIAS is Hispanic Studies's student literary and arts magazine, starting June 2013. The Editorial Board selects student work to publish in an annual virtual magazine featuring poetry, prose, creative, non-fiction, photography, and traditional and digital art. Everybody taking classes in Hispanic Studies Department is encouraged to get involved.

CADENCIAS 2: Leyendo con cuidado

Presenter(s): Gray, Katherine; Nunez, Jose; Mohnssen, Ashley

Faculty Sponsor(s): Gonzalez, Ester

Undergraduate Presentation

03:40 - 03:55 in the Afternoon - Room: Spruce B

CADENCIAS is Hispanic Studies's student literary and arts magazine, starting June 2013. The Editorial Board selects student work to publish in an annual virtual magazine featuring poetry, prose, creative, non-fiction, photography, and traditional and digital art. Everybody taking classes in Hispanic Studies Department is encouraged to get involved. These three presentations are some of the term papers that will be published in the first issue of CADENCIAS.

El español de Colorado

Presenter(s): Camacho, Adriana; Castanaza, Gustavo

Faculty Sponsor(s): Ryan, John

Undergraduate Presentation

03:00 - 03:15 in the Afternoon - Room: Spruce A

This presentation (in Spanish) explores the variety of Spanish spoken in Colorado. It will demonstrate with maps differences in vocabulary, talk a little about the history behind this dialect, discuss its relationship to what is called "Border" Spanish, and conclude with some remarks about code-switching.

Emilia Pardo Bazán: El sueño de cambios sociales entre sexos

Presenter(s): Soto-Marquez, Jose

Faculty Sponsor(s): Garza, Efrain

Undergraduate Presentation

01:20 - 01:35 in the Afternoon - Room: Aspen C

Emilia Pardo Bazán es una de las escritoras feministas más destacadas de su época. Ella logró construir su reputación atacando al hombre, su historia, sus costumbres y su forma de pensar. Está bien entendido que en aquel entonces no se veía bien que la mujer fuera escritora, ni que estuviera educada. Según la tradición, la mujer pertenecía a la casa para cuidar los niños, mientras que el hombre se encargaba del mantenimiento. Pardo Bazán no estaba de acuerdo en esa forma de pensar. No temía al hombre o la sociedad. Su rencor al hombre se ve tanto en sus obras como en que ella no utilizó un nombre falso de hombre para escribir, como lo hacían otras mujeres que se atrevían a ser escritoras. Pero Emilia Pardo Bazán no fue feminista como la mayoría de los críticos lo han expresado. Ella no creía en la igualdad entre sexos. Esta presentación demuestra el rencor que Pardo Bazán le guardaba al hombre forzándola a escribir del fracaso que era el hombre y no de la igualdad entre hombres y mujeres. Los textos incluidos en este estudio comprenden Memorias de un solterón, "La novia fiel," "El encaje roto," "Cuento primitivo," "Feminista," "Champagne," "La boda" y "La punta del cigarro."

Historia de inmigrantes

Presenter(s): Acosta Martinez, Joselin; Jaquez, Mayra; Juarez, Keith; Ward, Patricia

Faculty Sponsor(s): Garza, Efrain

Undergraduate Presentation

09:20 - 09:35 in the Morning - Room: Spruce B

Las vicisitudes de las personas que emigran a otro país en busca de nuevas oportunidades da como resultado un fenómeno socio-político que afecta tanto al país del que emigran como a su nuevo país de residencia. No siempre se logran los efectos deseados que en la mayoría de los casos afecta enormemente a las familias envueltas en ese proceso y se refleja en la relación entre los países que se ven involucrados en la emigración-migración. Las historias incluidas en esta presentación nos darán una mejor idea de todo el entramado por el que pasan los inmigrantes.

La gramaticalización del progresivo: un estudio basado en el habla culta de Buenos Aires.

Presenter(s): Monzon, Gloria

Faculty Sponsor(s): Ryan, John

Graduate Presentation

03:40 - 03:55 in the Afternoon - Room: Columbine B

This presentation in Spanish shows how the Corpus of Spanish created by Mark Davies at Brigham Young University was used for a project on the grammaticalization of the progressive tense in Spanish. The presentation will include a discussion of the corpus, a demonstration of its use, a presentation of the data of the study, as well as its conclusions.

La opresión del libre albedrío por el abuso del amor

Presenter(s): Ennis, Amanda

Faculty Sponsor(s): Garza, Efrain

Undergraduate Presentation

10:00 - 10:15 in the Morning - Room: Spruce B

En relación con la literatura peninsular, la idea del "libre albedrío" de un individuo aparece frecuentemente en el movimiento barroco. Una obra muy famosa de esa época es "La fuerza del amor" de María de Zayas y Sotomayor. En este texto, la idea del libre albedrío es, de verdad, una ilusión y también, es el amor por sí mismo. SE debe considerar que la escritora María de Zayas vivía en una sociedad de mujer-opresión, especialmente con el amor mostrando la opresión y la falta del libre albedrío. En "La fuerza

del amor” fácilmente se comprueba la falta de derechos de elegir por la misma mujer. Para clarificar, la opresión es el abuso del poder donde un grupo dominante se compromete en actividades injustas, rigurosas o crueles que perpetúan una actividad o creencia que se refuerza por la sociedad y se mantiene por un desequilibrio en el poder. En suma, el tema del amor en “La fuerza del amor” es la opresión de los derechos individuales por el abuso del amor que induce a consecuencias trágicas: la inestabilidad emocional, la desconfianza en los hombres y la pérdida del alma.

Ramón María del Valle-Inclán: La paradójica de España

Presenter(s): Vazquez, Maria

Faculty Sponsor(s): Garza, Efrain

Undergraduate Presentation

09:40 - 09:55 in the Morning - Room: Aspen C

La mala situación política y social aunada a la pérdida de sus últimas colonias llevó a los intelectuales españoles a reconsiderar la historia del país ibérico. La generación del 98 se preocupaba por encontrar la verdadera propiedad o alma de España y el sentido de la vida ante el estado de apatía en el que había caído el país. Uno de los escritores más importantes de esta época es Ramón María del Valle-Inclán. Lo que lo distingue de los escritores de la generación del 98 es el estilo que cultivó a partir de 1919 llamado esperpento. Después de ese año, las obras y novelas de Valle –Inclán están escritas en un estilo intencionalmente absurdo, cruel y satírico que expresa el sentido trágico de la vida español. Creó una grave deformación de la civilización española, a través de la distorsión de héroes clásicos. De ese modo, la paradójica que se vivía en España se ve reflejada en las obras de Valle-Inclán.

Poster Presentations – Morning Session

Applied Statistics & Research Methods

The Correlation Between Exercise and Depression

Presenter(s): Cloyes, Christina

Faculty Sponsor(s): Traxler, Karen

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

The purpose of this study is to determine how strongly exercise is related to an individual's depression. If there is a significant negative correlation between the two variables, we can suggest that exercise may help to decrease overall depression. To conduct this study, we will distribute a survey to approximately seventy college students, from ages eighteen to forty years old. This survey will consist of no more than ten questions regarding the participant's age, gender, grade point average, ethnicity, anxiety, depression, and exercise. The purpose of these added variables is to distract the test takers from exercise and depression alone. The surveys will be distributed throughout classrooms at the University of Northern Colorado, as well as through Facebook. In classrooms, the students will take the survey on a piece of paper and will be given informed consent. On Facebook, I will promote the survey and discuss the consent. No individual names will be recorded, only various questions as mentioned previously. The data will only be accessed by the two researchers (Christina Cloyes and Michael McFee), and the instructor who provided the assignment for the class of Psychology Research Methods in Psychology (instructor Karen Traxler). We will use PASW (SPSS) 20.0 (2012) to enter our data and conduct the studies, on computers at UNC. After all results are finalized and the project is complete, all information will be kept confidential and stored with the two researchers and the instructor. The experimental hypothesis states, does the amount of exercise one gets affect their levels of depression? Our anticipated results are to see a strong negative correlation between exercise and depression. This would mean that as amount of exercise one has increases, their level of depression decreases.

Development and Validation of a Unidimensional Measure of Hope with a Population of Severely and Persistently Mentally Ill Individuals.

Presenter(s): Traxler, Karen; Siegrist, Mary

Faculty Sponsor(s): Traxler, Karen

Research Excellence Award Finalist

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Snyder et al. (1991) developed a two-factor and unidimensional measure of hope within the framework of goal-setting and achievement. This measure, known as The Snyder Hope Scale (SHS), has been extensively used in clinical settings even though well-defined clinical populations (encompassing severe mental illnesses) were not included in the original development and validation of the instrument. To bridge this gap in the literature, the current study, conducted in three phases, examined the psychometric properties of the SHS, using a target population of severely and persistently mentally ill individuals from a residential treatment facility located in the Eastern United States. In Phase I, reliability of the scores in the target population was assessed using Chronbach's alpha and found to be moderate (.698). Confirmatory Factor Analysis (CFA) using Lisrel 8.8 (Jöreskog, K.G. & Sörbom, D, 2006) was conducted and fit statistics were examined to assess the construct validity of the scores, which were found to be unacceptable in the target population. During Phase II, the results from the statistical analysis in Phase I were compiled, and a modified version of the SHS was sent to a panel of experts in the field of clinical psychology for review. A revised version, developed to improve the unidimensional model fit of the SHS was then created using feedback from the panel of experts. Phase III focused on implementing a pilot study in the target population using the SHS-revised. Reliability and validity of the SHS-revised scores was assessed and the results provided evidence of high reliability (.898) and acceptable model fit, suggesting that the SHS-revised could be used and interpreted in a population of severely and persistently mentally ill individuals, offering clinicians and consumers more meaningful results.

Audiology & speech-language sciences

Effectiveness of Auditory Steady-State Responses to Air and Bone Conduction Stimuli in Estimating Behavioral Audiometric Thresholds

Presenter(s): Dillman, Gwendolyn

Faculty Sponsor(s): Stoodly, Tina

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

ASSR thresholds to air and bone conduction were determined in 41 adults with normal hearing, sensorineural and conductive hearing losses at 500, 1000, 2000, and 4000 Hz and compared to measured behavioral thresholds. ASSRs were recorded using the Bio-logic® MASTER® II system with a multiple monotic stimulus. Mean differences indicate ASSR is an appropriate clinical tool for both air and bone conduction in individuals with elevated hearing levels as part of a comprehensive objective evaluation.

Chemistry

Analysis of Trace Metals in Glass by EDXRF

Presenter(s): Arizmendi, Nicole

Faculty Sponsor(s): Pringle, David

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

X-ray fluorescence (XRF) can be used to identify and quantify trace metals in a variety of glass samples. Glass samples were analyzed, and compared with other samples of different colors, origins, and textures. The objective of the project was to determine if different glass samples could be distinguished from one another using XRF. Using this data, a forensic experiment based on a hypothetical assault with a glass bottle will be written to explore the use of XRF for undergraduate forensic science students.

Determination of Blood Alcohol Concentration by Gas Chromatography Using Headspace Sampling

Presenter(s): Certain, Whitney

Faculty Sponsor(s): Pringle, David

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Drunk driving is defined as having a blood alcohol concentration of 80 mg/100 mL (0.080 %) or higher, drinking and driving is having a blood alcohol concentration of 20 mg /100 mL (0.020 %) or more. The purpose of this project is to develop a laboratory procedure for undergraduate chemistry students with an emphasis in forensic science. The method developed utilizes headspace sampling and gas chromatography with flame ionization detection, using t-butanol as an internal standard. In addition to the development of an undergraduate laboratory experience, the method will be used to investigate fetal alcohol syndrome in mice.

The Spectrophotometric Determination of the Acid Dissociation Constant of p-Nitrophenol

Presenter(s): Ash, Kitchner

Faculty Sponsor(s): Pringle, David

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

The primary focus of this research was the spectrophotometric determination of the acid dissociation constant (K_a) of p-nitrophenol, HPNP. The method investigated was the rapid dual-wavelength technique suggested by Per-Arne Johansson et al. The wavelengths of maximum absorption of HPNP and its anion, PNP⁻, are 317 and 400 nm respectively. The concentrations of HPNP and PNP⁻ were determined by measuring the absorbances of buffered solutions of PNP of various pH values at the wavelengths indicated. The value of pK_a was calculated by plotting the log [PNP⁻]/[HPNP] versus pH. The y-intercept of this curve is equal to the pK_a. The values of pK_a averaged about 6.95 ± 0.04. Application of activity coefficients resulted in a value of 7.09 ± 0.02, improving both the precision and accuracy of the method.

Who Dunit?

Presenter(s): Moss, Chelsea

Faculty Sponsor(s): Pringle, David

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

When crimes are committed with a gun, gunshot residue (GSR) plays an integral part in piecing the crime scene together. GSR can be found on numerous surfaces which include the hands of those who fired the weapon and even bystanders near the fired weapon. The goal of this research is to create an experiment for undergraduate chemistry students emphasizing forensic science. The experiment will focus on the use of scanning electron microscopy with energy dispersive analysis (SEM-EDA) and will present students with a scenario in which they must identify the actual shooter from a list of suspects based upon their SEM-EDA data.

Communication Studies

Our Values, Our Ads

Presenter(s): Stise, Robert

Faculty Sponsor(s): Allen, Lin

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

This presentation will seek to analyze an advertisement campaign from Bod Body Spray and, using the methods of analysis utilized by Chaim Perelman and Lucie Olbrechts-Tyteca, attempt to unearth values (cultural and other) that are being displayed in the advertisement. While certain values may seem obvious, such as sex as a product, or which body types are valued, a more in depth look reveals both how this company views/shapes what about men and women are attractive/desirable, and how relationships function in our society. I expect to find that in the representation of men values of attractiveness, men should, be sculpted, large muscled, and body hairless, masculinity, presented in in how they dress, act and what specifically they are doing in the advertisement, and traits of male dominance, specifically in how they interact with women. For the representation of women in these advertisements I expect to find values of attractiveness, represented in a slim and fit body type, and revealing clothing, values of femininity, presented in how these women act in ads, and values of female submission presented in how they interact with men. Further I believe that a careful analysis of this advertisement campaigns will reveal a deeper value being presented, specifically involving how it is okay to pursue sexual relationships with a women who are chemically inebriated as seen in how these women react when the body spray is used. Further that as a male it is socially acceptable to use chemicals to make yourself more attractive and therefore make women pursue you sexually and then to act on those pursuits.

Educational Studies

Linguistically Diverse Education Program Development Preliminary Findings

Presenter(s): Damsri, Chanaichon; Siegrist, Mary

Faculty Sponsor(s): Huang, Jingzi

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

The need for qualified educators trained to work with English language learners (ELL) continues to increase in Colorado. Through an Improving Teacher Quality (ITQ) Grant from the State of Colorado, UNC developed and implemented a professional development program for in-service teachers in the area of Linguistically Diverse Education (LDE) with a special education component for ELL students. The program included 12 credit hours of coursework that prepared participants to qualify for the ELA Specialist Certificate. Preliminary analysis of the project demonstrated a statistically significant growth in participants' ability to pinpoint salient linguistic features embedded in their respective course content, and participants' ability to design, adapt, and implement formative assessments that measure student growth in both subject-area content and the use of content-specific language. In addition, the lessons learned by the graduate assistants who worked on this project regarding effective ways to set up a grant funded project will be shared in this presentation.

Educational Technology

Graduate Students' Perspective about Flipped Learning Classroom

Presenter(s): Alebrahim, Fatimah

Faculty Sponsor(s): Gall, James

Research Excellence Award Finalist

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

There are many strategies for teaching that use technology to enhance students' performance. One such strategy is a method called Flipped Learning or the Inverted Classroom. It relies on technology to introduce students to course content outside of the classroom so that students can engage with it on a deeper level.

purpose of this study was to explore this new teaching method in education and collect data from students who participated in a Flipped Learning classroom. The following questions were addressed: What impact does Flipped Learning have on a graduate students' ability to comprehend content? How do the students enrolled in a higher education program describe the experience of Flipped Learning Model? What impact does the Flipped Learning model have on the students' level of anxiety regarding their ability to integrate all of the required course data?

A qualitative case study method was used to examine two graduate courses that employed the Flipped Learning strategy.

Interviews were conducted with the instructor and five of the 10 students who participated in both classes. Artifacts in the form of materials from the courses (such as reading assignments, projects, video links and writing assignments) were also collected. The data were coded and themes were developed.

The study revealed that the effectiveness of these Flipped Learning classes were influenced by a number of factors. For example, the instructor was challenged in that enough online reading materials and videos to support topics had to be prepared for the course. Effective assignments and practice activities were also required. Each student's ability to study independently and use technology effectively impacted his or her success. Students that had the motivation and could complete the required activities before class appeared to learn and apply high-level skills. Those that didn't have negative feelings about the class.

Geography

Hydraulic Modeling Comparisons, Lake of the Clouds drainage, Never Summer Mountains, Colorado

Presenter(s): Fenner, Jordan

Faculty Sponsor(s): Diggs, David

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

The proposed project uses hydrological modeling tools provided in ArcGIS. The long term purpose of this research is to better understand flows from run off and potential rock glaciers. This GIS study uses hydrological mapping tools to intricately locate specific drainage locations in the vicinity of Lake of the Clouds and associated drainages Rocky Mountain National Park. The GIS model will then be compared to modeling that was performed on the same area by the United States Geological Survey (USGS), and also aerial photography done by the National Aerial Photography Program (NAPP). These comparisons help to identify both the accuracy of the GIS Hydrological modeling techniques employed, and also the usefulness of the system for gaining a macro level understanding the study site prior to fieldwork.

Spatial Autocorrelation and Regression Analysis of Players' Hometowns: 2011/12 Season

Presenter(s): Andromeda-Focht, Bleys

Faculty Sponsor(s): Diggs, David

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

This study analyzes the hometown of every person who played one or more games in the NHL during the 2011-2012 season. Spatial autocorrelation, ordinary least squares (OLS), and geographically weighted regression (GWR) techniques were used to assess patterns of the hometowns of National Hockey League (NHL) players during the 2011-2012 season. Player and league performance statistics were used as variables in the aforementioned techniques.

Spatial regression analysis of geographic factors associated with shortgrass steppe vegetation

Presenter(s): Brandt, Amber

Faculty Sponsor(s): Diggs, David

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Species respond individualistically to environmental and geographic gradients, biotic interactions, and disturbances. However, plant species are often located in assemblages along environmental gradients based on their life history characteristics. Gaining an understanding of the complex nature of the shortgrass steppe will enable land management practices to accurately assess impacts from disturbances. Regression analysis will be completed in GIS to determine the relationships between vegetation distribution and various geographic gradients. Benefits from this research include a mapped model of Pawnee National Grassland communities that will allow adequate predictions to be made.

Higher Education & Student Affairs Leadership

Retention and Persistence for Underrepresented Students in Multicultural Greek Life: A Case Study

Presenter(s): Cruz, Carlos

Faculty Sponsor(s): Serna, Gabriel

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

With increasing numbers of underrepresented students attending college in the United States and concomitant low college graduation rates from four-year institutions for these same students, it is important to explore possible interventions that may increase persistence and retention rates among these populations. The research literature suggests a positive association between students' participation in Greek Life and persistence/retention from one year to the next. While the literature regarding the relationship between traditional Greek Life and student persistence and retention is robust, the same cannot be said for research on Multicultural Greek Life. If the same relationships are expected to hold between MCGL and student persistence and retention it becomes imperative to look at this link in the same manner. In an effort to expand the literature on this topic, we explore the relationship between institutional levels of persistence and retention at a western regional university for those who participate in Multicultural Greek Life while controlling for other relevant institutional characteristics. Because of the costs and benefits associated with a college degree, and a recent decline in the status of American higher education, as compared to other nations, policy makers, institutional administrators, researchers, parents, students, and scholars have all directed more attention to college student success. This has manifested itself most clearly in efforts to increase persistence and retention rates of both traditional and underrepresented students. Given the relative dearth of research on the impacts of MCGL and underrepresented students' persistence and retention, our study is a step towards filling this gap in the literature.

Human Rehabilitation

The Effectiveness of Holistic Treatment in Reducing Hospitalization for Individuals with Schizophrenia

Presenter(s): Boyd, Amie; Carcellero, Frankie; Kavon, Stephanie

Faculty Sponsor(s): Ososkie, Joseph

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Decompensation is characterized by hallucinations, delusions, paranoia, aggressiveness anxiety, and overall psychotic episodes. Most times decompensation leads to a short term stay at a psychiatric facility. It creates a burden financially, socially, personally and reduces the overall quality of life for many. Recurrent hospital visits are an all too familiar process for individuals and families that deal with schizophrenia. Treatment of schizophrenia to prevent decompensation is an ongoing process for those that have the disorder. The current methods of treatment in reducing decompensation include antipsychotic medication and psychotherapy. Research indicates that holistic treatment methods may have the ability to reduce some of the positive and negative symptoms associated with psychotic episodes of schizophrenia. Holistic treatment includes exercise, diet, acupuncture, and meditation. The purpose of the present research review is to determine if holistic treatment in combination with medication reduces hospitalization more than medication alone for individuals with schizophrenia. This focused research review will show that the combination of holistic treatment and medication is more effective in reducing relapse and hospitalization than antipsychotic medication alone for the treatment of schizophrenia.

Major Medical Illness/Injury Related PTSD: Resilience and Treatment Outcome

Presenter(s): Beal, Dan

Faculty Sponsor(s): Ososkie, Joseph

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Posttraumatic Stress Disorder (PTSD) is more commonly associated with veterans of past and current wars, although many cases of PTSD result from patients with major medical issues such as cancer. Major medical injury trauma as in burn victims, spinal cord injury, gun shootings, or car accidents etc, can cause PTSD as well. Resilience has been shown to positively affect treatment outcome for individuals with PTSD associated with illness and injury. This focused research review will examine current and past literature on the effects of personal resilience on current treatments of PTSD.

The Need for Fitness and Nutrition Education Programs for Individuals with Intellectual Disabilities who are Overweight or Obese

Presenter(s): Kinyon, Rebecca; Williams, Josie

Faculty Sponsor(s): Ososkie, Joseph

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Studies have shown a high prevalence of being overweight or obese for individuals with intellectual disabilities. Risk factors for individuals with intellectual disabilities who are overweight or obese include higher cholesterol, greater chance for diabetes, joint and muscle problems, higher risk for heart disease, lower self-confidence, poor self-image, and decreased social interaction. Implementing nutrition education and fitness programs for those with intellectual disabilities has shown success not only in weight loss and decreased co-morbidity, but also in lowering healthcare costs. There are several considerations to take into account when implementing nutrition education and fitness programs for individuals with intellectual disabilities including food safety, motivational needs, support systems, and learning styles. This present focused research review will bring awareness about the needs of people with intellectual disabilities who are overweight or obese and the positive outcomes that can be achieved through fitness and nutrition education programs.

Post Organ Transplant Depression and Anxiety: Prevalence, Causes and Longevity

Presenter(s): Kanzler, Mike

Faculty Sponsor(s): Ososkie, Joseph

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Over the course of the last sixty years the idea of organ transplantation has gone from an experimental process to a viable treatment for those suffering from organ failure. Researchers have found an incidence of depression and anxiety related to the transplantation occurrence. Psychological factors such as these impact medical prognosis and longevity.

The purpose of this focused research review is to examine the prevalence and cause of depression and anxiety in post-transplant recipients.

Hypothesized causes link depression to side effects of immune system suppression drugs and anxiety resulting from incurring the high cost of these immune system suppression drugs. Counseling has been shown to be effective in combating depression and anxiety experienced by transplant recipients.

Human Services

Barriers to Mental Health Services for Residents of Rural Communities

Presenter(s): Wagner, Brittney

Faculty Sponsor(s): Crow, Loree

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

This study will use qualitative methodology to explore how living in a rural setting changes the type and quality of mental health services that an individual receives. The researcher will conduct interviews with a family that has first-hand experience in the difficulties that surround receiving mental health services in a small community. The study will also explore the family's experiences with stereotypes surrounding receiving mental health services. The goal of the researcher is to present a detailed narration of how a family experiences caring for their mentally disabled child in a community that has limited resources available. The researcher will also explore the families perception on how mental health services could be improved to better serve the rural population which is perpetually underserved.

Physics

The Effects of Elevation on Muon Flux

Presenter(s): Clay, Michael; Herlea Jr, Marius; Higgins, Sean

Faculty Sponsor(s): Dietz, Richard

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Cosmic rays are high energy atomic nuclei that are constantly bombarding the Earth's atmosphere. As the cosmic rays collide with particles in the Earth's atmosphere, they produce secondary cosmic rays consisting primarily of an elementary particle known as the muon. This particle is capable of reaching the Earth's surface, allowing us to make measurements of muon flux. The purpose of our investigation is to use cosmic ray detectors to determine if there is a correlation between muon flux and elevation. Data was taken at elevations ranging from sea level to 11,307 feet. This data will demonstrate the effect of elevation on muon flux.

The Falling Tower

Presenter(s): Carlson, Benjamin; Gallegos, Carlos; Schwartz, Jeremiah

Faculty Sponsor(s): Dietz, Richard

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Towers can be observed to fall in a perhaps unexpected way; they break before they hit the ground! In our experiment, we used wooden cubes to simulate the falling tower. We modeled the falling tower by a simpler situation – a rigid rod. When one end of the rod is fixed and the other end is allowed to rotate freely, the free end of the rod will accelerate at a rate faster than it would under acceleration due to gravity. This is due to the torque acting on the rod. We found that given a certain length, width and height, we can predict the breaking point (within a certain margin of error) of said tower. We then confirmed our predictions through analysis of high speed footage of the falling tower.

Whack-A-Ball: Tennis balls and Energy conservation

Presenter(s): Caraveo, Jassiel; Gregg, Eric; Garrett, David; O'Neill, Timothy

Faculty Sponsor(s): Dietz, Richard

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

With a high speed camera at our disposal, we decided to focus on the bounce of a tennis ball as it is hit by a racquet from above while at rest on a hard surface. To do this we simply set a ball on a concrete table and took high speed images of it as we hit it with various objects: a racquet, a hammer, and a heavy ruler. Modeling the ball as a spring, we then analyzed the resulting motion to find the energy of the system at different times. After discovering the different energies of the ball, we were able to determine how efficient the transfer of energy between the objects and the tennis ball was. We found that system was not very efficient, with the final energy never rising above 25% conservation.

What Are We Seeing? Spectra of Common Light Bulbs

Presenter(s): Lorentz, Isaac; Pacheco, Richard; Wadle, Josh; Wall, Audrey

Faculty Sponsor(s): Dietz, Richard

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

We use many different light sources in daily life, but each shines a little differently. Each type of bulb emits a different range of wavelengths. Some bulbs, such as incandescent light bulbs, emit a continuous spectrum while others, such as compact florescent light bulbs, emit a spectrum with discrete lines. This experiment explores some of the reasons behind the differences in the emission spectra from different light bulbs. Using a photomultiplier tube in a spectrometer, we compared the measurements taken of the emission spectrum for several common light bulbs. We examined both continuous emission and line emission spectra from specific light bulbs. In the case of line spectra we determined what gases they contain or what the bulb may have been coated in to emit such wavelengths.

Psychology

Effect of platform depth on Morris Water Maze learning in mice

Presenter(s): Jackson, Joseph; Rutledge, Jacob

Faculty Sponsor(s): Gilliam, David

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Prenatal alcohol exposure results in fetal alcohol spectrum disorders (FASD). FASD is recognized as the most preventable cause of mental retardation. Animal models show outcomes under genetic control include differing levels of embryo lethality, brain morphology, and fetal weight gain; digit, skeletal, ocular, renal, and heart anomalies; and behavioral anomalies. C57BL/6 (B6) mice are known to exhibit all of the characteristics of FASD. In our study, we used B6 mice examine learning deficits after pre- and postnatal ethanol exposure. Litters were randomly distributed into ethanol vapor (EV; n=12) or air-only (AO; n=12) groups. EV mice were exposed to ethanol vapor for 6 hours (0900-1500hr) beginning on day 7 of pregnancy and continued until 5 days after birth. Alcohol was vaporized at the rate of 50 ml ethanol/hour to achieve average blood ethanol concentrations of 200-250 mg/dl. AO mice received air in parallel to the EV mice and served as controls. Mice from each group were measured for spatial learning using two forms of the Morris Water Maze: high platform and low platform. Subjects were trained to find a fixed platform location in both high and low conditions. Mice received 4 training trials a day for 7 days with an inter-trial interval of 3 minutes. A single probe trial was performed on day 8 where the platform was removed from the maze. Time spent in the target quadrant was compared to the time spent in the other three quadrants. Results show better spatial learning in the high platform

condition compared to the low platform condition regardless of perinatal treatment (ethanol vs. air). These results suggest platform depth is an important variable influencing mouse learning in the Morris Water Maze.

Stereotypes and their effects on first-generation college students

Presenter(s): Ward, Kimberlee

Faculty Sponsor(s): Pascoe, Elizabeth

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

More first-generation students are attending college than ever before, but they are not graduating at the same rates of non first-generation college students (Collier & Morgan 2007). Research attempting to identify, explain, and understand these differences focuses on retention rates, graduation rates, and barriers to success such as knowledge of college expectations, navigating resources, and a sense of belonging. While studies have documented how FGCSs see their role in college, less work has investigated stereotypes of FGCS and the role these stereotypes play in the success of FGCS. Specifically we are lacking information about whether FGCS perceive stereotypes among the college community regarding their FGCS status and its relationship to school-readiness, what these stereotypes might entail, and how these stereotypes (if they exist) might contribute to negative academic outcomes. These findings may lead to increased understanding of how to work with first-generation students to help them through the challenges that they face on a college campus.

WEIGHT DEFICITS IN MICE EXPOSED TO ETHANOL VAPOR

Presenter(s): Jackson, Joseph; Rutledge, Jacob

Faculty Sponsor(s): Gilliam, David

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Women who consume alcohol during pregnancy place their children at risk for a number of neuroanatomical, physical, and behavioral deficits, collectively called Fetal Alcohol Spectrum Disorder (FASD). Animal models have proven useful to explore underlying FASD mechanisms. Such models are hampered by the fact that most animals are unwilling to consume alcohol. Our laboratory has used various methods of prenatal alcohol exposure in mice to examine genetic susceptibility to behavioral and morphological birth defects. But none of these methods are appropriate for postnatal exposure – a time of rapid brain growth. In this experiment we used ethanol vapor exposure during postnatal development to examine fetal weight changes. Mice exposed to ethanol vapors on either postnatal day 7 or on days 7-9 show weight deficits at weaning compared to air-control exposed mice. These results suggest postnatal ethanol vapor exposure is a viable method to examine brain and behavior changes in the mouse. This method does not require any handling of the postnatal mice. In contrast, repeated pup intubation or subcutaneous injections require significant handling and likely increases stress. Less handling reduces the stress associated with the other methods and is thus advantageous.

Recreation, Tourism & Hospitality

An Empirical Analysis of Factors Contributing to Increased Downhill Ski Participation

Presenter(s): Hungenberg, Eric

Faculty Sponsor(s): Gould, James

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Extensive research exists illustrating the constraints (cost, location, psychological, time, ect.) that prevent individuals from actively pursuing skiing (Alexandris, Funk, & Pritchard, 2011; Kouthouris, 2005). However, little research can be found explaining what characteristics transform an individual from a casual skier to a “serious” skier, subsequently resulting in their increased participation. The purpose of this investigation was to identify which individual qualities cultivate a “serious” skier, explore what impact family upbringing and adventure/thrill sensation seeking has on a skier’s level of seriousness and examine how serious leisure may manifest itself into a lifelong commitment to skiing. Convenient sampling was utilized to survey 236 people at two ski resorts in Colorado. To measure a respondent’s serious leisure, the “measure” subscale of Gould’s (2008) SLIM model was used. Family upbringing was then measured with external variables assessing family encouragement, level of involvement and beginning age. Lastly, thrill and adventure sensation seeking was measured by using a subscale of Zuckerman’s (1964) Sensation Seeking Scale. Regression analyses indicated that measures for serious leisure, family influence, and thrill/adventure sensation seeking were significant predictors of lifelong skiing participation. Of these variables, the SLIM best predicted lifelong participation. Findings will aid ski resorts in painting a profile for their ideal customer, indicating personality and psychological traits that lead to increased ski participation. Additionally, results will motivate practitioners in marketing and sales to develop stronger strategies aimed at attracting and sustaining younger ski consumers.

Sociology

The Mistreatment in Mental Institutions

Presenter(s): Larcinese, Michelle; Tomlin, Anna; Tonelli, Rick; Trevino, Kimberly

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

There is clear evidence of abuse within institutions as well as in society which reflects a strong negative connotation of the people who struggle with a mental illness. In what ways are mentally ill people mistreated within mental institutions, with the goal to broaden society's view of the mentally ill. We analyzed literature on the topic, past and present, as well as personal accounts from people within the mental health community.

Using the social media to reinforce binge drinking normative behaviors: A comparison of American and Australian college students

Presenter(s): Jones, Kyle

Faculty Sponsor(s): Schott, Diane

Undergraduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

The central purpose of this study shows how the overestimation of the perceived normative behavior of binge drinking is the focused behavior reinforced by social networking sites (SNS), which the modern college students have incorporated into socialization. With a cross-cultural comparison, this study shows how this phenomenon of normative behavior of binge-drinking, social drinking, and non-drinking varies between undergraduates from America and Australia. The online surveying tool, Qualtrics, was used to gather information using the Alcohol Use Disorders Identification Test (AUDIT) and questions from the Pew Research center focusing on the social media. There were 119 combined undergraduate participants surveyed, from which the resulting data were used to correlate responses with the AUDIT test as well as cross culturally compare results. The results were valid with each schools results coinciding with AUDIT binge drinking test. The normative behaviors were also analyzed showing that there are different social media behaviors being in the two countries.

Special Education

Severe Disabilities in Saudi Arabia: Current Status and Improvements for the Future

Presenter(s): Shugdar, Effat

Faculty Sponsor(s): Brewer, Robin

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

The Saudi government passed legislation 50 years ago to provide free educational services for all Saudi citizens at all educational levels including those with disabilities and the system reflect thriving improvements however; students with severe disabilities often are denied an education at the secondary level. This paper presents a brief historical background of the general education and special education systems in Saudi Arabia. Education services are available and equitable everywhere for all students except those students with severe disabilities. Also, the diversity in the population of Saudi Arabia and how education services are provided for Saudi citizens and international students differs. Students with severe disabilities face a lack of special education and related services at the secondary level in the majority of cities in Saudi Arabia. The Saudi government allocates monthly stipends designating a specific amount of money for each citizen with disabilities based on their needs and provides free health care. However, there are limited special education services for those with severe disabilities, and there are no laws regulating the rights of these students in schools such as accommodations, inclusion, and appropriate aids and universal design. The students with severe disabilities also need to be able to interact with nondisabled peers in schools and communities. Based on evidence-based practices in the United States, this paper will propose recommendations and suggestions to improve the special education services for students with severe disabilities in Saudi Arabia and for those from diverse populations. One of these recommendations is establishing various facilities and agencies to serve persons with severe disabilities. Providing assistive technology is an approach that would help these students communicate and interact effectively in and out of schools. Finally, special education programs, certification and professional development must be provided to those who work with these students.

Transition Outcomes from Secondary School to Adult Life for Individuals with Intellectual Disabilities: Literature Review

Presenter(s): AlRusaiyes, Reem

Faculty Sponsor(s): Rude, Harvey

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Transition is a field that is growing in importance in the provision of educational services to students with disabilities. It is increasingly seen as an integral part of developing educational plans and then designing and providing specialized services to meet those plans for secondary students. Transition services help youth with disabilities to leave the environment of school as a student and to enter adult life as a citizen. Transition services developed out of the need to bridge this gap between student and adult life and to improve the outcomes for these individuals after leaving school. Many problems have been identified for these individuals in adult life, such as low levels of employment, post secondary school attendance, and achieving independence. Other problems include linking these individuals to adult service providers and to community resources for adults. The transition outcomes for individuals with intellectual disabilities will be addressed in this poster. Information will be provided about current status of achieving outcomes and best practice strategies to enhance this achievement. Current literature about transition services will be summarized, and implications for the future will be projected.

Sport & Exercise Science

Aging downregulates MRPs and increases cardiac doxorubicin accumulation

Presenter(s): Gibson, Noah

Faculty Sponsor(s): Gibson, Noah

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Doxorubicin (DOX) is a common antineoplastic agent used to treat cancer patients of all ages. The primary side effect of DOX treatment is a dose-dependent cardiotoxicity, which is developed in a more delayed manner in children. Multidrug resistant protein-1, -2, and -7 (MRP-1, -2, -7) are known to extrude DOX and may factor into the degree of cardiac DOX accumulation. The purpose of this study was to examine age-related differences in cardiac MRP expression and DOX accumulation. Female Sprague-Dawley rats were randomly selected to receive a 15 mg DOX/kg body weight (i.p.) at 4, 8, 12, 16, 20 or 24 weeks of age. Animals were sacrificed 24 hours following injection and hearts were excised, flushed of blood, and left ventricles (LV) were isolated. High performance liquid chromatography was utilized to quantify DOX and Western blotting to analyze MRP expression. DOX accumulation was lowest in 4-week (675±183 ng DOX/g LV) and 8-week old animals (724±247 ng DOX/g LV) and was significantly increased ($p < 0.05$) at 12-weeks (992±304 ng DOX/g LV) and 16-weeks (1068±348 ng DOX/g LV) as well as 20-weeks (1440±226 ng DOX/g LV) and 24-weeks (1321±247 ng DOX/g LV). A significant downregulation ($p < 0.05$) of MRP-2 (3-fold) and MRP-7 (4-fold) expression was seen with increasing age while no differences in MRP-1 expression were observed. These data suggest that MRP-2 and MRP-7 expression may play a role with increased DOX accumulation with age.

Cardiac Dysfunction in the Tumor Bearing Rat

Presenter(s): Parry, Traci

Faculty Sponsor(s): Hayward, Reid

Research Excellence Award Finalist

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Cardiac Dysfunction in the Tumor Bearing Rat

Parry TL, Greufe SE, Gibson NM, Hydock DS, Schneider CM, Hayward R

School of Sport and Exercise Science and the Rocky Mountain Cancer Rehabilitation Institute, University of Northern Colorado, Greeley, CO, 80639

Cancer cachexia is a disease that affects up to 80% of cancer survivors and contributes to 20 to 30% of cancer deaths. It is characterized by weight loss, muscle atrophy, weakness, fatigue, and a diminished quality of life. While there is substantial evidence that cancer cachexia can lead to skeletal muscle wasting and weakness, its role in cardiac function is not well understood.

Purpose: To determine whether cardiac function is altered in the tumor bearing rat.

Methods: Fisher 344 rats (8 weeks old) were randomly assigned to one of two groups: tumor-bearing (Tm) or non tumor bearing (NT). Animals in the Tm group were inoculated with MatBIII tumor cells (1×10^5) in the left flank. Animals in the NT group received no treatment. Two weeks later (week 10 of protocol), cardiac function was assessed both in vivo (echocardiography) and ex vivo (isolated perfused working heart).

Results: The Tm group exhibited significantly ($P < 0.05$) lower left ventricular developed pressure, maximal rate of developed pressure, fractional shortening, and posterior wall thickness during systole and diastole compared to the NT group. The Tm group also exhibited significantly ($P < 0.05$) greater left ventricular rate of pressure decline, left ventricular diameter during systole and diastole, and ejection time compared to NT animals.

Conclusion: Inoculation with MatBIII tumor cells causes significant cardiac dysfunction both in vivo and ex vivo in the Fisher 344 rat, suggesting that cancer cachexia can affect cardiac function.

Cognitive Training in a Cancer Survivor Following Radiation Therapy: A Case Study

Presenter(s): Beebe, Corey

Faculty Sponsor(s): Schneider, Carole

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Cancer patients experience many different types of side effects during and following radiation therapy. Despite the current advancement in treatments, the positive effects of treatment are often outweighed by negative effects including decreased cognitive function. Patients that have undergone radiation therapy often experience cognitive declines during, immediately following, and months to years after cessation of radiation treatment. However, little information exists on the effects of cognitive and exercise training on a cancer population. **PURPOSE:** To assess the effects of a 12-week cognitive and exercise training program on cognitive function in a cancer survivor following radiation therapy. **METHODS:** A 58 year old, female cancer survivor following radiation therapy was included in this case study. The participant completed an initial comprehensive physical assessment, cognitive assessment, Piper fatigue inventory, Beck depression inventory, and Quality of Life (QOL) assessment. Following the assessments, a 12-week computer-based cognitive training and flexibility training intervention was completed. Upon completion, the participant again performed each assessment. Percent change for each variable was calculated to show the effects of training for this participant. **RESULTS:** Depression, fatigue, and QOL all improved (-150%, -130.8%, 8.7%, respectively). An increase in the cognitive function composite score was detected, with the exception of the Wechsler Adult Intelligence Scale-Letter Number Sequence substest (14.0%, -11.1%, respectively). VO₂ peak and flexibility also improved (17.7%, 2.1%, respectively). **CONCLUSION:** Cancer treatment-related side effects can lead to decreases in cognitive function for survivors having undergone radiation therapy. The results of this study demonstrate the importance of cognitive training and exercise for cancer survivors in order to attenuate the reductions in cognitive functioning with cancer treatment.

Effects of a resistance training model on doxorubicin-induced muscle dysfunction in the rat

Presenter(s): Bredahl, Eric

Faculty Sponsor(s): Hydock, David

Research Excellence Award Finalist

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Doxorubicin (DOX) is an effective chemotherapy treatment that has been associated with a number of deleterious side effects including skeletal muscle dysfunction. Endurance exercise is effective at protecting against a variety DOX-induced toxicities, but examinations of the effects of resistance training on DOX-induced skeletal muscle dysfunction have been limited. **PURPOSE:** To examine the effects of a resistance training model in which rats rise to an erect bipedal stance to access food and water on DOX-induced muscle dysfunction. **METHODS:** Ten week old male Sprague-Dawley rats were randomly assigned to the raised cage resistance training model (RC) or sedentary (SED) group. RC animals were housed in specialized cages where food and water height were progressively increased so that rats would achieve an erect bipedal stance to access food and water. SED animals were housed in standard rat cages. Following 10 weeks of RC or SED treatments, animals received either a bolus DOX injection (15 mg/kg) or a saline injection (SAL) as a control. Five days following injections, soleus (SOL) and extensor digitorum longus (EDL) function was analyzed ex vivo. **RESULTS:** A significant decline in maximal twitch force was observed in SOL and EDL from SED+DOX (-44% and -44%, respectively, $P < 0.05$ vs. SED+SAL), but this significant reduction was not observed in RC+DOX (-22% and -24%, respectively, $P > 0.05$ vs. SED+SAL). Using a 100 s fatigue protocol, a significant reduction in force from baseline was observed at 20 s in SOL from SED+DOX ($P < 0.05$) whereas a significant reduction in force from baseline did not occur until 70 s in RC+DOX ($P < 0.05$). **CONCLUSION:** The raised cage model employed prior to DOX administration attenuated muscle dysfunction suggesting that resistance exercise may play a role in managing muscle weakness and fatigue often experienced by cancer patients receiving DOX.

Juvenile doxorubicin exposure increases cardiac progenitor cell expression in late-onset cardiotoxicities

Presenter(s): Gibson, Noah

Faculty Sponsor(s): Gibson, Noah

Research Excellence Award Finalist

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Doxorubicin (DOX) is a commonly used anthracycline antibiotic used to treat many childhood cancers. While children have a reduced risk of acute DOX-induced cardiotoxicities, they are more likely to exhibit late-onset DOX-induced cardiotoxic symptoms later in life. We hypothesized that the late-onset cardiac dysfunction is associated with a decline in cardiac progenitor cell (CPC) populations due to DOX exposure during childhood cardiac development. **PURPOSE:** The purpose of this study was to determine if late-onset DOX-induced cardiotoxicity is associated with a decline in CPC populations. **METHODS:** Twenty-five day old male Sprague-Dawley rats were randomly selected to receive 14 mg DOX/kg body weight or equivalent saline (SAL) in serial i.p.

injections of 2 mg/kg/day for 7 days. At 16-weeks of age echocardiography and Langendorff preparations were performed to assess cardiac function. Cardiomyocytes were isolated, cells expressing the stem cell factor receptor c-Kit were stained and CPCs were quantified using flow cytometry. RESULTS: Significant differences ($p < 0.05$) were observed in the following cardiac functional and geometric parameters between SAL and DOX treated animals: left ventricular developed pressure (SAL 92 ± 17 mmHg, DOX 60 ± 12 mmHg), mitral valve maximal flow velocity (SAL 98 ± 7 cm/sec, DOX 75 ± 11 cm/sec), aortic valve maximal flow velocity (SAL 104 ± 6 cm/sec, DOX 62 ± 7 cm/sec), myocardial performance index (SAL 0.68 ± 0.03 , DOX 0.91 ± 0.07), and left ventricular mass (SAL 598 ± 75 g, DOX 424 ± 128). DOX treated animals also showed a significant increase ($p < 0.05$) in CPC populations (2.5-fold) CONCLUSIONS: These data suggest that late-onset DOX-induced cardiotoxicities increase CPC populations. The increased CPC populations may be indicative of the endogenous repair mechanisms of the heart in response to the stresses of cardiomyopathies. Further research is needed to elucidate the time course of CPC populations during and following DOX exposure to determine their role in cardiac development and how they may contribute to late-onset cardiotoxicities.

Leveraging Sponsorship through Competitive Advantage

Presenter(s): Howes, Janet

Faculty Sponsor(s): Gray, Dianna

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Sponsorship of any major event is a large undertaking. Sponsorship requires a company to become fully invested in the event. The investment requires a large financial expenditure but the finances alone will not guarantee a return on investment. The sponsoring company must invest time, staff and other business assets into the project to realize a return. The sponsoring company must have a goal in place before entering the agreement with an event in order to be able to measure their return on investment. This paper discusses two Olympic Games and several Olympic sponsors and considers the leveraging of competitive advantage through sponsorship and the return on investment. Since there is limited information on some of the Olympic host cities, this paper will look at Sydney 2000 and Athens 2004, as well as individual sponsorship products relating to the Vancouver 2010 and London 2012 Olympic Games. This paper will look at the positive and negative impacts of sport sponsorship on the sponsoring company and how the companies managed to leverage their product with the Olympic movement.

Measuring Sport Team Brand Personality

Presenter(s): Davies, Melissa; Schmitt, Craig

Faculty Sponsor(s): Gray, Dianna

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

One of the more salient tasks for a sport marketer is to develop brand equity through the differentiation of the team's brand within an oversaturated sport and entertainment market. Part of brand equity is the component of brand personality which involves associating the brand with human-like traits to which consumers can relate (Aaker, 1997). While brand personality measures have been found effective within traditional business literature, those same measures have not effectively captured the sport brand personality (Ross, 2008), possibly due to the largely "symbolic, experiential, and hedonic characteristics" related with sport teams (Tsiotsou, 2012, p. 243).

In order to fill the need for a sport team-specific personality measurement, Tsiotsou (2012) used a sample of Greek sports fans to develop the sport team personality scale (SPORTEAPE) consisting of five personality dimensions: competitiveness, prestige, morality, authenticity, and credibility. The purpose of the current study was to evaluate the SPORTEAPE scale in the United States on a sample of National Lacrosse League fans using a confirmatory factor analysis. A five-factor scale showed acceptable fit in this sample, though the model suffered from a lack of discriminant validity. Future recommendations include item word revisions and varying the number of factors included in the model.

Outpatient Phases in Cancer Rehabilitation

Presenter(s): Brown, Jessica

Faculty Sponsor(s): Schneider, Carole

Research Excellence Award Finalist

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Cancer detection and treatment methods have improved significantly, which has in turn led to an estimated 12 million cancer survivors living with negative treatment-associated side effects. Rehabilitation of cancer survivors has become a problem of increasing significance with the surge in the incidence of cancer. A plethora of research investigations have shown that exercise is beneficial for cancer survivors. Yet there is not an orderly plan or system to rehabilitate cancer survivors with varying levels of acuity following diagnosis. PURPOSE: To establish appropriate phases in cancer rehabilitation that address the individual needs of cancer survivors. The phases should be built upon goals addressing varying levels of acuity and establish appropriate exercise recommendations. METHODS: Seven hundred-twenty-eight cancer survivors were grouped according to cancer history and treatment status yielding four distinct categories of care. Patient files and exercise logs from previous cancer rehabilitation participation were examined to develop exercise prescriptions and the orderly phase plan. RESULTS: Following analysis of

exercise logs, the phase system includes four phases corresponding to the four distinct categories of treatment status found in cancer survivors. Each phase consists of its own goals and appropriate exercise recommendations of intensity, duration, and frequency for the exercise prescription. CONCLUSION: Rehabilitation of cancer patients should follow an orderly plan that includes varying levels of patient acuity and appropriate exercise recommendations throughout the cancer continuum. Outpatient phases should be an essential component of cancer rehabilitation.

Strength and Cardiovascular Training on Cancer-Related Fatigue

Presenter(s): Manikowske, Trista

Faculty Sponsor(s): Schneider, Carole

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

Cancer survivors are negatively affected by fatigue both during and following treatment. Interventions consisting of cardiovascular and strength training both independently and in combination have been shown to attenuate the deleterious effects of cancer-related fatigue (CRF). PURPOSE: To examine whether strength or cardiovascular training has a greater effect on CRF in cancer survivors following an individualized 3-month training intervention. METHODS: Nineteen cancer survivors (ages 58 ± 13 years) completed initial assessments of cardiovascular (VO_{2peak}), strength (chest and leg press), and CRF (Piper Fatigue Scale). Participants then completed 3-months of supervised exercise training at 60 minutes a day; 3 days per week. The intervention consisted of progressive cardiovascular and whole-body strength training. Participants were then reassessed following the intervention. RESULTS: There were significant increases in pre to post VO_{2peak} (19.1 to 23.4 mL•kg⁻¹•min⁻¹; $p=.006$), chest press (50.3 to 62.0 lbs.; $p=.016$), and leg press (143.2 to 190.8 lbs.; $p=.000$). CRF significantly decreased (4.37 to 2.97; $p=.006$) from pre to post exercise. A negative correlation was observed between CRF and leg press ($p=.07$, $r=-.430$) and VO_{2peak} ($p=.36$, $r=-.23$), however, a positive correlation was seen with chest press ($p=.55$, $r=.15$). This suggests that lower body exercises may have a greater effect on the reduction of CRF than cardiovascular fitness. CONCLUSION: Cancer treatment-related side-effects lengthen the recovery process post treatment for cancer survivors. The results of this study demonstrate that exercise interventions increase strength and cardiovascular fitness while decreasing CRF. Cardiovascular fitness and lower body strength correlate with a reduction in CRF. Lower body strength was shown to have a higher correlation with decreased CRF than upper body strength or cardiovascular fitness. Therefore, physical activity programs for cancer survivors with a goal of reducing CRF should incorporate lower body strength training.

Toward a Global Sport Sponsorship Model: Implementing the Actual Purchase

Presenter(s): Zaharia, Noni; Mayer, K.C.; Hungenberg, Eric

Faculty Sponsor(s): Gray, Dianna

Graduate Presentation

09:00 - 11:00 in the Morning - Room: Mt. Evans & Pikes Peak

The focus of this study is to test the application of the actual purchase behavior into a sport sponsorship model. The majority of the studies have used purchase/behavioral intentions as the final indicator to evaluate sport sponsorship effectiveness, but no research empirically-tested the actual purchase decision in a sponsorship model. This paper will argue that sport sponsorship models should implement the actual purchase behavior as the endpoint of sponsorship effectiveness because customers' opinions may change between the time of the survey and the time of following their actual purchase decision. In addition, a surveyee may provide his or her own intention to purchase the item, but other persons in the respondent's household may also play a part in the actual purchase decision. Furthermore, this study will attempt to establish a global sport sponsorship model that can better help all parties involved in the sport industry. Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) will be used to understand differences between respondents who will manifest their intention to buy but do not purchase a product/service and those subjects who are having not only the intention to purchase, but also who are making the actual purchase. This research will strive to provide evidence that purchase/behavioral intentions are not a predictor of actual purchases of a specific sponsor's products or services. Moreover, the researchers expect that the actual purchase variable will result in being the final indicator not only in this sponsorship model, but also in upcoming and improved sport sponsorship models.

Poster Presentations – Afternoon Session

Africana Studies

The Shift of Consciousness in African American Television

Presenter(s): Houston, Jasmine

Faculty Sponsor(s): Gardner, Mitchell

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

This investigation addresses roles portrayed by black people, more specifically black females, in current television series. In the past, the writers and executive producers more positively depicted black family roles in shows like “The Cosbys” and “The Fresh Prince.” However, the lack of comparable images of black families in the recent television series and reality television shows reveals that stereotypes have changed. The examiner describes stereotypes that are presently portrayed on television and scrutinizes several reality television shows such as “love and hip-hop” and “basketball wives.” By using the snowballing method (Babbie, 2001), the investigator will elicit data from 10 black undergraduate students at the University of Northern Colorado. This study seeks to create an awareness of the shift in consciousness of the black females from what appeared to be a wholesome consciousness in 1990s to a longing for violence. Also this examiner seeks to increase an understanding of the difference between Realities in television. Lastly, the investigator seeks to develop steps that address wholesome consciousness and promote healthy realities for black females.

Applied Statistics & Research Methods

Beyond IRB: The Role of Relational Ethics in Research with Vulnerable Populations

Presenter(s): Christensen, Wendy; Kincaid, Tyler; Landram, Suzy; Reavill, David

Faculty Sponsor(s): Lahman, Maria

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Although all researchers must certify that their human-subjects research meets a basic ethical standard, beyond this standard there are multiple approaches to ethics in research. Institutional Review Boards (IRB), which are required for all human-subjects research in the United States, represent a procedural/rules-based ethics perspective. Relational ethics is a perspective that is centered around relationships between people, and is an important complement to IRB.

Modern Western scientific ethic was dramatically influenced by instances of severe mistreatment of human participants by scientists and medical professionals (e.g. Nazi human experimentation during WWII). The IRB system is intended to prevent the worst harm through legal and procedural protections. While this system works well in preventing severe harm, it is fundamentally a failure-based model because ethically-questionable actions by researchers can only be addressed after they occur. A relational ethics perspective strengthens participant protection because it goes beyond simple rules violations and demands increased foresight. Another weakness of the procedural ethics perspective is its inflexible treatment of “vulnerable” populations. Populations that are federally protected include children, elderly, mentally disabled persons, prisoners, and pregnant women (e.g. fetuses). While most people would agree that exercising particular care when researching these populations is appropriate, a relational ethics approach suggests that such clearly-delineated boundaries between “vulnerable” and “not vulnerable” almost never exist in practice. In the spirit of beneficence, researchers must balance the need to protect all participants, who are all vulnerable to some extent, without paternalizing them. Finally, although IRB and most scientific organizations have clear guidelines on ethical data usage, a relational ethics perspective demands that researchers must do more than just protect the privacy and confidentiality of participants. Rather, researchers must also recognize that data represent actual pe

Audiology & Speech-Language Sciences

Auditory Status of Youth Who Shoot Recreational Firearms

Presenter(s): Johnson, Leann; Holm, Kristen

Faculty Sponsor(s): Meinke, Deanna

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Firearms generate high level impulse sounds that are known to damage the delicate structures of the inner ear and cause hearing loss (Axelson et al., 1987, Holmes et al. 1997, Kramer and Woods, 1982). Otoacoustic emissions (OAEs) are low-level sounds that are produced by the cochlea's outer hair cells. Almost all people with normal hearing and some with hearing-impairment will produce OAEs. The presence or absence of OAEs can provide information about inner ear changes due to hazardous noise exposures. OAEs have been found to demonstrate early signs of noise induced hearing loss (NIHL) before it becomes evident on a conventional hearing test (Arnold et al., 1990, Avan et al., 1995, 1997, Dorn et al., 1999, Konopka et al., 2005, Yates and Withnell, 1999). Ahmed et al. (2001) has also suggested that ultra-high-frequency (UHF) hearing loss may also be an early indicator of NIHL. The purpose of this research is to evaluate the auditory status of youth (aged 10-15 years) who shoot recreational firearms as compared to a control group that does not shoot. For this study, auditory status will be evaluated with conventional audiometry using pure-tone air conduction hearing testing 500-8000 Hz, ultra-high-frequency audiometry (HFA) 10000-20000 Hz and distortion product otoacoustic emissions (DPOAEs). For DPOAE testing, each participant will have a 12 frequency DPOAE scan administered (1600-6300 Hz). DPOAE data will consist of the distortion product amplitude (DP), noise floor (NF), and signal to noise ratio (SNR) for each test frequency. Data collection is currently underway, and preliminary findings suggest a trend towards reduced UHF hearing thresholds and DPOAE amplitudes for the experimental group shooting recreational firearms.

How Individuals who Stutter, Graduate Student Clinicians, and an Experienced Speech-Language Pathologist Perceive Success in Fluency Therapy

Presenter(s): Ortega, Evelyn

Faculty Sponsor(s): Murza, Kimberly

Research Excellence Award Finalist

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Since the inception of stuttering therapy, the field of speech-language pathology has become increasingly evidence-based; this trend has led clinicians to pursue techniques that are more successful. However, there are still some gaps in the research about successful fluency therapy. Current research needs to look at the experiences and perceptions of people who stutter as well as their perceptions of fluency therapy. By considering clients' attitudes toward fluency therapy, personality traits, life events, and specific therapeutic characteristics, speech-language pathologists will gain a better understanding of what successful therapy can entail. In addition, few recent studies have explored the clinician's point of view as well as the experiences and perceptions of clients. These studies have concluded that both perspectives should be included in treatment planning. While previous research has reported clients' and clinicians' perceptions of fluency therapy separately, this research considers both views simultaneously. The results from this qualitative study will aid speech-language pathologists in considering the factors that can create a successful fluency therapy session. Participants for this study were adults who stutter, graduate assistant clinicians, and a clinical educator. The participants who stutter were interviewed to determine if personality traits, hobbies, outside support, life events, or specific therapeutic characteristics influence success. The clinicians were asked what they have observed to be successful in speech therapy and what they believe their clients perceive as vital in fluency sessions. The data collected from three types of people involved with stuttering therapy were transcribed and analyzed to generate themes. Expected results of this research highlight factors that contributed to perceptions of success.

Biological Sciences

Epithelial to Mesenchymal Transition Induction by zfh-1

Presenter(s): Kennedy, Rana

Faculty Sponsor(s): Leatherman, Judith

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Epithelial to Mesenchymal Transition (EMT) is an important step in the metastasis of carcinomas, but it is not a well understood process. *Drosophila* is an ideal model organism in which to study EMT, since individual cells within an intact *in vivo* epithelium can be genetically manipulated to investigate the genes involved in EMT. For this project a model will be developed which can be used to induce and observe the process of EMT in the follicular epithelium of the *Drosophila* ovary. There are several genes which have been identified as "master regulators" of EMT; these include *snail*, *twist*, *ZEB1*, and *ZEB2*. The gene *zfh-1* is the sole *Drosophila* ortholog of the ZEB family of genes. Expression of the gene *zfh-1* will be activated within individual cells in the epithelium using the "flip-on" method of mitotic recombination. The tissue will then be evaluated using immunofluorescence to determine if the altered cells remained within the epithelial sheet, and to determine the state of epithelial differentiation. Induction of coexpression of the oncogene *RasV12* along with *zfh-1* will also be completed to more closely mimic tumor progression. The long-term goal with this project is to discover new genes that are required for EMT by performing a genetic screen for genes which modify the ability of *zfh-1* to induce EMT. Thus far, the immunofluorescence technique has been learned and successfully completed on wild type *Drosophila* ovaries. Stains of the *Drosophila* ovaries for phospho-histone 3 have also

been completed to observe the mitotic division of the follicular epithelial cells of the germarium; this information will be used to determine the stage at which these cells stop dividing. This information will then be used to decide which stage of the germarium on which to focus this study.

An Examination of the Cytotoxic Effects of Snake Venom on Human Colon Cancer Cells

Presenter(s): Maxey, Elizabeth

Faculty Sponsor(s): Mackessy, Stephen

Research Excellence Award Finalist

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans

Snake venom is a complex mixture of enzymes, proteins and other substances with toxic/lethal properties which immobilize and aid in digestion of prey. Venom's biological effects are caused primarily by many proteins found in the venom. Some of these proteins may provide novel leads for drug discovery, with applications to many human diseases. Cancers are characterized by uncontrolled growth and metastatic spread of abnormal cells that commonly results in death; colorectal cancer is the fourth most commonly diagnosed and second most lethal cancer in the United States (2011). Treatment options for colon cancer are limited, depending on the stage of the cancer at diagnosis, illustrating the need for new therapeutics. In this study, the cytotoxicity of Pseudechis porphyriacus venom and purified proteins toward Colo205 cancer cells was explored. Previous work showed that the venom contains metalloproteinases (SVMPs), phospholipases A2 (PLA2), three-fingered toxins (3FTxs) and cysteine-rich secretory proteins (CRiSPs); in spite of these components, the venom is only moderately toxic (LD50 ~2.5 mg/kg). Crude Pseudechis venom showed potent, dose-dependent toxicity toward Colo205 cells. Fractionation of crude venom via cation-exchange FPLC resulted in 13 prominent peaks, primarily 6 and 14 kDa proteins; peaks 1, 11, 12, 13 were cytotoxic. Purification of the cytotoxic proteins was performed via reverse-phase HPLC. The purified proteins ranged from having no cytotoxic effect to moderate/potent cytotoxic effect on Colo205 cells. Mass spectrometry was used to aid in identification of each purified protein. The need to develop alternative treatments for colorectal cancer is essential, as current options are limited and often have severe side effects, due in part to the sensitivity of the colorectal area to traditional cancer therapies. If apparent anti-cancer effects observed with this venom and its purified proteins are specific, these results may produce leads for novel drug therapies to treat colorectal cancer.

Identification of Dopamine Receptors on a Class of Mouse Prefrontal Cortical Neurons

Presenter(s): Cowper, Laura

Faculty Sponsor(s): Thomas, Mark

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Working memory (WM) is a form of memory used to hold specific information in mind for the performance of a task. The prefrontal cortex (PFC) is the area of the brain involved in WM. Normal WM requires appropriate levels of the brain transmitter, dopamine. In humans and animals, EEG recordings during WM tasks reveal cohesive electrical rhythmic activity in the PFC. Our research is aimed at understanding the cellular properties of mouse neurons that generate rhythmic activity in PFC neurons that contribute to WM processes, and how they are modulated by dopamine.

The principal output neurons of the PFC are located in the deep layers (Layer 5). Recent studies have identified at least two types of Layer 5 cells, which differ in shape, regions of projection, and electrical properties. The class of L5 neurons projecting to the brainstem (where they may regulate motor aspects of WM tasks) can be visually identified with markers for the transcription factor Otx-1. Dopamine mediates its effects through two types of receptors, D1 and D2. It has been proposed by others that brainstem-projecting L5 pyramidal cells are the only L5 cells that express D2-type dopamine receptors. We will test this hypothesis by identifying neurons that express both Otx-1 and D2-type receptors (D2R).

Immunocytochemical methods will be used to identify Otx-1 and D2 receptors. 40 micron slices from the PFC will be made from fixed and frozen C57-BL/6 mouse brains. The slices will be incubated overnight in mouse anti-Otx-1 antibodies and rabbit anti-D2R antibodies. The slices will then be incubated in anti-mouse Alexa 488-conjugated antibodies and secondary anti-rabbit Alexa 568-conjugated antibodies, for one hour. Fluorescence will be viewed with a confocal microscope, with green fluorescence identifying Otx-1 positive cells, and orange fluorescence identifying D2R-positive cells. We predict that only Otx-1-expressing cells will stain for D2R's.

Separating heterotrophic and autotrophic respiration contributions to winter soil carbon efflux

Presenter(s): Beverly, Daniel; Whitehead, Kathryn

Faculty Sponsor(s): Franklin, Scott

Graduate and Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Soil respiration is the largest carbon efflux in forest ecosystems and is a product of microbial decomposition and vegetative root respiration. Subalpine soil respiration varies with temperature and seasonal fluctuations. Most studies assume winter carbon efflux is zero or negligible, but few studies have accounted for soil respiration under snowpack. We quantified winter soil respiration following salvage logging of subalpine forest infested by mountain pine beetle (MPB). Logging has increased

substantially following MPB infestation. Field carbon effluxes were collected between three sivilcultural treatments and untreated stands using an EGM4 gas monitor system. A subsequent study was designed to quantify and separate soil respiration derived from microbial decomposition and autotrophic respiration of dormant *Psuedotsuga menziesii*. Field soil samples were collected to replicate the natural soil fauna of *P. menziesii* stands. A closed chamber apparatus was built to quantify respiration between four treatments (sterilized soils with and without seedlings, and non-sterilized soils with and without seedlings.) The chambers were stored at 4° C reducing tree (we recorded no photosynthetic activity) and microbe activity. Carbon efflux measurements were quantified with a LiCor 6400 soil respiration system. Following efflux measurements, soil samples from each treatment were collected and measured for concentration of bacteria and fungi. Preliminary results from chamber study reveal no differences between treatments. Results from the field showed no differences among sivilcultural treatments, but carbon effluxes in treated sites were significantly higher than untreated sites. Winter carbon effluxes of subalpine forests were significantly lower than summer effluxes, but respiration through snowpack was significantly higher than previous studies suggest. Subalpine forests are covered with snow for large portions of the year, thus incorporating winter soil respiration is essential to obtain an accurate carbon budget for subalpine forests.

Serine Proteinases in Venom of the Yucatan Rattlesnake *Crotalus simus tzabcan*

Presenter(s): Caudillo, Ana

Faculty Sponsor(s): Mackessy, Stephen

Research Excellence Award Finalist

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Snake venoms comprise a complex mixture of macromolecules, primarily proteins, that can cause cataclysmic destructive changes to living tissues when injected by a snake. Somewhat enigmatically, these same molecules have high potential for medicinal purposes, because most venom components are mimics of natural regulators of body functions. Previous studies have revealed that serine proteases in venoms interact with the blood coagulation cascade, a complex series of protease-mediated reactions in the body which regulate and the thrombin-like serine proteases (TLSP) act preferentially on fibrinogen. The isolation and manipulation of these proteins could directly contribute to the treatment of clotting disorders, acute hypertension, and even some cancers. New drug candidates are necessary because current drugs have undesired side effects and several newer candidates have recently failed in clinical trials. To address this need, I am examining TLSPs from the venom of the Yucatan Rattlesnake (*Crotalus simus tzabcan*), a species whose venom has not been investigated but which contains abundant serine proteases. Isolation of a TLSP has just been completed using a three step chromatographic purification protocol (low pressure size exclusion, ion exchange and reversed phase). Initial characterization of this purified protein include determination of its mass, specific activity and possible inhibitors. In addition, I will evaluate other physical characteristics of the protein such as extent of glycosylation, which can influence physiological stability and resistance to endogenous proteases, and specific activity toward fibrinogen and other natural substrates. Identification of these properties are the first steps toward a future therapeutic, and if these are positive, biological testing in a rodent model will be undertaken. This research further demonstrates the potential for new and more specific-acting drugs from natural sources, and animal venoms contain a wealth of candidate molecules potentially useful for treating human diseases.

Chemistry

Scientifically Successful Nonmainstream Undergraduates' Perceptions of Chemistry

Presenter(s): Cink, Ruth

Faculty Sponsor(s): Song, Youngjin

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Over the past two decades, researchers and educators have explored how nonmainstream school-age students learn science differently from nonmainstream students. The students' sociolinguistic backgrounds impact how they perceive, learn, and discuss science. However, little research has been done on understanding how nonmainstream undergraduates grasp science differently from mainstream students, especially in chemistry classrooms. This research intends to start exploring that topic by interviewing scientifically successful nonmainstream students about their perceptions of chemistry during their undergraduate education. This phenomenology specifically looks at students who were learning English at the time of their undergraduate chemistry education. The students are now upperclassmen or graduate students in chemistry or biochemistry. Common themes among the interviewees include appreciating the tangibility of chemistry in laboratories, relying on support systems, and viewing chemistry as a language. These findings imply that altering instructional strategies may benefit the nonmainstream students in chemistry classrooms. Instructional strategies developed for nonmainstream school-age science students should be explored for teaching nonmainstream undergraduate chemistry students.

Counseling Psychology

Combat Guilt: A Preliminary Examination of the Current State of the Literature and Directions for Future Research

Presenter(s): Kacmarski, Jason

Faculty Sponsor(s): Rings, Jeffrey

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The experience of combat guilt among United States Veterans has been the focus of increased attention over the past few years, with researchers beginning to examine the effects that this particular strain of guilt can have on the long-term mental health of combat personnel post-deployment. Initial research with Veterans has indicated a potential link between the experience of combat guilt and the exacerbation of both (a) symptoms associated with posttraumatic stress disorder (PTSD) and (b) suicide risk. However, complicating attempts to understand and explore the phenomenon of combat guilt is a current lack of agreement on a formal definition of combat guilt as a construct. Numerous researchers have presented conflicting conceptualizations of the experience of combat guilt, and the landscape has been further muddied by the recent introduction of the concept of moral injury to the military mental health literature. A lack of clarity around this topic has hindered attempts to create appropriate diagnostic tools and measures to accurately assess for combat guilt, and this in turn has slowed the pace at which effective treatments for it are developed. In order to bring a greater sense of coherence to this debate, a comprehensive literature review was undertaken with the goals of assessing the current collective knowledge on combat guilt, developing a more unified definition of this construct, and identifying the more salient avenues for future research. By focusing on commonalities among current disparate definitions of combat guilt, an overarching definition is proposed. Directions for future research in areas such as assessment and treatment development, especially as they relate to the important topics of PTSD and suicide risk among the Veteran population, are discussed.

Criminal Justice

A Content Analysis of Media Coverage, Victim, Offender, and Sentence

Presenter(s): Trujillo, Miguel

Faculty Sponsor(s): West-Smith, Mary

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Although the murder rate is decreasing, the press continues to distort the frequency of murder in crime news. Research indicates that violent crimes with minority offenders and white victims receive more prominent news coverage. Distortions in crime media have possible effects on stages of the criminal justice system, such as decision to prosecute and appeal. Studies on crime coverage in the media have looked at newsworthiness attributed to characteristics of the crime. However, these studies have not examined relationships among the characteristics of the crime, characteristics of victim and offender, and sentences received. To explore these relationships, this content analysis examined the news coverage of homicides in The New York Times using a purposive sample of 45 articles from 2000-2012. The murders all involved one victim and one offender and the articles followed the crime from the initial report through sentencing. Variables were coded and entered in a database and analyzed through chi square analyses. Preliminary findings support past research that shows that significantly more news coverage is given to homicides with a white victim and a black offender. The results add to the research about newsworthiness in crime news and the effect of news coverage on stages of the criminal justice system.

Fingerprint Enhancement on Used Prophylactics

Presenter(s): McCartney, Michael

Faculty Sponsor(s): Price, Alan

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The research focused upon the techniques of enhancing fingerprints on used condoms. This project selected six of the major brands and four styles of condoms for testing. The selected condoms were divided into two testing samples. One sample, a latent fingerprint was placed 25 days prior to processing to simulate evidence storage. The second sample, using the same condom brands and styles, had a latent fingerprint placed 24 hours prior to processing. A sebaceous standard was placed upon the researcher's finger prior to the placement of the latent print on all the condoms. Various styles of condoms were also used, i.e. lubricated, non-lubricated, ribbed, and smooth. The four categories of latent print development used during this enhancement process were cyanoacrylate ester (superglue) fuming followed by magnetic powder, cyanoacrylate ester fuming followed by cyano blue distain followed by alternative light source (ALS), cyanoacrylate ester fuming followed by sudan black dye, and small particle reagent (SPR). The results show no method of processing to be adequate in the processing of latent fingerprints from

condoms, even though all methods produced at least one print that was ranked as not of value (showed some ridge detail of latent print, but too minimal to give useable results). The method with the ALS proved to be the best method of the four in terms of showing ridge detail, but needs further photography processing to detect the latent print.

Educational Psychology

Executive Function and Incentives

Presenter(s): Rohrbacher, Caitlin Rohrbach

Faculty Sponsor(s): Welsh, Marilyn

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The purpose of this study was to examine the construct of executive functions, a domain of cognitive skills mediated by the prefrontal cortex of the brain and involving future-oriented, goal-directed behavior. Recent research indicates the possibility of “hot” executive functions, which include inhibition, flexibility, and planning under conditions of heightened motivation, as well as “cool” executive functions, which are the same types of cognitive processes without the addition of motivational forces. This study was an attempt to incentivize or “heat up” traditionally “cool” executive function tasks. It was hypothesized that scores on the Tower of London and Letter-Number Sequencing tasks given to students under incentive conditions would significantly correlate at a moderate to high level with scores on the Iowa Gambling Test, a traditional hot executive function task. It was further hypothesized that scores on the Tower of London and Letter-Number Sequencing tasks given to students under non-incentive conditions would correlate at a non-significant or low level with scores on the Iowa Gambling Test. The sample of 50 (39 females, 11 males) was recruited from the Psych 120 participant pool through the SONA system. Although the results showed there was no difference in mean scores on the TOL under hot and cool conditions, there was a significant practice effect on the TOL from the first administration to the second administration. In addition, higher scores on the TOL-hot correlated with more adaptive choices on the IGT. There were no significant correlations between the scores on the TOL-cool and the IGT scores. All of the significant correlations between the TOL-hot and adaptive IGT scores occurred when the participant was administered the tasks under the incentive condition first.

Today's Textbooks in Tomorrow's Classrooms: An Annotated Bibliography

Presenter(s): Rumpf, Tabitha

Faculty Sponsor(s): Diaz, Abel

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The current research project surveys the literature available on the topic of attitudes and beliefs in relation to textbook use for learning and instruction in higher education. We list a selection of 25 key publications related to this topic, and provide a summary for each of the papers. Moreover, we discuss what research is conducted, its application, relevancy to education, and how it compares to our own topic. Findings show that grade level for research is diverse ranging from elementary on into higher education. In primary education grade levels, research is focus solely on instructors' attitudes and beliefs. In regards to higher education current research is focusing more on the transition from using the printed textbook to digital formats. This does not put an emphasis on the attitudes and beliefs on textbook use but rather focuses on the textbook accessibility and format. Among research found pertaining to attitudes and beliefs, there was minimal research that focused on the emotions students and teachers have towards textbooks in regards to their use in learning and instruction. Literacy proves to be a construct that is closely related to textbook research. This line of theory does not provide substantial results on the attitudes and beliefs in relationship to textbook use but rather focuses on how students are reading as opposed to how students feel about their textbook. The research audience will experience a poster that describes the aforementioned research results. The poster will include excerpts from key publications, the methodology used and the purpose for conducting the research. The purpose of this research is to illuminate the current trends orbiting around textbooks and highlight the importance of understanding attitudes and beliefs on textbook use and its influence on learning and teaching.

Educational Technology

Attitudes of International College Students in the U.S. towards Educational Technologies

Presenter(s): Alebrahim, Fatimah; AlMonuf, Hadi; Almaden, Abdullah

Faculty Sponsor(s): Gall, James

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The history of technological innovation has paralleled the history of the human race. As human beings sought to protect themselves from predators and the weather and increase the ability to feed themselves, they created simple tools that developed into more complex technologies. Technologies eventually led to widespread literacy, and then the mass production of goods, eventually reaching our current digital age with its global communications.

Our study examined the perceptions of international students on the topic of technology integration in the teaching of courses at a mid-sized, western U.S. university. Examining the perceptions of a target audience is a widely used strategy based on the hypothesis that perceptions matter and often influence behaviors. Using technology in classroom settings can be a real challenge for some international students, especially those who come from a country where technology use is less widespread. The use of unfamiliar technology can make their learning process more difficult.

The purpose of the study was to examine international students' level of experience, background knowledge, confidence with technology, and the impact of technology on their education. The research questions were: What technologies do international students own and use for their studies? What is the perceived impact of technology on international student learning? What are the perceptions of international students regarding their instructor's use of technology in the classroom? A survey was developed, partially based on a survey developed by the EDUCAUSE Center for Applied Research (2012). It recorded background information, digital device ownership and use, perceptions regarding technology importance, and perceptions regarding instructor use of technology. This presentation will describe the study in detail and share the final results. Implications and suggestions for further research will also be shared.

Speaking Out of School: A Content Analysis of World of Warcraft Forums

Presenter(s): Alebrahim, Fatimah; Alruwaili, Tahani; Alawami, Nariman

Faculty Sponsor(s): Gall, James

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The researchers will discuss the results of a study that examined World of Warcraft players' attitudes and beliefs about education and schooling through discussions in online game forums. Through the use of content analysis, discussion threads containing terms relevant to education and schooling in official player forums were selected.

WoW provides a rich environment for investigating how learning takes place in virtual worlds and may suggest ways to enhance digital learning in educational settings. There are several ways in which WoW may impact learning. For example, there are general cognitive, social, and behavioral skills used in the game that can influence learning regardless of the specific academic subject

The researchers examined WoW players' attitudes and beliefs about education and schooling through their discussions in online game forums. By applying a methodology similar to Steinkuehler & Duncan (2008), we used content analysis to identify discussion threads containing terms relevant to education and schooling in official World of Warcraft player forums (<http://forums.worldofwarcraft.com>). These forum discussions represent authentic artifacts created by WoW players. As such, they provide an alternative source of evidence regarding attitudes and beliefs than interviews and surveys. Common themes were identified through the coding of the data collected.

The researchers will present the results of the study in the form of the major themes. In addition, they will describe the content analysis methodology that was used. Implications of the identified themes on the use of online games in education and on digital learning in general will be discussed.

English

Censorship in History Textbooks: How Knowledge of the Past is being Constructed in Schools

Presenter(s): Brunner, Tyler

Faculty Sponsor(s): Desjardins, Molly

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

This article examines how pressure groups organized around political correctness and religious conservatism lead textbook publishers to self-censor. This self-censorship ultimately results in dry, unenlightened prose. By rhetorically analyzing the coverage of the terrorist attacks on 9/11 in *The Americans*, I illustrate how censorship affects the teaching of history. Dull text in *The Americans* illuminates censorship' present infiltration into school curriculum. Such uninformative material distracts from an actual productive form of teaching history. This study attempts to prove that textbook publishers' self-censoring of material creates a teaching of history which degrades knowledge and promotes the ideologies of certain pressure groups.

Geography

Determining Bat Roost Preferences and Water Value with Spatial Statistics

Presenter(s): Craven, Katelin

Faculty Sponsor(s): Diggs, David

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Bats in the Rocky Mountain West are already at risk due to habitat loss, human persecution, mine and cave closures and disturbance, and White-nose Syndrome. In addition, global climate change is leading to an increase in drought conditions and decrease in water availability, which would lead to greater water loss by bats in their hot day roosts and greater distance between water sources. Researchers have found that bats choose their roosts based on very specific temperatures, humidity, safety, other bat use, parasite infestation etc. Because bats must replenish their water supply immediately when they exit their roosts at dusk, I tested whether bats in the foothills of Boulder County are preferentially choosing roosts based on their proximity to water in addition to the other known criteria because it is the limiting factor in the arid west. Spatial statistics were used to examine what factors make water holes most valuable to bats such as diameter or distance to the nearest water source. Both of these questions provide valuable information to land managers about prioritizing roost and/or riparian habitat to protect from development to maintain bat populations.

Spatial Analysis of the Distribution of Global Refugees in Greeley, Colorado 2010-2012

Presenter(s): McMonagle, Emily

Faculty Sponsor(s): Diggs, David

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

This project involves analyzing the locations of Global Refugees in Colorado. The research draws upon data that was collected from the Global Refugee Center (GRC) located in Greeley. The GRC is a non-profit organization that works with the refugee population in Greeley. By utilizing the data from the GRC, the project focuses on cluster-analysis. Various cluster analysis techniques have been utilized to show the differentiation between the various languages spoken by the global refugees in Greeley.

Spatial Regression Analysis of Refugee Settlement: Greeley, Colorado, 2012-2013

Presenter(s): Yeager, Kyle

Faculty Sponsor(s): Diggs, David

Research Excellence Award Finalist

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

This project is going to look at the location of refugees in Greeley Colorado and Census Block Group information such as income levels, education, density, and crime to see if there's any correlation. The significance of this study is to look at the refugee conditions in the western United States. The hypothesis is refugee settlement in Greeley, Colorado is determined by factors such as density, educational levels, income, and cost of living. Research methodology includes using survey information provided by the Global Refugee Center of 488 refugees in Greeley. Census block group information will also be used. The program to map out the regression analysis will be ArcGIS. The project will first begin with Ordinary Least Squares Analysis to see if there is any strong correlation between location of refugee settlement and factors such as education, income, and cost of living. Next step in the process will be using tools to assure that spatial autocorrelation is not present within the data. From there Geographically Weighted Regression will be used as it accounts for local variation more accurately as compared to Ordinary Least Squares. The Anticipated outcome of this project is that there will be correlation present between refugee settlement and income levels and cost of living. Current research conclusions have found no correlation between housing density and refugee settlement.

Higher Education & Student Affairs Leadership

Veterans as Students vs. Non-Traditional Students in College: Common Experiences, Attitudes of Traditional Students, and a Global Measure of Perceived Stress

Presenter(s): Ramsey, Ian

Faculty Sponsor(s): Traxler, Karen

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Recent research on Veterans of the Afghanistan and Iraq Wars focuses primarily on helping to overcome the emotional and physical scars of war but little attention has been given to uninjured Veterans trying to rejoin civilian life. Many Veterans choose to use their benefits to enroll in college to gain skills to put toward the workforce. Similarly, a growing number of students in college are non-traditional students entering or returning to school to supplement their education. Both Veterans and non-traditional students are important minorities within the higher education community and while Veterans are often the focus of studies to better help them succeed socially and academically, non-traditional students are often a demographic that is overlooked when not being compared to traditional students. Likewise, when non-traditional students are compared to traditional college students Veterans' needs are not distinguished from other non-traditional students'. The current study utilized a three part survey to examine similarities and differences in experiences between Veterans and non-traditional students in college, the attitudes of traditional students toward both Veterans and non-traditional students, and self-perceived stress in all three student groups using the Global Measure of Perceived Stress Inventory (Cohen, Kamarck & Mermelstein 1983).

History

Women on Trial

Presenter(s): Fassler, Gaylynn

Faculty Sponsor(s): Melish, Jacob

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

This research project is a poster board detailing the women that were prosecuted for their crimes during the Nuremberg Trials. At the Bergen-Belsen Trial, one of the many trials that were part of the Nuremberg Trials, there were forty- five people being charged, including twenty- one women. Also, at the Doctor's Trial at Nuremberg, there were twenty- three doctors that were being prosecuted for inhumane practices, and one of the defendants was a woman. This was a project for History of the Holocaust class this last summer, and I am currently continuing with this research in my Senior Seminar. The information on display was compiled using mostly trial transcripts, which I found translated into English online. The poster talks about the women as an overview, discussing what they were on trial for and who the women were, as well as detailing the three women that were hanged for their crimes. There is also information about the convictions that were set forth for these women, as well as a general overview of the Bergen-Belsen concentration camp. This project did not answer any research questions, but has served as a stepping stone for me to use for my capstone research paper, which has thus far involved reading through the trial transcripts of thirty- eight of the defendants at this Trial, as well as gathering information about the Nuremberg Trials at large and gender roles in Nazi Germany. I will construct an argument about the treatment of the women at this trial in my capstone paper and am currently working on compiling the research efficiently to begin on my argument. This is also new research, surprisingly these women have not really been discussed in scholarship at this point, and certainly not in a gender comparison like I'm trying to establish.

Human Rehabilitation

Post Traumatic Stress Disorder and Stigma-Related Barriers to Mental Health Treatment as Risk Factors for Iraq and Afghanistan War Veterans with Suicidality

Presenter(s): Andenmatten, Joseph

Faculty Sponsor(s): Ososkie, Joseph

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Suicidality refers to a range of suicidal tendencies including suicidal thoughts, behaviors, plans, attempts, and successful suicides. Post Traumatic Stress Disorder (PTSD) is the most prevalent mental health disorder among returning Iraq and Afghanistan War veterans seeking treatment from the Veterans Affairs (VA). Veterans with PTSD are at an increased risk of suicidality. Stigma-related barriers to mental health treatment provided by the VA include distrust in counseling professionals, lack of confidentiality, and fear of being seen as weak. These stigma-related barriers are more commonly found in veterans with PTSD than veterans without PTSD. This focused research review links the rate of suicidality among Iraq and Afghanistan War veterans with PTSD to stigma-related barriers to VA mental health treatment.

Interdisciplinary Studies

Native American retention: factors, programs and practices contributing to the completion of a four-year degree by Native American students in higher education

Presenter(s): Nirschl-Coats, Valerie

Faculty Sponsor(s): Franklin, Elizabeth

Research Excellence Award Finalist

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

This study examines the factors that contribute to the completion of a four-year degree among Native American students at a mid-size university in the Southwestern United States. In the United States Native American retention in higher education is at a low. Programs and practices have been implemented among universities to improve retention rates, but nonetheless retention rates are still minimal. Research in the field indicates that the factors contributing to Native American retention include familial support, support from faculty and staff, institutional commitment, and connections to homeland and culture. However, the research does not seem to show factors in relation to specific institutions. This qualitative study will focus on the experiences of six to twenty Native American students. These students will be interviewed to determine the factors that they regard as motives why Native Americans at this specific institution do or do not complete a four-year degree. Along with qualitative research this research will also be a program review in which the researcher will look at the University of Northern Colorado, Fort Lewis College, the University of Colorado at Boulder, the University of Colorado at Denver, Colorado State University, Duke University, and Baylor University. These programs will be evaluated through each individual program's website. Based on the program reviews and the responses from the students we will conduct thematic analysis to find trends.

Mathematics

Using Python to Mathematically Transform Simple Music: An Exploration of Computer Generated Music and Its Mathematical Connections

Presenter(s): Williamson, Heidi

Faculty Sponsor(s): Miller, Nathaniel

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The connections between mathematics and music are vast and are rarely given an adequate amount of attention. Some of the obvious correlations, such as note frequencies and electronically generated music, are explored through a musical manipulation program written in Python. Since mathematics forms the foundation for the basics of tonal theory, methods developed by Peter Westergaard are the primary techniques used in this program. Through segmentation, delay, or anticipation, the user may embellish and/or completely transform a melody starting with a few simple notes entered as a single pitch or as a two-tone chord. A simple starting place is to recreate a well-known melody by creating each note individually or using the various tonal theory methods as a means to familiarize the user with the program before transforming said melody into a completely new one. The program displays data entered via nested lists and provides playback by a wide collection of MIDI instruments and/or the generic WAV format. A composer may find this program a useful tool to produce an intriguing melody. There are many more mathematical techniques that will ultimately be implemented into this program to embellish or transform a melody. This program will not only benefit the music world, but the world of mathematics in presenting an uncommon application of simple logic within a field that is too often misconceived as unrelated.

Mexican American Studies

Cuban Success Reexamined: The Effects of Women's Role Changes and their Contributions to the Cuban Household.

Presenter(s): Correa, Norman

Faculty Sponsor(s): Suarez, Jose

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Scholars who have written on the Cuban success story tend to tell it from a man's perspective. By using only this voice, scholars overlook the differences between Cuban and American society for women, while neglecting the importance of gender in the transition experience. This mixed methods study examines how the role of Cuban women immigrants changed and how these

changes contribute to both family and individual success. Through interviews, this project will chronicle the experiences of Cuban women and their newly emerging roles. Findings indicated that when Cuban men came to the United States, they maintained the same role that they had in Cuba, while Cuban women reported more freedom, more access to education, and more opportunities to work outside the home. These differences let Cuban women contribute to the educational achievement of their children while providing additional income to the household.

Music

Improvisational therapy alleviates MPA symptoms in college wind musicians

Presenter(s): Rush, Shaina

Faculty Sponsor(s): Montemayor, Mark

Research Excellence Award Finalist

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Researchers have recognized musical performance anxiety (MPA) as a prominent disorder among musicians and have explored ways to cope with the resulting symptoms (Kirchner, 2004/2005). Methods such as pharmacotherapy, hypnotherapy, and cognitive behavioral therapy have been tested to treat individual symptoms of MPA, each with some measure of success. Music therapy is one of the most effective forms of therapy for stress, depression, and psychological disorders, all of which are affiliated with MPA (Martinez, 2009). However, music therapy as a treatment for MPA has been largely overlooked. This study will test if improvisational music therapy will reduce MPA symptoms (including state anxiety and trait anxiety symptoms) and improve self-esteem in music majors who play wind instruments. A secondary purpose of this study is to compare these data with those from a previous study involving pianists (Kim, 2005). Participants will freely improvise music (i.e., aside from their performance literature) for 15 minutes per day for six weeks, and will participate in a weekly group improvisation session; they will also keep journals so that they can track their own progress regarding anxiety symptoms. Anxiety levels will be measured through Likert-type scales about self-reported symptoms. Results may inform musicians and music teachers as to the benefits of these methods as a form of self-therapy for performing artists. Reducing anxiety through improvisational music therapy may provide for more rewarding experiences for performers and audiences, and may prove to be beneficial for musicians' careers.

Nursing

Comparison of Costs Between Warfarin and Xarelto for Anticoagulation Therapy in a Skilled Nursing and Long-term Care Facility

Presenter(s): Bronstein, Dennis

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Anticoagulation therapy can be a significant cost for long-term care facilities. Patients are typically treated with warfarin, which can require frequent laboratory work to ensure it is maintained at a therapeutic level. The lab tests can generate considerable costs for the facility. Xarelto is more expensive than warfarin, but patients taking it do not need to undergo the lab work. The purpose of this study was to evaluate the cost difference between using warfarin and Xarelto in a 139-bed skilled nursing and long-term care facility. The results of the study will be discussed and recommendations for policy change will be proposed.

Cost Analysis of Antecubital Vein IV Starts

Presenter(s): Feldman, Joan

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

COST ANALYSIS OF ANTECUBITAL VEIN IV STARTS

The purpose of this study is to evaluate the additional cost of restarting intravenous (IV) catheters in patients who were admitted to the floor through the emergency department (ED). This ED is part of a 130 bed hospital in Northern Colorado and it is common practice for ED nurses to initiate IV lines in the antecubital (AC) vein.

When an IV exists in the AC vein, any arm movement creates problems for the function of the catheter and it often becomes necessary to start a new IV. Chargeable items needed to restart an IV include an IV start kit, at least one IV catheter, 7 inch extension pressure tubing, buffered lidocaine, TB needle, and a 10ml flush of 0.9 % NS, at the minimum.

Best practice evidence suggests that IV lines not be started in the AC vein unless the patient is unstable, emergent, or heading to testing that requires large bore IV access (ie: spiral CT scan).

The purpose of this cost/benefit analysis was to assess the cost of restarting each of the AC IV lines that needed to be relocated. The costs of the necessary items were obtained from the managers of the purchasing and pharmacy departments.

The results of this research will be discussed. Policy implications and recommendations for change will be explored. The goal of this study is to offer best practice guidelines and education to ED staff with consideration of IV catheter placement in order to avoid incurring more cost to the hospital.

Cost Benefit Analysis Evaluating the Efficacy of Current Staffing Patterns.

Presenter(s): Skomp, Jessica

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Abstract

Purpose: To identify the cost efficacy of the current staffing patterns in a rural healthcare setting.

Problem: Current staffing patterns allows for one registered nurse to be on shift with the assistance of two certified nursing assistants, during the overnight hours. The shift runs from seven p.m. to seven a.m. and there is an on call nurse available for assistance if needed. If the on call nurse is called in to assist, he/she is then paid time and a half to work the amount of time needed to fulfill the gap. In this is a rural facility so there are no other personnel in the facility except the nursing staff at night. This cost analysis will provide a comparison of what would cost to staff an additional nurse, versus the on call nurse.

Methods: A retrospective approach was used for this study. A time period of three consecutive pay periods was analyzed to identify how many call in hours were paid. Then the nursing schedules for the correlating pay periods were analyzed to identify the reasons for the call in pay. During this research it was important to keep in mind that some call in pay is inevitable, for example: OB call in, traumas, or staff illness. This study focuses directly on the staffing pattern and how it contributes to the call in rates.

Results: Staffing patterns of this cost/benefit analysis will be discussed. Policy recommendations will be made.

The cost/benefit analysis for plastic graduated cylinder use versus using plastic drinking mugs at a Denver metro hospital Labor and Delivery unit

Presenter(s): Puricelli, Arian

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Abstract:

Plastic waste in the landfills is a critical issue in the United States. It was estimated that in 2010 there were 31 million tons of waste generated from plastic goods. Hospitals are a contributing factor to this enormous waste production. The purpose of this study was to assess the amount of waste and monetary costs of plastic graduated cylinders used at a 12-bed acute care hospital in the Denver area on the Labor & Delivery (L&D) unit. Per policy when a patient is admitted to the unit they are given a one-liter graduated cylinder to drink water. When the patient is transferred to the post-partum unit or high-risk perinatal unit they are given a large plastic drinking mug to keep for the remainder of their hospital stay as well as to take home. This retrospective study showed the Denver L&D was contributing to the plastic waste problem with an average of 700-800 plastic graduated cylinders per month in 2012. A cost-benefit analysis showed that the cost of one graduated cylinder is \$1.60 while the price of a reusable plastic drinking mug is \$1.37. By eliminating the plastic graduated cylinder provided to patients, this L&D would save an average of \$1,286 per month with an annual savings of over \$15,000 for the year of 2012. In addition to the fiscal benefits, L&D would decrease the amount of plastic waste produced by the hospital. Proposed recommendations for policy change will be discussed.

Cost Benefit Analysis of VIP Linen vs. Regular Hospital Linen for Women's Services

Presenter(s): Lujan, Tracy

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

In this day and age of cost cutting and tight budget monitoring, it is imperative to bring about awareness and conservation when using linen in the hospital to take care of patients. The women's service line at an acute care facility in Denver, Colorado implemented a new program offering VIP towels, wash cloths, and 300 thread count bed linen as a marketing and customer service opportunity. The purpose of this study is to meet the challenges that arise in keeping cost containment down, decrease unnecessary waste, and bring about awareness to staff and patients regarding the hefty cost to launder the items. Hospital laundry costs are calculated per pound used; however, when laundering VIP linen there is an additional \$0.35 per pound added to the total cost. The study was conducted and the findings revealed in 2012, before the hospital implemented the VIP program, the cost to launder regular towels, wash cloths and bed linen per patient was \$3.01. The VIP program was implemented in

January 2013 increasing linen costs per patient to \$6.91. With a simple change in process the cost per patient can be reduced to \$3.81 per patient. The cost still remains \$0.80 higher per patient than the figures for 2012; however, it supports the goals of customer and staff satisfaction, awareness, and ownership; and increases the marketing value behind the cost of laundering VIP linen.

Cost-Benefit Analysis of Oral Aprepitant in the Prevention of Post Operative Nausea and Vomiting

Presenter(s): Higgins, Jennifer

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Cost-Benefit Analysis of Oral Aprepitant in the Prevention of Post Operative Nausea and Vomiting

Nausea and vomiting are symptoms that are very disconcerting to patients. Studies have shown that post-operative nausea and vomiting, PONV, is the most common complication resulting from surgery. Aside from the unpleasant experience, it is costly to the patient and healthcare system. Post-operative nausea and vomiting costs millions of dollars every year to the healthcare system due to unplanned admissions from outpatient surgery, prolonged length of stay, and increased use of resources. A study was done to examine conventional treatments as well as newer, emerging standards. While there are many medications marketed for the treatment of post-operative nausea and vomiting, one medication, aprepitant, was found to be a promising in the prevention of symptoms. The purpose of this analysis is to determine if the benefits of the medication, measured in length of stay and/or prevention of unplanned admission, outweigh the cost of the drug to the hospital at approximately \$250 per dose. The analysis took place in a critical access hospital in rural Nebraska where the incidence of PONV mirrors the average found in literature of 30% of surgical patients. The patients were treated according to risk factors for PONV. Those who are found to be high risk were premedicated with aprepitant before surgery and then evaluated for symptoms of nausea and vomiting requiring additional treatment up to 48 hours post op. The analysis will be conducted for eight weeks and final results will be reported in April.

Cost Benefit Analysis: Recycleable Waste vs. Trash Collection

Presenter(s): Goshey, Tricia

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Hospitals produce large amounts of waste. These types of large organizations can have a significant impact on the community by recycling and reducing the amount of trash. Numerous benefits can result from an effective hospital recycling program. One of the many important reasons to recycle is cost. By diverting recyclables this can reduce the overall volume of waste a facility generates resulting in increased efficiency and cost reduction. On average, medical waste is five times more expensive to remove than solid waste. A prospective study was performed in a 12 bed intensive care unit (ICU) at a regional medical center. The purpose of this study was to establish what percentage of waste is recyclable and to determine the cost effectiveness of implementation of a recycling program. Waste was sorted into general waste and recyclables. Infectious waste was not determined recyclable for safety considerations. Hospital waste data was retrieved from the hospital's environmental services director. Number of occupied beds was also recorded and averaged. All ICU waste was weighed and classified as recyclable and general waste. Results will be discussed and reported as well as recommendations for development of ICU recycling initiatives.

The cost benefit of changing an office supply ordering policy

Presenter(s): Hall, Brook

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Financial burden is a leading problem facing our current healthcare system. Health care organizations are challenged to reduce costs without compromising patient safety and quality. The purpose of this study was to evaluate the cost benefit of a change of policy related to acquisition of office supplies on a 44 bed medical/surgical unit in an acute care setting. Specifically, the study compared the cost of office supplies when procured by a multi-team ordering system to the cost of office supplies when done by a single person ordering system over a month's time. Analysis of the data found that money can be saved when one person does all the ordering of office supplies on this unit. The findings demonstrate that a little change can make big impact on health care costs.

Cost-benefit of fixed fluoroscopy vs. mobile c-arm in a GI lab

Presenter(s): Adams, Les

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Background. Endoscopic retrograde cholangiopancreatography (ERCP) are complex procedures which require not only a skilled gastroenterologist but good quality radiological equipment. By utilizing quality equipment, better image quality can reduce fluoroscopy time, which in turn, will decrease radiation exposure to patients and staff. Objective. The purpose of this project is to evaluate the cost/benefit of a dedicated fixed fluoroscopy device with the mobile c-arm unit as well as compare the amount of radiation exposure of each delivery system. Methods. A literature review comparing radiation exposure from mobile c-arm units and fixed fluoroscopy devices was performed. A cost-benefit ratio was calculated with net present values and return on investment. Results. It is projected with the addition of a new fixed fluoroscopy device the GI lab could potentially increase the number of cases and reduce the amount of radiation exposure to patient and staff with no impact on quality care or safety. Final results will be presented at UNC research Day.

Cost Management: Energy Usage in Preop/PACU

Presenter(s): Bates, Cindy

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Energy usage in hospitals is considerable. Hospitals are among the largest energy consumers in the country. In aggregate, hospitals account for 5.5 percent of the total energy used by the commercial sector in 2007. This is up from 4.3 percent in 2003 (U.S. Energy Information Administration, 2012). An average hospital uses a disproportionate amount of energy per square foot when compared with other non-hospital commercial buildings. This is not surprising, given the unique nature of operations of hospitals; they operate 24 hours a day, and have unique energy intensive processes. Per square foot, an average U.S. hospital uses 27.5 kWh of electricity annually. Using an average commercial energy price of \$0.10 per kWh, this calculates out to an average cost of \$2.84 per square foot for electricity (E Source, 2010).

For the purpose of this cost management project, the hospital in question is small, community-owned, and nonprofit. The hospital has 78 beds, and is approximately 288,000 in square feet. The specific setting for the project is the Preoperative/PACU areas. The Preop/PACU area is composed of 3 pods—preoperative, PACU Phase I and PACU Phase II. In total, there are 16 beds within the 3 areas, with a connecting nurse station. The Preop/PACU area is not a 24-hour/day unit, and cases are typically done by 6 pm on the weekdays. Only emergent/emergency cases are done at night or on the weekends. Currently, it is not part of the standard work-flow to shut off lights, monitors, and other appliances that are not in use at the end of the day. Using standard energy consumption rates, calculations will be made that approximate the savings that can be achieved simply through implementing a “closing” routine at the end of the day. The results will be discussed as well as recommendations for cost savings.

The Energizer Bunny - Is Longer Better

Presenter(s): Brown, Heather

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The Energizer Bunny – Is Longer Better

The importance of continuous cardiac monitoring of patients in an acute inpatient setting has been supported through research and practice. Creation of a telemetry monitoring program that allows continuous monitoring of these patients while managing the many issues this process is presented with is a struggle on telemetry units across the healthcare system. Challenges include dislodged leads, alarm fatigue for the provider, cost and lapses in continuous monitoring leading to state reportable situations. Studies show that the most common reasons for lapses in continuous monitoring are accidental dislodgment of the telemetry leads by the patient and batteries dying leading to loss of signal. Battery death is an avoidable loss of signal that many facilities have dealt with by implementing a strategy of battery exchange, the current battery for a new battery, on a routine basis independent of when the telemetry monitoring was started on a particular patient. The purpose of this study is to specifically look at the cost associated with routine exchanges versus exchanges based on life of the battery. The study will look at the possible cost savings while eliminating the loss of power of a monitor associated with a dead battery. This study took place on a 44 bed telemetry unit in a community hospital that averages 31 cardiac monitored patients every day. Results of this study will be presented during the UNC Research Day.

How well did you 'Scrub the Hub?' A cost benefit analysis

Presenter(s): Soliman, Annie

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Hospitalized patients with central venous catheters are at high risk for central line acquired bloodstream infections (CLABSI). Current guidelines call for nurses to “scrub the hub” for 15 seconds, then to allow for a 30-60 second dry time. Audits of central line care have shown that nurses are not vigilant about catheter care, including scrubbing the hub. A new line of products has been introduced in recent years: alcohol saturated port protectors. One such product is the Curois disinfecting port protector. Studies have shown that this product has decreased the incidence of CLABSI by

86%. In a cost benefit analysis for a 420 bed hospital in Denver Colorado, the cost savings of using the cap on all central lines versus the yearly cost of treating an average number of central line associated blood stream infections results in a cost benefit to the facility.

Impact of Nursing Residency Programs on Nurse Retention

Presenter(s): Buss, Lisa

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Nursing attrition is a major issue with which the healthcare industry must contend. At some hospitals, the turnover among newly graduated nurses has been reported as high as 60% in during first year. Financial analysts have calculated the cost of replacing a nurse to be twice the nurse's annual salary as dictated by local market values. Furthermore, these same analysts calculated that for every percentage point increase in the overall turnover rate, the average hospital is said to lose an additional \$300,000 per year. Nurse residency programs were developed to ease newly graduated nurses from school to competency in the workplace setting and in an attempt to increase retention rates. The intent of this inquiry is to ascertain the effectiveness of nurse residency programs as a retention tool. The methods used will include a review of the literature into similar research inquiries as well as data collection from a newly organized and implemented program comparing retention rates before the residency program was instituted versus retention rates after the residency program was instituted.

Intravenous Fluid stop times in the Emergency Department

Presenter(s): Perkins, Ramona

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Abstract

In 2011 a Northern Colorado Health Care System embarked on a LEAN journey. LEAN methodology involves decreasing non-value added steps for the consumer or patient. The Emergency Departments of the health care system were identified as departments where processes existed that did not benefit the patient. In a rapid improvement event involving the emergency and coding departments, lost revenue was evaluated from lack of documentation of IV fluid end times. The staff of the emergency department was found to be non-compliant with documenting IV infusion end times approximately forty one percent of the time. Data was collected comparing the number of provider orders for IV fluid and the number of emergency department staff who documented the time IV infusion stopped. In order for hospitals to bill the patient or insurance company there are three pieces of information that must be documented; a provider order, infusion start time and infusion end time. Initial data from three months prior to the rapid improvement event revealed a total of 882 orders for IV fluid with 60% without a stop time from emergency department staff, resulting in \$162,534.00 lost revenue. An additional documentation screen was developed for the electronic health record. Education was provided to the emergency department staff on the importance of documenting IV fluid stop times using the new input and output screen. Once education of emergency department staff was complete, the percentage of complete documentation on IV fluid improved, leading to increased revenue from IV infusions. Results from the cost benefit analysis will be provided.

Minimizing Hospital Supply Costs: A Cost-Benefit Analysis

Presenter(s): Bishop, Laura

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

MINIMIZING HOSPITAL SUPPLY COSTS: A COST-BENEFIT ANALYSIS

Abstract

The entire U.S. healthcare industry accounts for 16-17 per cent, approximately \$1.9 trillion dollars gross domestic product (GDP). Of that, hospital costs comprise 30 per cent. Supplies are the second largest expense for hospitals after salaries, and account for 18 per cent of operating expenses (Chandra, Kumar, & Ghildayal, 2011). The purpose of this analysis is to provide evidence for the overall annual cost savings in a 35 bed Long-Term Acute Care facility by implementing change of practice by hiring a second supply manager and pre-packaging wound supplies most commonly needed for wound care. Wound care is imperative for the majority of the patients in our LTAC facility. Based on the current calculations, in the month of January 2013 wound care supplies were \$5,000 over budget. The average annual salary of a supply manager is \$30,000 I will conduct a cost-benefit analysis comparing the cost of hiring a supply manager and annual savings of wound supplies Recommendation for change in procedure is to hire a supply manager to prepare wound care supply packages with itemized charge slips. This change will reveal over a 12 month period, the anticipated savings of \$30,000.

MRSA Screening: A Cost-Benefit Analysis

Presenter(s): Hoffman, Cynthia

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The incidence of infections caused by antimicrobial-resistant pathogens including Methicillin Resistant Staphylococcus Aureus (MRSA) has increased dramatically over the past 20 years. MRSA infections are associated with greater lengths of stay, higher mortality, and increased healthcare costs. Based on the Centers for Disease Control and Prevention (CDC) approximately 126,000 persons are hospitalized each year with MRSA infections and about 19,000 die. Researchers estimate the annual cost to U.S. hospitals to be \$3.2 billion to \$4.2 billion. The researchers found the direct medical cost to range from \$27,083 to \$34,900 per case. The purpose of this study is to determine if the common practice of screening all patients upon admission to the Multi-Trauma unit of a 368-bed hospital and placing all patients who test positive on isolation precautions is a cost-effective method in preventing the spread of MRSA infections. Results of this cost/benefit analysis will be discussed as well as policy recommendations.

Needleless System in the Hospital Setting

Presenter(s): Sullivan, Jenny

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Jennifer Sullivan

Abstract

Following the passage of the Needlestick Safety and Prevention Act by Congress in 2001, many hospitals have adopted the use of additional needle safety devices to prevent exposure of healthcare workers to blood born pathogens through sharps related injuries. This act mandates that employers consider the use of safety devices that would eliminate or minimize exposure to hazards related to blood born pathogens. "Employers must select devices that, based on reasonable judgment will not jeopardize patient or employee safety or be medically inadvisable; and will make an exposure incident involving a contaminated sharp less likely to occur (United, 2001). The purpose of this project is to evaluate the cost of using plastic blunt tipped needles in place of conventional metal needles in an acute care setting. This project aims to evaluate needles used for drawing up and mixing medications and does not evaluate use of blunt suture needles or other blunt tipped needles intended for direct contact with patients. It is understood that there is still a need for metal sharps for certain tasks and this project simply seeks to eliminate their use when it is not absolutely necessary. The price of each individual product was compared one to one as well as the price of proper disposal of metal sharps. Sharps disposal is a consideration because plastic blunt tipped needles can be disposed of in the trash. The metal needles currently in use cost \$0.17 and \$0.20 each and the blunt tipped plastic needles cost \$0.12 each. Data regarding the number of needles used annually as well as the cost of sharps disposal is still being collected and will be reported with the final results. Additional savings may be found with fewer sharps related injuries and subsequently money saved in treatment of exposure.

Protecting our Backs: A cost benefit analysis of installing overhead patient lifts vs. worker's compensation claims

Presenter(s): Bennett, Lindsay

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Protecting our Backs

Introduction: Traditionally, education and training in body mechanics and lifting techniques were the most common approach for the prevention of back injuries among health care workers. However these techniques alone have failed to protect health care workers from injuries. According to the American Nurses Association (ANA) research today states there truly is no safe way manually lift physically dependent adult patients. Health care providers are at increasing risk for back injuries due to increasing rates obesity, repetitive movements with patient handling, and higher patient acuity levels. It is estimated that 52% of nurses complain of chronic back pain and injuries (Hunter, Branson, & Davenport, 2010). The average back injury cost the hospital anywhere from \$15,000 to \$25,000 dollars in direct and hidden cost. Objective: A cost benefit analysis was performed evaluating the cost of installing overhead lifts in a twelve bed intermediate care unit to determine if the return of investment (RIO) would be seen through a reduction in worker's compensation claims. Method: The initial cost of installing the lifts and purchasing slings were compared to the cost accrued through workman compensation claims from back-related injuries reported through an acute care hospital. The initial installation of the LIKORALL lift cost \$7,500/lift with an additional \$300/sling, these costs will be multiplied by 12 to determine the total cost of adding over head lifts to the intermediate care unit. The total cost will than be compared to worker's compensation claims for one year with total cost saving on worker's compensation claims projected to multiple years. Results: conclusion and results are pending and will be presented during poster presentation.

Reusable biopsy forceps: Are they cost effective?

Presenter(s): Lewan, Shea

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Hospitals generate waste each year in their operating rooms (OR), from disposable gowns and gloves to disposable surgical instruments. A report from Practice Green Health (2011) discovered that hospitals in the United States produce more than 6,600 tons of waste per day which amounts to over 4 billion pounds annually much of which comes from operating rooms. This waste can be reduced, saving the hospital money as well as helping with the environment. According to Environmental Health Perspectives (2012) 25% of U.S. hospitals reprocess single-use OR devices saving hospitals more than \$138 million and diverting 2,150 tons of waste from landfills in a single year. In Academic Medicine (2010) researchers at Johns Hopkins explained that recycling medical equipment saves money, reduces waste and is safe. Any hospital facing a declining budget and searching for ways to reduce costs, while maintaining sound medical standards, could save money every year by using reprocessed, sterilized equipment rather than disposable. One acute care facility along the Front Range with 114 beds is evaluating the costs of used disposable forceps vs. the costs of reusable biopsy forceps to determine if the cost benefit will be significant enough to revise policy and procedures relative to equipment used during surgery and procedures. This project will examine the costs over the past year (2012) of the disposable biopsy forceps currently being used in the GI Lab at this acute care hospital and compare those costs to the cost of switching to reusable biopsy forceps to determine if the annual savings and the reduced waste will be significant enough to change the current policy at this acute care hospital. Some hospitals that had made this change have found significant savings financially and in reduced waste.

SAFETY MEASURE

Presenter(s): Joder, Chris

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

SAFETY MEASURE

The cost effectiveness and benefit analysis of a urimeter urinary retention catheter (UURC) being the sole product for patients use in the acute care hospital setting is the most universally relevant in all phases of hospitalization when compared to the non-urimeter urinary retention catheter. From critical care to discharge, the usage of the urinary retention catheter (URC) is widespread. The recent attention by Joint Commission on Accreditation of Health Care Organizations (JCAHO) to preventing catheter associated urinary tract infections (CAUTI) has brought focus to the correct use and proper function of the URC. The 2013 National Patient Safety Goal (NPSG) 07.06.01 states: "Use proven guidelines to prevent infections of the urinary tract that are caused by catheters". This analysis is evaluated in a 137 bed hospital to determine the rates of usage of the URC among all phases of a patients hospitalization. The data looks at total number of catheter utilization days in a 137 bed hospital from 2010 through 2012 and compares the data to the National Healthcare Safety Network (NHSN) standards. The research also looks at both products usage in relationship to the efficacy of infection prevention. The results are expected to reveal the use of the non-urimeter URC is obsolete in meeting the JCAHO NPSG related to prevention of CAUTI. The results are also expected to reveal product usage re-education/validation for increasing RN awareness and proper product usage for decreasing infection rates within NHSN standards.

Save cash by using white trash (bags)

Presenter(s): Holthouser, Jodi

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

BACKGROUND: An operating room (OR) consisting of 13 OR suites, averaging 30 surgical cases/day disposes an average of three bags of trash per case. Two of the three bags are red trash and one is white trash. Incineration of red trash is mandatory due to containment of hazardous materials. Current OR practice is to dispose most trash into the red bags regardless of hazardous material saturation. In order to change current OR practice of utilizing two red trash bags and one white trash bag per room, a cost/benefit analysis was performed to flip the ratio and use one red bag and two white bags per surgical suite. **METHODS:** This analysis was accomplished by obtaining the average weight of each trash bag and multiplying the cost per bag by the amount of cases performed per day. **RESULTS:** The average trash bag weighs 10 pounds, two red bags per case equal 20 pounds X average of 30 cases per day X 0.47 (cost) = \$282.00 X 365 days per year = 102,930.00 annually. One white trash bag also has an average weight of 10 pounds X 30 cases per day X 0.19 (cost) = \$57.00 X 365 days per year = \$20,805.00 annually. By changing the ratio to using one white bag and two red bags per OR suite, a savings of \$30,660.00 annually would be obtained. **CONCLUSION:** Significant savings is achieved by changing the standard of practice of disposal of OR materials while abiding by the current Association of PeriOperative Registered Nurses (AORN) standards. Implications to this change in practice include improper disposal of hazardous materials resulting in substantial fines from the land fill and education/compliance of OR staff and surgeons to the new standard of OR waste disposal.

Urinary Catheter Use: A Cost/Benefit Analysis

Presenter(s): Sampson, James

Faculty Sponsor(s): Hummel, Faye

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Background. Catheter Associated Urinary Tract Infection (CAUTI) is among the most prevalent Hospital Acquired Infections (HAI) in the United States with more than 500,000 occurrences annually (Oman et al. 2010). Accordingly, CAUTI are costly for health care facilities considering the impact of regulations established by the Center for Medicare and Medicaid Services (CMS) governing the reimbursement of hospital services. The Deficit Reduction Act of 2005 prompted the CMS to identify frequent, costly and preventable conditions that were secondary to hospitalization. The CMS would subsequently, deny claims issued after October 1, 2008 for 10 hospital acquired infections including CAUTI. Additionally, CMS would prohibit hospitals from billing the patient the difference between the Medicare reimbursement and the total amount of the claim placing the onus on the hospital to make improvements to the quality and cost of care provided.

Objective. An analysis of the CAUTI mitigation strategies currently in place at a community hospital as compared with evidence based standards to determine the actual and potential cost of the use of urinary catheters. An evaluation of the effectiveness of current CAUTI mitigation protocols and what, if any additional measures can be implemented to maximize Medicare or Medicaid reimbursement specific to the use of urinary catheters.

Method. A literature review to determine the mitigation strategies and policies used to reduce CAUTI and to determine cost effective strategies for implementation in a small community hospital. An analysis of the instruments and or current policies and practices used to prevent unnecessary or prolonged use of urinary catheters as well as missed documentation contributing to reduced Medicare reimbursement.

Results. To be determined and presented in a poster presentation at the UNC Research Day, April 11, 2013.

Nutrition

The Impact of Residence on Dietary Intake, Food Insecurity, and Eating Behavior Among University Undergraduate Students

Presenter(s): Gonzales, Kittra

Faculty Sponsor(s): Gould, Susan

Research Excellence Award Finalist

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

University students are overlooked as a nutritionally at-risk population in regards to poor dietary intake, food insecurity, and eating behavior. The purpose of this study is to determine if residence has an impact on university students' dietary intakes, which residence type (on-campus or off-campus) meets recommendations more closely, and investigate socioeconomic and behavioral factors related to poor dietary intake. A cross-sectional, online Qualtrics survey was designed and distributed to University of Northern Colorado students. The survey includes an original food frequency questionnaire (FFQ) designed according to ChooseMyPlate.gov dietary intake recommendations and the U.S. Adult Food Security Survey Module (AFSSM) developed by the US Department of Agriculture. Responses about eating behavior and demographic characteristics, such as gender and age will be analyzed. Chi-square and independent t-test analyses will be used to determine significant differences in the variables between residence type and gender. This study addresses knowledge gaps between newly updated nutrition guidelines and student lifestyle by incorporating an innovative approach to study design and methodology commonly used in nutrition research.

Physical Education

Trends in Physical Education Identified by Professionals in the Field

Presenter(s): Nampai, Udon

Faculty Sponsor(s): Sinclair, Christina

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Through interviews, the author aims to investigate beliefs, perspectives, and opinions of experts and experienced teachers in the field of physical education. Three professionals who are certified elementary physical education teachers with at least 3 years of physical education teaching experience in elementary school district in the U.S. were interviewed. Data were collected through

semi-structured interviews; interviews were approximately 45 minutes long. Data were analyzed using a thematic coding method to examine the common themes emerging from the analysis. Preliminary findings include: foundation of basic skills, integration activities from the general education classroom, keeping body healthy and providing health education, and amount of time in physical education class.

Physics

Beyond Your Lifetime: Relativities' Effect on Muon Flux at Various Elevations

Presenter(s): Day, Travis; Gasteiger, Joseph; Tonye Tonye, Herve

Faculty Sponsor(s): Dietz, Richard

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Muons, produced through high energy interactions with cosmic rays in the Earth's upper atmosphere, form an abundant source of subatomic "clocks" moving at velocities near the speed of light. As an effect of these velocities, the muon flux does not behave according to classical mechanics; rather, these particles behave relativistically. This phenomenon allows these particles to travel to lower elevations and experience a longer lifetime in the Earth's frame of reference. Measurements of muon flux taken in Greeley, CO and Berthoud Pass, CO provided an elevation difference of approximately 2,000 meters. The difference in muon flux, at these elevations, is consistent with the predictions of time dilation in special relativity.

Bouncing Back: Energy Loss in Wooden Block Collisions

Presenter(s): Champion, Steven; Hafen, Zachary; Pausa, Bronson; Smith, Tyler

Faculty Sponsor(s): Dietz, Richard

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Collisions occur all around us every day. Unfortunately, many complications arise when smashing objects into each other. We took a simple approach to modeling these interactions by measuring the coefficient of restitution (COR) using a high-speed camera. The COR allows us to measure the total energy loss within the system after the event occurred. The specific system we examined was wooden block impacts. We measured the COR for multiple impact-types within the system. Each COR is specific to an impact-type. The COR(s) we measured could further be applied to more complex collision systems with the same impact-types.

The STM: High Resolution Images of Atoms

Presenter(s): Pacheco, Richard

Faculty Sponsor(s): Sung, Ruwang

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Ever since the idea of the atom was introduced people have wondered what something so small could look like. With the aid of the STM we have been able to do just that! I investigated the structure of a sample on the atomic scale to gain insight into this tiny world. As part of the UNC ENSER group I used the STM to image samples of HOPG (Highly Ordered Pyrolytic Graphite), Gold (Au 111), and a sample of Gold in a polycrystalline grain structure. By looking at the material at the atomic level we can better understand that how the structure of the atoms affects the material. The aim of using the STM here at UNC was to be able to understand how the nanoparticles known as Quantum Dots arrange themselves on the atomic level after being applied to a material. Since semi-conducting Quantum Dots have applications to next generation thin-film solar cells, understanding the arrangement of the Quantum Dots might well lead to an increase in efficiency for the next generation of solar cells. Therefore, the STM is an indispensable tool for gaining a better understanding of how the small can affect the large.

Psychology

The Effect of Congruency Between Perceiver and Target on Emotional Recognition

Presenter(s): Trimble, Kyra

Faculty Sponsor(s): Peterson, Eric

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Several number of meta-analyses has demonstrated that women are more accurate at reading emotions, than men. Many studies have demonstrated that women are relatively better at reading nonverbal behavior of other women, compared to the ability of

men to read other men. In other words, while women, on average, typically outperform men in tasks involving nonverbal behavior they also do relatively better at reading other women whereas men do not show this gender congruency effect. We are exploring this effect of congruency between target and perceiver in reading nonverbal behavior. Four tasks will be used involving reading nonverbal behavior. The first two tasks involve glean nonverbal behavior information from somewhat natural displays (e.g. a person talking). The Diagnostic Accuracy of Nonverbal Analysis (DANVA) involves choosing which basic emotion matches either static adult or child faces or voice clips (e.g. happy, sad, surprised, and fearful). The Profile of Nonverbal Accuracy (PONS) involves watching short clips of a woman talking in a blurred voice or speaking without sound and choosing among two alternatives (e.g. "showing jealous anger verses looking at nature") that best fit the situation. Unlike the PONS and DANVA, our next two tasks, the Emotional Bias Task and they do not depict individuals engaging in a natural behavior. Rather, these tasks involve making emotion judgments from faces on a computer screen. For both tasks, emotion stimuli were created by blending neutral faces with each basic emotion to create stimuli across a range of intensities. The Emotion Bias and Sensory Threshold tasks provide a more precise index of ones ability to detect emotions that either the PONS or the DANVA. In addition to testing for both an overall female superiority across our tasks and a gender congruency effect we will explore the degree to which performance across these tasks is correlated.

Gender Differences in the Gym

Presenter(s): Hood, Kayla

Faculty Sponsor(s): Traxler, Karen

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

It is commonly seen in the gym that more females than males use automatic machines, or fixed weights, as their choice of exercise. This phenomenon of gender preference has inspired this observational study to see if there is a correlation between gender and exercise equipment choice. We observed males and females using either automatic machines or free weight equipment at the University of Northern Colorado Recreation Center. The purpose of this study was to support our hypothesis that more women will use the automatic machines for their source of exercise compared to men, and that more men will use the free weight equipment as their choice of staying fit. This study has the potential to observe how gender affects exercise choices and opens the door for more research on how each gender can receive the same benefits without breaking society's gender roles. Our research question is to see whether there is a gender bias in a gym setting. With a total of 269 participants, 210 being males and 59 being female, we found by observing at various times throughout the week that there was a significant difference between in the proportion of males and females in their choice of exercise equipment with males outnumbering females. With a $\alpha = .05$. $r(269) = .395$, $p < .0001$ there is a suggestion of a strong positive correlation between gender and exercise equipment used in the recreation center. Based on the results of this study there could be multiple explanations for this occurrence even though this experiment cannot clarify this display of gender roles in the gym.

Social Deviance and Gender Stereotypes

Presenter(s): Gonzales, Hannah

Faculty Sponsor(s): Traxler, Karen

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The root cause of deviant behavior is society putting in place social norms and how the individual responds in frustration and a lack of control (Cloward, R. and Piven, F). A rule is something that people are supposed to follow and breaking this rule is a form of deviant behavior. The focus of our observational study was to investigate gender and deviant behavior. Our hypothesis was that women were more likely to open the box due to their natural curiosity. By placing a box in the Starbucks Coffee Shop located at the University Center at UNC on which a sign was placed that read: "do not open me". Several researchers sat nearby to observe the customer's behavior in regards to the box. From our vantage point we were able to observe the customers behavior and who was willing to break the rules and open the box. We conducted a Person's Product Moment Correlation and the results showed that women were significantly more likely to break the rules than men, which did support our hypothesis.

Key Words: deviant behavior, gender

Public Health

Master in Public Health Student Poster presentations

Presenter(s): Ford, Shelly; Groesbeck, Corrie; Sharp, Teresa; Sheppard, Shannon; Skenadore, Amanda; Carroll, Danya; Madsen, Matthew

Faculty Sponsor(s): Sharp, Teresa

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Please see abstracts listed in the Oral Abstract Section.

Sociology

Discovering the Benefits of a Factitious Disorder

Presenter(s): Hope, Ashleigh; Wolfe, Erin; Hyland, Samantha; Rathbun, Jennifer

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Factitious disorders are mental disorders in which an individual deliberately produces or exaggerates symptoms of a physical or mental illness he or she does not have. In investigating factitious disorders, there is little focus on the direct benefits an individual gains when striving to be ill. We aim to analyze the direct and indirect positive consequences of factitious disorders in order to propose successful treatment plans for individuals with the disorder. By identifying the gains factitious disorders allow individuals, we can further understand this illness and the intentions people with the disorder have in perpetuating a consciously created condition.

Frustrations among Staff and Residents at a Homeless Shelter

Presenter(s): Flores, Giovanni

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

What are homeless shelters like? Is a shelter's purpose just for those we see on the side of the road panhandling? From my internship at the Greeley Guadalupe Shelter, I have found that many of the residents do have jobs and are not as hopeless as society perceives them to be. I have found that once in the shelter, residents face a levels program that is in play to help them when they leave the shelter. This program can cause frustrations between the staff and residents, and my research involves studying what these frustrations are. In order to understand the source of the tensions found in homeless shelters, interviews will be conducted with residents and staff asking questions about their life in and out of the shelter, along with what is holding residents back from graduating to self-sustainability. With a clearer understanding of the challenges faced in running a homeless shelter, I believe that the residents could be given better tools to function within society. Along these same lines, knowing what irritations the staff encounters in their interactions with residents could provide the opportunity for a smoother operating shelter. I propose that when both residents and staff understand where these frustrations come from, that there would be a higher success rate among residents and fewer residents who leave and return.

Improving Greeley's Public Transportation

Presenter(s): Dekraai, Elise

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The central purpose of my project is to improve communication between the community's needs and Greeley Transit. I will focus on the public transportation existing and available to lower income neighborhoods in Greeley. I also will focus attention on UNC students and look at how bus service can be improved on and around the campus area. I plan to accomplish this by passing out surveys to passengers and clients of Greeley Transit on public city buses, UNC buses and in UNC classrooms (students). What I essentially want to discover is what changes can be made to effectively help lower income citizens of Greeley get the necessary help to transport them to areas of town they need to get to. I will collect surveys, review responses and use statistical data to inform Greeley Transit of areas that are in need of improvement. I will also evaluate current routes to lower income areas to see if they serve neighborhoods where need is higher or if indeed the need for more public transport truly exists. My anticipated conclusion will be that there are needs of citizens that are not being met and making route changes or having more bus stops will cause an overall higher satisfactory rate.

Mental Illness in LGBTQ

Presenter(s): Prouty, Ashley; Halley, Tamra; Escarcega, Jon; Hansen, Brittany

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The primary purpose of this research is to analyze the ways in which social norms affect the mental health of Lesbian, Gay, Bisexual, Transgender, and Queer (LGBTQ) individuals. The majority of the research and findings for the project will be from a review of the literature on the sociological study of the LGBTQ community. Historically homosexuality has been classified as a mental illness; however research findings have disproved this medical opinion. Despite the scientific evident, homosexuality remains viewed as sociologically deviant. The anticipated conclusion of our research is that prejudice and discrimination against the LGBTQ community causes an increase in mental illness.

Schizophrenia: Japan vs. U.S.A.

Presenter(s): Cordero, Chelsea; Tubbs, Naomi

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The general focus of this research is a cross-cultural comparison of schizophrenia. More specifically, we compare and contrast differences between the United States and Japan, in the way each country defines schizophrenia, their social view of schizophrenia, and their evaluations of the way schizophrenia is viewed in their counterpart. Additionally, we evaluate the role social density affects opportunities for treatment and/or the out-sourcing of care. Finally, we compare the social norms and values of each culture and if and how these play in the onset and treatment of illness.

Socialization Ability of Feral Children

Presenter(s): Huerta, Bobbie; Perez, Jazmin; Rich, Stephanie

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Although feral children, those children that are locked away in attics or basements from the time of birth/infancy until their discovery, are a rare occurrence, they are a sociological phenomena that are overlooked. This presentation will look at whether or not feral children can be socialized after the "critical" socialization point of the average child. Our research is a compilation of researches that came before us and our interpretation of their work to fit into our research purposes. We have found that it is possible for feral children to be socialized if they have people in their lives (both professionals and those that comprise a support system) who are willing to work with them by means of intensive therapy, education, and supervised interactions with other children.

The Sociology of the Insanity Defense

Presenter(s): Gerardi, Genae; Mahleres, Noelle; Trevino, Audrey; Vongphachanh, Debbie

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Our research is a sociological exploration of what is usually considered a legal term--the 'insanity defense.' From a sociological viewpoint, we will be focusing on how people view individuals that use the insanity defense in trial, as well as how individuals that 'get off' using the insanity defense are treated by society after the trial. To gather this research we will be focusing on several trials in which the insanity defense was pertinent to the outcome; for example the trials of James Holmes and Andrea Yates. We will evaluate their treatment during the trial as well as their social reputation afterwards. We hypothesize that society automatically stigmatizes those who invoke the insanity defense, no matter the outcome of the trial, due to the societal label that is invoked when they pleaded this way in the first place.

Suicide

Presenter(s): Schrader, Maelee; Hernandez, Teresa; Graf, Shantell

Faculty Sponsor(s): Houser, Jeffrey

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

In certain groups of people, suicide rates rise. These groups include incarcerated individuals, gay individuals, and military personnel. High suicide rates in these groups follow Durkheim's theory of suicide of extremes in integration and regulation. These particular groups in society are isolated, causing problems with integration, social connections, and ability to perform daily functions. Individuals who have these problems sometimes resort to extreme measure such as suicide. To lower suicide rates, help should be more readily available and society should find ways to help people before they get to the point of taking their own lives.

Special Education

Exploring the needs of mothers of adults with disabilities in Saudi Arabia: A pilot study

Presenter(s): AlRusaiyes, Reem

Faculty Sponsor(s): Jackson, Lewis

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The purpose of this qualitative research was to explore the educational and skills needs of adults with intellectual disabilities (14-21 years old) from their mothers' perspectives. The participants were three Saudi mother of adult with intellectual disabilities. Participants were interviewed individually in their home environments. The results showed some concerns that mothers expressed about their adults' future and about the services provided and services needed by their adult children.

Influence of Peer Buddy Program Intervention for Adolescents with Disabilities in High School Setting: Impact on Social and Academic Achievement

Presenter(s): AlQahtani, Ragea;

Faculty Sponsor(s): Murry, Francie

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The purpose of this study was to examine the perceptions and academic/social gains of high school students with learning disabilities and/or emotional disabilities in a Peer Buddy Program. This study used a mixed research design. Qualitative analyses was conducted on students structured interviews focused on their perceptions about the program effectiveness. Quantitative analyses was conducted on student archival school files information of general education content course grades, information special education assessments for language arts, math, and reading. In addition, data from the Social Skills Improvement Scale (Gresham, 2002) was examined using a paired samples t-test from students, special and general education teachers. Results from archival school files, students and special education teachers were statistically significant for academic and social skills improvement. Provided are suggestions for future activities and training for peer buddies in the program, and recommendations for further research.

Parents' Perspectives of Special Education Services for Students with Significant Support Needs

Presenter(s): Shugdar, Effat

Faculty Sponsor(s): Brewer, Robin

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Some parents believe that middle school special education services for students with significant support needs (SSN) are not adequate and others believe that some services are unavailable. Parents would like to suggest the type and amount of services for their children. This case study used dialoguing opportunities with parents to discuss their point of view about their child's special education services. The following questions direct this study:

- a. How do parents describe the services for their child with SSN and their families at the middle school level?
- b. What are parents' perspectives on the appropriateness and the amount of the services for their child with SSN at the middle school level?
- c. How do parents contribute in making the decision about the types and amount of services to their child with SSN?

This study will focus on three parents' perspectives from school districts in Northern Colorado. Parents were interviewed face-to-face to discuss the adequateness of services provided to their children 12-14 years old with SSN. Following the interviews, all recordings were transcribed to allow for analysis. Through this analysis specific themes were identified based on the four major elements of the Transition Theory (i.e., situation, self, support and strategies) (Summers, 2002). Also, analyzing the interview data led to a better understanding of the nature and adequateness of the services provided. Furthermore, a rich thick description of the level of parents' satisfaction provides a picture of parents' demands and overall beliefs of the strengths and weaknesses regarding the current services. The results of this study provide insights about how schools can improve collaboration with parents when determining the services for students with SSN and ways to increase parents' participation and contributions when making these decisions. Also, helping parents to understand and aware of the appropriate services provided for their children.

Sport & Exercise Science

Aging downregulates MRPs and increases EDL doxorubicin accumulation

Presenter(s): Pfannenstiel, Keith

Faculty Sponsor(s): Hayward, Reid

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Longs Peak

Doxorubicin (DOX) is an anthracycline currently used to treat a large number of human cancers. Multidrug resistant protein-2, and -7 (MRP-2, -7) are known to extrude DOX and may factor into the degree of intramuscular DOX accumulation. The purpose of this study was to examine age-related differences in skeletal muscle MRP expression and DOX accumulation. Female Sprague-Dawley rats were randomly selected to receive a 15 mg DOX/kg body weight (i.p.) at 4, 12, 16, 20 or 24 weeks of age. Animals were sacrificed 24 hours following injection and the soleus (SOL) and extensor digitorum longus (EDL) excised. High performance liquid chromatography was utilized to quantify DOX and Western blotting to analyze MRP expression. No significant differences were seen in DOX accumulation in the SOL. DOX accumulation in the EDL was lowest in 4-week (223±139 ng DOX/g EDL) and was significantly increased ($p<0.05$) at 24-weeks (490±194 ng DOX/g EDL). Other significant increases ($p<0.05$) were

seen between 12-week (225±45 ng DOX/g EDL) and 24-week as well as 16-week (257±96 ng DOX/g EDL) and 24-week. A significant down-regulation ($p<0.05$) of MRP-2 and MRP-7 expression in the EDL was seen with increase age. No significant down-regulation of either MRP expression was seen in the SOL. These data suggest that MRP-2 and MRP-7 expression may play a role with increased intramuscular DOX accumulation of the EDL with age.

AN INVESTIGATION OF STUDENT NON-ATTENDANCE AT FCS FOOTBALL GAMES

Presenter(s): Mayer, K.C.; Davies, Melissa; Zaharia, Noni;

Faculty Sponsor(s): Mayer, Kurt

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

The purpose of this study was to explore why current and potential student spectators are not attending FCS football games. A survey was utilized to measure the impact of 13 factors (39 total variables) on non-attendance of a mountain west university. Two logistic regressions were conducted to predict factors of non-attendance, one for the most recently completed season, and another for the entire time frame the student has been enrolled at the university. The results indicate non-attendance predictors of the past season for participants who did not attend a game included Additional Commitments, No Interest, and Facility, while non-attendance of students who had attended a game this past season included Weather and Lack of Someone to Attend With. The second model predicted non-attendance for participants who had never attended a game were similar to the first model with No Interest and Facility, while also having Financial Cost as a predictor. Non-attendance for participants who had attended a game during their enrollment included Weather and of Lack of Success. These findings should be utilized to help develop marketing strategies to improve game attendance, specifically in transforming non-attendees to attendees, as well as in retaining and increasing consumption of current attendees.

Measuring Sport Team Brand Personality: Scale Validation

Presenter(s): Must, Emily

Faculty Sponsor(s): Gray, Dianna

Graduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

One of the more salient tasks for a sport marketer is to develop brand equity through the differentiation of the team's brand within an oversaturated sport and entertainment market. Part of brand equity is the component of brand personality which involves associating the brand with human-like traits to which consumers can relate (Aaker, 1997). While brand personality measures have been found effective within traditional business literature, those same measures have not effectively captured the sport brand personality (Ross, 2008), possibly due to the largely "symbolic, experiential, and hedonic characteristics" related with sport teams (Tsiotsou, 2012, p. 243).

In order to fill the need for a sport team-specific personality measurement, Tsiotsou (2012) used a sample of Greek sports fans to develop the sport team personality scale (SPORTEAPE) consisting of five personality dimensions: competitiveness, prestige, morality, authenticity, and credibility. The purpose of the current study was to evaluate the SPORTEAPE scale in the United States on a sample of National Lacrosse League fans using a confirmatory factor analysis. A five-factor scale showed acceptable fit in this sample, though the model suffered from a lack of discriminant validity. Potential modifications to the scale including a four-factor scale and word revisions are discussed.

Voluntary wheel running upregulates MRP-2 expression and decreases cardiac doxorubicin accumulation

Presenter(s): Bashore, Alex

Faculty Sponsor(s): Hayward, Reid

Undergraduate Presentation

12:00 - 02:00 in the Afternoon - Room: Mt. Evans & Pikes Peak

Doxorubicin (DOX) is a common antineoplastic agent used to treat cancer patients. The primary side effect of DOX treatment is a dose-dependent cardiotoxicity, which has previously been shown to be reduced with exercise preconditioning in animal models. Multidrug resistant protein-2 (MRP-2) is known to extrude intracellular DOX and its expression may factor into the degree of cardiac DOX accumulation, thereby contributing to the protective effects of exercise. The purpose of this study was to examine exercise differences in cardiac MRP-2 expression and DOX accumulation. Female Sprague-Dawley rats were randomly selected to receive a 15 mg DOX/kg body weight (i.p.) or an equivalent dose of saline at 20 weeks of age. They were either subjected to voluntary wheel running or remained sedentary for 10-weeks. Animals were sacrificed 24 hours following injection and hearts were excised, flushed of blood, and left ventricles (LV) were isolated. High performance liquid chromatography was utilized to quantify DOX and Western blotting to quantify MRP-2 expression. DOX accumulation was lowest in wheel running animals (1056±189 ng DOX/g LV) and was significantly increased ($p<0.05$) in the sedentary group (1285±151 ng DOX/g LV). A significant upregulation ($p<0.05$) of MRP-2 expression was seen with voluntary wheel running when compared to sedentary animals. These data suggest that MRP-2 expression may play a role in decreased DOX accumulation with exercise.

Poster Presentations – Biology Session

Biological Sciences

“Analysis of transgenic reporters for expression of the dpp gene in the Drosophila testis”

Presenter(s): Roberts, Nicole

Faculty Sponsor(s): Leatherman, Judith

Undergraduate Presentation

03:00 - 04:30 in the Afternoon - Room: Mt. Evans

The self-renewal of adult stem cells is regulated by the specific location where these cells reside in the body, called the “niche”. The niche cells provide signals to the stem cells to regulate their behavior. The experimental model that we use is *Drosophila*. The *Drosophila* testis niche has three cell types including hub cells, germ line stem cells (GSCs), and cyst stem cells (CySCs). The hub cells and CySCs secrete BMP ligands, which communicate to the GSCs to self-renew. It is unclear whether BMP expression in the CySC population is redundant with that in the hub, or whether it is uniquely required for GSC self-renewal. In this project, we sought to identify reporter constructs that can be used to easily report on BMP ligand expression in CySCs. There are two BMP ligands required in the *Drosophila* testis, *dpp* and *gbb*. While *gbb* is expressed in both hub and CySCs, for *dpp* it is unknown whether expression is restricted to the hub, or is also found in CySCs. We tested a series of available transgenic reporter constructs that have an upstream regulatory element of the *dpp* gene driving expression of the reporter gene *Gal4*. We crossed each *dpp Gal4* line with UAS GFP females. The *Gal4* protein in the progeny theoretically would bind to UAS which would cause GFP to be expressed. To view the expression pattern, testes were immunostained and the results were examined by confocal microscopy. We tested 4 different lines and out of those, line 1 and 3 showed slight GFP localization in the hub. We did not find any lines with CySC expression, suggesting that the *dpp* regulatory elements tested do not drive expression of *dpp* in CySCs.

Determining the impact of relatedness and age on mate choice in the marine copepod Tigriopus californicus

Presenter(s): Kelly, Michael; Wenger, Ellie

Faculty Sponsor(s): Fisher, Ginger

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans

Marine copepods are a keystone species that reside in tide pool ecosystems. As primary consumers, they feed on phytoplankton and make up the base of many food webs. Copepods are resistant to changes in temperature, salinity, and external chemicals; therefore they are often used in sensitivity studies, yet little is known about their overall behavior. Copepod morphology changes dramatically from the nauplii stage to the copepodite, or adult stage. Adult males will grasp a female during one of the copepodite stages, and wait for her to undergo her final molt, when he will then mate with her. Research has shown that a male will prefer to mate with a non-sibling, and also that a male will prefer an older female who is closer to her final molt, presumably to reduce time until reproduction. The purpose of this study was to determine if male mate choice was more heavily dependent on avoiding inbreeding depression, and therefore preferring non-siblings, or if the age of the female was a more critical factor. Mated pairs of copepods were chosen from a stock and raised in separate boxes until they produced offspring. The young copepods were then raised with their siblings until they reached the copepodite stage. At this point, sibling groups are in their final larval stages and will soon be old enough for mate choice experiments. For these experiments, males will first be given the choice of sibling or non-sibling females to validate their preference for non-siblings. Then males will be given a choice of older and younger females, to validate their preference for older females. Finally, males will be given a choice between an older sibling, and a younger non-sibling in order to assess which is more important for males; age or relatedness.

Development of a Parkinson's Disease Mouse Model Using the Potent Neurotoxin MPTP

Presenter(s): Hartman, Brittany

Faculty Sponsor(s): Thomas, Mark

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans

In this study, we are developing a mouse model of Parkinson's disease, examining the effects of the toxin 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) on dopaminergic cell death in the mouse midbrain. MPTP is a drug that closely models the effects of Parkinson's disease on an individual, and its role in oxidative stress and contribution to inflammation is central to dopaminergic cell death, the primary causative feature of Parkinson's disease. We will determine the density of dopaminergic cells in the midbrain of control mice, to establish a baseline for comparison with MPTP-treated mice. We expect that treatment with MPTP will result in substantial loss of dopaminergic neurons. We intend to use this model to study treatments that may prevent dopamine cell death in relation to Parkinson's disease.

Immunocytochemical methods will be used to identify dopaminergic midbrain neurons, using the enzyme, tyrosine hydroxylase (TH) as a marker. Sections of mouse midbrain will be prepared from fixed and frozen brains (C57 Bl/6 mice of both sexes from

our UNC colony). Sections will be incubated overnight in primary TH-antibody (1:1000 dilution), and then incubated for one hour in fluorescence-conjugated secondary antibody. The sections will then be imaged with a confocal microscope, and cell counts determined using ImageJ software. Future studies will focus on the role of antioxidants and anti-inflammatory drugs in preventing dopaminergic cell death to hopefully improve Parkinson's disease progression and prognosis.

Does territory preference in Canyon Wrens depend on crevice density?

Presenter(s): Lashaway, Daynia

Faculty Sponsor(s): Benedict, Lauryn

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans

An understanding of territory choice in Canyon Wrens (*Catherpes mexicanus*) can be used to ensure that appropriate types and amounts of habitat are being preserved and can serve as a basis when considering how to preserve habitat for birds with similar preferences. I tested whether canyon wrens prefer cliff habitats with more or fewer rock crevices. My hypothesis is that Canyon Wrens (*Catherpes mexicanus*) will choose territories with more crevices because there will be a greater food supply contained within the higher crevice density territories. To test this hypothesis I measured crevice density at 22 locations where Canyon Wrens had established territories and 22 randomly selected sites. Data were collected blind from 44 photographs that were taken from 50 meters away at 300 DPI resolution. The images were pasted into Microsoft Powerpoint and covered with a transparent grid that was 48 x 48 squares and viewed at 290%. At all intersecting points of the grid I looked to see if suitable Canyon Wren habitat existed and if there was a crevice present. Preliminary results from 21 photographs (10 from territories and 11 from similar random sites) suggest that there is no difference in crevice density in areas where Canyon Wrens live and areas where they do not. This suggests that other factors drive the selection of specific territories, and that there is available habitat with appropriate crevice density not being used. The knowledge gained from understanding territory preference may provide directions for future research on Canyon Wrens.

Effects of fish oil treatment on prostaglandin F2 α -induced mitogen activated protein (MAP)-kinase cell signaling pathway in bovine luteal cells

Presenter(s): Gilbert, Zachery

Faculty Sponsor(s): Burns, Patrick

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans

The corpus luteum (CL) is a short-lived, yet important endocrine gland that forms from follicular cells of the ovary following ovulation. The primary hormone released by the CL is progesterone, which is a critical hormone that prepares the uterus for pregnancy. Luteolysis occurs during the luteal phase of the ovarian cycle in the non-pregnant female, and experimental evidence suggests that this event is controlled by a number of factors, among which is the prostaglandin (PG) PGF₂ α . Inadequate control of PGF₂ α synthesis can lead to premature CL regression leading to loss of pregnancy. PGF₂ α operates through a membrane-bound 7-helix receptor that interacts with lipid microdomains within the plasma membrane to increase downstream signaling. Omega-3 fatty acids are thought to disrupt lipid microdomains, thus rendering such signaling platforms incapable of interacting with intracellular protein hardware. This experiment was aimed at determining the effects of omega-3 fatty acids on the PG signaling pathway in bovine luteal cells. Primary mixed luteal cell cultures were prepared using harvested bovine CL (n = 3), and further partitioned into either control cells or cells loaded with omega-3 fatty acids from fish oil (FO). Two activators of the MAP-kinase signaling pathway, PGF₂ α and phorbol ester (PdBu) were examined at 0 and 15 min post-treatment. Cells were lysed and prepared for Western blotting, which was used to measure the amount of phosphorylated (activated) p38 MAP kinase. Fish oil treatment had no effect on PdBu-induced phosphorylation of p38 terminal MAP-kinase, whereas PGF₂ α -induced phosphorylation was decreased when compared to controls (P = 0.15). It appears that FO treatment effectively disrupts lipid microdomains in the plasma membrane and prevents PGF₂ α activation of intracellular signaling hardware that leads to activation of p38 MAP-kinase.

Effect of omega-3 fatty acids on lateral mobility of the prostaglandin (FP) receptor in bovine luteal cells.

Presenter(s): Balderston, Stephanie

Faculty Sponsor(s): Burns, Patrick

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans

Within the lipid bilayer of cells there are unique regions high in cholesterol and sphingolipids called lipid microdomains or rafts, which are important for signal transduction. Receptors are generally associated with the bulk lipid of the membrane in the unbound state. Following binding with the hormone, receptor moves into the lipid microdomain where it can interact with multiple downstream signaling molecules. In a recent study in our laboratory the incorporation of fish oils, rich in omega-3 fatty acids, into bovine luteal cells showed disruption of the lipid microdomain in a dose response manner. The objective of this study is to determine if fish oils also affect FP receptor mobility using fluorescence recovery after photobleaching (FRAP). Ovaries were obtained from a local slaughterhouse and the corpora lutea was dissected and cut into 1 mm³ fragments and digested with collagenase. Mixed luteal cells were cultured in T-75 cm² culture flasks using Ham's F-12 culture medium supplemented with 5%

fetal calf serum, insulin (5 ug/ml), transferrin (5 ug/ml), selenium (5 ng/ml), 100 U/ml penicillin, 0.1 mg/ml streptomycin, and 0.25 mg/ml amphotericin B (pH 7.34) for 48 hours in an atmosphere of 95% air, 5% CO₂ at 37°C. Cells were then incubated on 35mm microscopy dishes in medium with or without 0.03% fish oil for 48-72 hours. FP receptors were labeled with 1.5 ug rabbit anti-mouse antibody and cultured overnight. Cells were visualized using goat anti-rabbit F(ab')₂ antibody conjugated to Alexa 488 at 1:300. Cells were imaged with a Zeiss confocal microscope followed by bleaching of a selected area. Using easyFRAP software to analyze relative intensity, results showed limited recovery of the FP receptor after bleaching in either treatment. In conclusion the FP receptor appears to be fixed and not mobile with or without fish oil treatment.

An Examination of the Cytotoxic Effects of Snake Venom on Human Colon Cancer Cells

Presenter(s): Maxey, Elizabeth

Faculty Sponsor(s): Mackessy, Stephen

Research Excellence Award Finalist

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans

Snake venom is a complex mixture of enzymes, proteins and other substances with toxic/lethal properties which immobilize and aid in digestion of prey. Venom's biological effects are caused primarily by many proteins found in the venom. Some of these proteins may provide novel leads for drug discovery, with applications to many human diseases. Cancers are characterized by uncontrolled growth and metastatic spread of abnormal cells that commonly results in death; colorectal cancer is the fourth most commonly diagnosed and second most lethal cancer in the United States (2011). Treatment options for colon cancer are limited, depending on the stage of the cancer at diagnosis, illustrating the need for new therapeutics. In this study, the cytotoxicity of Pseudechis porphyriacus venom and purified proteins toward Colo205 cancer cells was explored. Previous work showed that the venom contains metalloproteinases (SVMPs), phospholipases A₂ (PLA₂), three-fingered toxins (3FTxs) and cysteine-rich secretory proteins (CRISPs); in spite of these components, the venom is only moderately toxic (LD₅₀ ~2.5 mg/kg). Crude Pseudechis venom showed potent, dose-dependent toxicity toward Colo205 cells. Fractionation of crude venom via cation-exchange FPLC resulted in 13 prominent peaks, primarily 6 and 14 kDa proteins; peaks 1, 11, 12, 13 were cytotoxic. Purification of the cytotoxic proteins was performed via reverse-phase HPLC. The purified proteins ranged from having no cytotoxic effect to moderate/potent cytotoxic effect on Colo205 cells. Mass spectrometry was used to aid in identification of each purified protein. The need to develop alternative treatments for colorectal cancer is essential, as current options are limited and often have severe side effects, due in part to the sensitivity of the colorectal area to traditional cancer therapies. If apparent anti-cancer effects observed with this venom and its purified proteins are specific, these results may produce leads for novel drug therapies to treat colorectal cancer.

Identification of Dopamine Receptors on a Class of Mouse Prefrontal Cortical Neurons

Presenter(s): Johnson, Vanessa

Faculty Sponsor(s): Thomas, Mark

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans & Pikes Peak

Working memory (WM) is a form of memory used to hold specific information in mind for the performance of a task. The prefrontal cortex (PFC) is the area of the brain involved in WM. Normal WM requires appropriate levels of the brain transmitter, dopamine. In humans and animals, EEG recordings during WM tasks reveal cohesive electrical rhythmic activity in the PFC. Our research is aimed at understanding the cellular properties of mouse neurons that generate rhythmic activity in PFC neurons that contribute to WM processes, and how they are modulated by dopamine.

The principal output neurons of the PFC are located in the deep layers (Layer 5). Recent studies have identified at least two types of Layer 5 cells, which differ in shape, regions of projection, and electrical properties. The class of L5 neurons projecting to the brainstem (where they may regulate motor aspects of WM tasks) can be visually identified with markers for the transcription factor Otx-1. Dopamine mediates its effects through two types of receptors, D1 and D2. It has been proposed by others that brainstem-projecting L5 pyramidal cells are the only L5 cells that express D2-type dopamine receptors. We will test this hypothesis by identifying neurons that express both Otx-1 and D2-type receptors (D2R).

Immunocytochemical methods will be used to identify Otx-1 and D2 receptors. 40 micron slices from the PFC will be made from fixed and frozen C57-BL/6 mouse brains. The slices will be incubated overnight in mouse anti-Otx-1 antibodies and rabbit anti-D2R antibodies. The slices will then be incubated in anti-mouse Alexa 488-conjugated antibodies and secondary anti-rabbit Alexa 568-conjugated antibodies, for one hour. Fluorescence will be viewed with a confocal microscope, with green fluorescence identifying Otx-1 positive cells, and orange fluorescence identifying D2R-positive cells. We predict that only Otx-1-expressing cells will stain for D2R's.

Isolation of lipid microdomains from bovine luteal cells using a sodium carbonate buffer and ultracentrifugation through sucrose gradients

Presenter(s): Yu, Yi

Faculty Sponsor(s): Burns, Patrick

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans

Lipid microdomains are regions of the plasma membrane enriched with cholesterol and sphingolipids. These domains regulate endocytosis, cellular trafficking, and cell signaling. Lipid microdomains can be isolated based on density from bulk membrane lipid using ultracentrifugation through sucrose gradients due to its high ratio of lipid to protein. The objective of this study was to develop an effective sodium carbonate protocol for isolating lipid microdomains from bovine luteal cells. Mixed bovine luteal cells were prepared from corpora lutea obtained from a local slaughterhouse. Cells were washed 2x in phosphate buffered saline and pellets were resuspended in 500 mM sodium carbonate (pH = 11) and incubated on ice for 30 min. Cell suspensions were then homogenized in a glass hand-held homogenizer (10 strokes) followed by either no further homogenization or ultrasonic homogenization (three 20 sec bursts) on ice at 10, 20, 50 or 70% power output. An equal volume of 90% sucrose in 1xMES buffer (20% glycerol, 150 mM NaCl, 2 mM EDTA, 25 mM MES; pH 6.5) was then added to samples resulting in a final concentration of 45% sucrose and 0.5xMES buffer. Samples were carefully layered with a discontinuous sucrose gradient of 35 and 5% sucrose in 0.5xMES buffer containing 250 mM sodium carbonate. Samples were centrifuged at 250,000 x g for 24 h at 4°C. Ten equal fractions were collected and an aliquot of each fraction was subjected to SDS-PAGE and western blotting. Membranes were probed for flotillin and caveolin, marker proteins for lipid microdomains. Ultrasonic homogenization at all power settings failed to adequately partition flotillin and caveolin into lipid microdomains (fractions 1-5). Samples receiving only hand-held homogenization had clear separation of marker proteins into lipid microdomains from bulk lipid (fractions 7-10). In conclusion, only hand-held homogenization should be used when preparing lipid microdomains from bovine luteal cells.

Joint action approach to studying pesticide effects on the marine copepod Tigriopus californicus.

Presenter(s): Cameron, Lindsay

Faculty Sponsor(s): Fisher, Ginger

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans

This project examines toxicity effects of pesticide combinations on the planktonic marine copepod *Tigriopus californicus*. The pesticides tested were cypermethrin and emamectin benzoate, two common chemicals used in commercial salmon farming. Cypermethrin is a neurostimulant that causes prolonged contraction of muscles and interrupts normal mobility, whereas emamectin benzoate disrupts neurotransmitters causing irreversible paralysis. With the increase of salmon farming in the United States concern has been raised that the pesticides will begin to impact the endemic species of copepods found. We first determine the LC50 values of each chemical on *Tigriopus californicus*. To do this a 48- hour toxicity study was conducted. Oviparous females were isolated from a stock population and placed into 24- well plates containing 2mL of the chemical solution at concentrations of 0.25, 0.5, 2.5, and 5µg/L. Three trials were conducted and compared to controls. Probit analysis was used and the LC50 value of cypermethrin was 2.6µ/L and for emamectin benzoate the LC50 was 2.56µg/L. Presently we are attempting to determine the additive effects of both of these chemicals. It is critical to determine if these pesticides have additive, agonistic, or synergistic effects on the copepods to more accurately determine the effects that mixtures of these chemicals will have in the natural environment. Binary toxicity tests will be performed to determine if there is a similar joint action or independent joint action of these pesticides. Once the overall mortality patterns have been determined, lower levels of mixtures will be used to determine sublethal effects such as egg production, swimming speed, developmental time, and mating behavior.

Owens Valley hybrid zone: providing new insight into song diversity in sage sparrows

Presenter(s): King, Carissa

Faculty Sponsor(s): Benedict, Lauryn

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans

In Owens Valley, CA a hybrid zone exists between two different subspecies of sage sparrow: *Amphispiza belli canescens* and *Amphispiza belli nevadensis*. Multiple genetic studies have been performed on the birds living in the hybrid zone, but their songs have never been analyzed. Analysis of the songs will provide insight into the patterns of song diversity by showing us if a hybrid song exists. If a hybrid song exists then a bird may learn its song from both parent populations showing a mix of cultural learning. Conversely, if no hybrid song exists then hybrid birds learn their songs from one parent population or another. The goal of this study was to analyze, compare, and contrast the songs from birds located at the northern end (pure *A.b. nevadensis*), southern end (pure *A.b. canescens*), and the middle of the contact zone (hybrids). We hypothesized that the songs from the middle of the hybrid zone would show a mixture of both northern and southern song characteristics. RAVEN was used to visualize and analyze the songs based on 7 different variables describing song timing and audio frequency. We found significant differences in all variables except one between the northern end and the southern end of Owens Valley. The songs sung in the hybrid zone supported our hypothesis because they were similar to the northern end for some variables and to the southern end for others. We concluded that song in sage sparrows is learned from both parent populations leading to the creation of a hybrid song. Future plans for this project include expanding our sample size and testing additional song features.

Pvr is a receptor tyrosine kinase (RTK) that functions in Drosophila testis cyst stem cells

Presenter(s): Johnson, Kelli

Faculty Sponsor(s): Leatherman, Judith

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans

The *Drosophila* testis niche is an excellent model for studying adult stem cells. This niche is composed of a group of somatic cells called the hub, surrounded by two stem cell populations, germline stem cells (GSCs) and cyst stem cells (CySCs). Extracellular signal-regulated kinase (ERK) signaling activated by epidermal growth factor receptor (EGFR) promotes differentiation in cyst cells, leading to differentiation of neighboring germ cells. However, dpERK accumulates in both CySCs and cyst cells, and it is not understood how differentiation is prevented in CySCs with ERK signaling. CySCs still accumulate dpERK upon EGFR ligand inhibition, suggesting another RTK may be functional. We show that Pvr (PDGF-VEGF receptor) is an RTK expressed in the testis, and its ligand Pvf1 is restricted to the hub, suggesting Pvr is active in CySCs. Dominant negative cyst lineage Pvr showed modest CySC loss, while constitutive Pvr promoted proliferation of cyst lineage cells away from the hub. Interestingly, constitutive Pvr did not promote differentiation of normal GSCs, while constitutive Ras alone did promote rapid GSC differentiation. Thus, active Pvr promotes some stem-like characteristics, suggesting that Pvr signaling is distinct from ERK signaling alone. This distinction may explain why CySCs with dpERK accumulation do not differentiate. We are also investigating if CySC-restricted Zfh-1 may influence RTK signaling. Zfh-1 is a member of the ZEB family, which promote epithelial to mesenchymal transition. ZEB factors impart resistance to EGFR-induced senescence, confer resistance to EGFR inhibitors, and Zfh-1 was identified in an RNAi screen as a modifier of RTK signaling. In a preliminary approach, we are characterizing Zfh-1's effect on ERK signaling in cultured cells. We found that stimulated S2 cells accumulated high levels of dpERK, and Zfh-1 knockdown slightly inhibited dpERK accumulation. Future work will clarify whether Zfh-1 differentially regulates EGFR versus Pvr pathway activation.

Quantification of Metals in Snake Venoms Using X-Ray Fluorometry

Presenter(s): Maxey, Elizabeth

Faculty Sponsor(s): Mackessy, Stephen

Undergraduate Presentation

03:00 - 04:30 in the Afternoon - Room: Mt. Evans

The presence of low-molecular weight components, such as metals, in snake venom is a neglected area of research in this field. The role of metals in snake venoms varies and is not completely understood, though certain metals appear to have roles in the hemorrhagic and proteolytic activity of venoms. A previous study, performed several decades ago, focused on quantifying the metal content of 17 different species of snake venom using atomic absorption (AA) and the effect of removing the metals on venom activity. In this study, the metal content of venoms from members of the Viperidae, Colubridae and Elapidae families of snakes were quantified using x-ray fluorimetry (XRF). X-ray fluorimetry is a more sensitive method of analyzing samples for the presence of metal ions and also allows a much smaller sample size to be analyzed than other analytical methods. One L of a Gallium internal standard was mixed with 25 L of crude snake venom; 10 L of this mixture was pipetted onto acrylic discs and placed in the oven to dry. After the sample runs in the x-ray fluorimeter were finished, the data was analyzed for the presence of metals; common metals found to be in venoms were K, Cl, Ca, Mg and Zn. Data was then compared to the previous data from Friederich and Tu. Further studies on the specific roles of different metal ions in various snake venoms is necessary to understand the functionality of the venom and specific enzymes and proteins found within the venom.

SUR-1 protein expression levels in an MPTP mouse model of Parkinson's disease

Presenter(s): Blazosky, Elyse

Faculty Sponsor(s): Thomas, Mark

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans

The primary pathological feature of Parkinson's Disease is the progressive degeneration of dopaminergic (DA) neurons in the substantia nigra pars compacta (SNpc) of the midbrain. Dopamine is a neurotransmitter found in the brain that plays an important role in voluntary movement, cognition and behavior. The loss of dopamine can cause tremors, rigidity and cognitive impairment. An effective model for mimicking the gradual loss of DA neurons found in Parkinson's disease is the MPTP mouse. 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine causes a gradual buildup of free radical oxides in DA neurons that damages and eventually kills the cell like in Parkinson's disease. DA neurons are physiologically very active and generate a high amount of free oxide radicals as a byproduct of ATP production. They can reduce the demand for ATP by producing K-ATP channels which play a role in down regulating activity of the DA neuron. K-ATP channels contain a sulfonylurea receptor (SUR) which renders the channel sensitive to the neuron's redox potential. The purpose of this experiment is to investigate the levels of SUR-1 protein in MPTP treated mice versus untreated controls. Our hypothesis is that the administration of MPTP will lead to the production of more protective K-ATP channels than in control mice.

Two experimental groups will be used: a control group (n=6) and an MPTP treated group (n=6). Mice will be sacrificed, the brains removed and mid-brains dissected. Proteins from brain tissue homogenates will be separated using SDS-polyacrylamide gel electrophoresis and transferred to a nitrocellulose membrane. SUR-1 antibody will be used to quantify K-ATP SUR-1 channel subunits, detected using HRP-conjugated secondary antibodies and chemiluminescence. Relative amounts of SUR-1 potassium

channel subunit protein between groups will be measured using densitometric analysis with ImageJ analyzing software. Our data may lead to a better understanding of how dopaminergic neurons respond to oxidative stress.

Tzabcanin, a novel snake venom disintegrin, inhibits metastasis in melanoma (skin cancer) by binding to the integrin $\alpha v \beta 3$

Presenter(s): Wanner, Megan

Faculty Sponsor(s): Mackessy, Stephen

Undergraduate Presentation

03:30 - 04:30 in the Afternoon - Room: Mt. Evans

Cancers, which resulted in nearly 600,000 death in 2012 in the United States alone, are caused by the uncontrolled growth of cells that can metastasize throughout the body. Cancerous cells rely on a class of cell membrane proteins, integrins, which play a critical role in cell survival, proliferation and invasion. Integrins recognize and bind to several extracellular matrix (ECM) proteins such as fibronectin and vitronectin, and this integrin-ECM interaction is critical for metastasis to occur. Cancer cell binding (via integrins) to the blood glycoprotein fibrinogen has also been shown to increase cancer cell survival significantly. Interestingly, some integrins, such as $\alpha v \beta 3$, $\alpha v \beta 6$ and $\alpha 5 \beta 1$, are nearly undetectable in normal tissue yet are over-expressed 100-fold in some tumors. Using a multistep high performance liquid chromatography method, we isolated a novel 7.1 kDa disintegrin protein (tzabcanin) from the venom of the Yucatán Rattlesnake (*Crotalus simus tzabcan*). Cell proliferation (MTT) assays indicated that tzabcanin is not toxic to cells; however, tzabcanin produced a dose-dependent decrease of human melanoma (A-375) cell binding to the ECM protein vitronectin, with 93% inhibition of cell binding at 10 $\mu\text{g}/50,000$ cells. Tzabcanin was also a potent inhibitor of A-375 binding to fibrinogen, with 100% binding inhibition at 600 ng. Further, tzabcanin inhibited migration of A-375 cells by approximately 58% and 50% over 36 and 48 hour time frames, respectively. Flow cytometry results identified that tzabcanin specifically binds to the integrin $\alpha v \beta 3$ in A-375 cells, producing these anti-cancer effects. Our results clearly show that tzabcanin interferes with melanoma $\alpha v \beta 3$ binding to ECM proteins and fibrinogen, an interaction which these skin cancer cells utilize during metastasis. Because $\alpha v \beta 3$ is highly over-expressed in cancerous cells, tzabcanin may be useful as a potential therapeutic for inhibiting cancer progression, without targeting other integrins expressed in normal, healthy tissue.

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