

A photograph of a person's lower leg and foot. The person is wearing blue denim jeans and a red shoe. They are stepping on a white crosswalk line on a dark asphalt surface. The background shows more of the asphalt and a manhole cover.

**3RD ANNUAL
3 UNDERGRADUATE
RESEARCH AND
SCHOLARSHIP
CONFERENCE**



Boise State University
THIRD ANNUAL
UNDERGRADUATE RESEARCH AND
SCHOLARSHIP CONFERENCE

Student Union Building
April 17, 2006
1:00 – 4:00pm

Schedule of Events

Poster Session	1:00 – 4:00 pm	Jordan Ballroom
Art Display	1:00 – 4:00 pm	SUB Gallery, 2nd Floor
Podium Presentations	1:30– 3:00 pm	Barnwell & Farnsworth
Performing Arts Session	1:30 – 3:00 pm	Jordan Ballroom
Media in Action	2:00 – 3:00 pm	Lookout
Speakers & Awards	3:30 pm	Jordan Ballroom
Bob Kustra, President		
Sona K. Andrews, Provost		
Wyatt Parke, ASBSU President		
Jack Pelton, Interim Vice President for Research		



Welcome to the Boise State University Undergraduate Research and Scholarship Conference. This conference provides undergraduate students at Boise State an opportunity to display their research projects and be recognized for their exceptional work.

Allow me to be the first to congratulate those students who have been selected as a part of this important event. The faculty sponsors who assist and support these students with their research have good reason to feel proud. These faculty members should also be commended for their commitment to learning and their dedication to the personal success of Boise State students. The projects on display span an extensive range of subjects. No two are alike; each project reflects the effort of our students and faculty toward the betterment of our university, community, and state through academic research and exploration.

The previous two years of this conference have left an impressionable legacy at Boise State. We look forward to this program expanding in future years. As President, I am committed to supporting the process of discovery and research at all levels of the University, and I will continue to encourage growth in research opportunities and activities as part of the undergraduate educational experience at Boise State.

I hope you enjoy the conference and thank you for your support of this annual event.

Warm regards,

A handwritten signature in cursive script that reads "Bob Kustra".

Bob Kustra



Welcome to the Third Annual Boise State University Undergraduate Research and Scholarship Conference. It is through this event, among many others, that Boise State University is advancing as a Metropolitan Research University of Distinction.

The students participating in today's conference represent the diverse range of academic disciplines that Boise State University has to offer. They have each demonstrated a drive and determination that exceeds that of the average student. Through their hard work, they have gained research and presentation skills that will prepare them for the world beyond academia. It is with great pride and enthusiasm that I congratulate these exceptional students and honor them for their outstanding work.

I would also like to extend my appreciation to our faculty sponsors. Their dedication to enriching the learning environment at Boise State University is another testament to our vibrancy and growth. We thank them for their commitment to our students and for creating opportunities for scholarly achievement.

For those of you joining us today, I hope that you take time to meet with our students and learn about the research they have conducted. You will not be disappointed. On behalf of Boise State University, I thank you for your support and hope that you enjoy this year's conference.

Sona K. Andrews

– Podium Presentations –

COLLEGE OF ARTS AND SCIENCES
1:30-3:00PM, BISHOP BARNWELL ROOM

Dr. Helen Lojek, Department of English, Discussant

EPISTEMIC DILEMMAS OF RAPHAEL'S SCHOOL OF ATHENS

Shane Girard (Department of Art) Lee Ann Turner

Raphael's fresco in the Stanza della Segnatura has continued to be subject to a multitude of discursive debates among art historians to this day. The enigmatic nature of this painting provides exemplary insight of the idealistic paradigm of which art historians scrupulously endeavor to assess when analyzing works that succumb to uncertainty. Such quandaries are disclosed in my paper on the essentiality of epistemic problems which are presented to art historians. My paper evaluates historical and contemporary accounts of explanations regarding specific aspects of Raphael's School of Athens. Such explanations provide examples of epistemic perplexities that exist in accounting for works of art with a dearth of textual evidence as is the case with the School of Athens. My argument is whether such analyses are formed from justified true belief or absolute knowledge. I conducted my research for an art history class on methods and theory in art history.

STILL LIFE: OBJECT AND THEME IN 17TH CENTURY FRANCE

Jenaleigh Kiebert (Department of Art) Janice Neri

While the genre of still life paintings is often admired for proximity to reality, attention to detail, and demonstration of artistic skill, further examination reveals that there is much to be learned from these paintings as they often reflect themes and values of the culture from which they come. This body of research examines still life paintings from 17th century France, with emphasis on the objects represented in the works. The value of these objects, such as goblets, globes, books, hunting implements, etc. in French society of this era will be discussed as a means of interpreting the importance of their depiction in works of art. Lastly, it will determine whether a particularly French style of still life exists for this era or whether the works from France are simply following the themes and style of their predecessors from other regions.

19TH CENTURY CLASS IDENTITY DEMONSTRATED IN THE WORKS OF BAUDELAIRE AND MANET

Jenaleigh Kiebert (Department of Art) Janice Neri

This research compares the works of writer Charles Baudelaire and Edouard Manet and examines similar themes represented in their works. These themes relate to events and culture of France in the mid to late 19th century such as class division, changes in the economy, and the reconstruction of Paris. Changes such as this greatly affected the way people were to interact with one another and how public spaces would come to be viewed. Conflicting treatments of modernity and representations of modern life in the works of Manet and Baudelaire reflect the anxiety of personal identity and class definition experienced by many 19th century Parisians as well as the artists' own struggles with modern issues and investigating their own identities in a modern society.

JAMES CASTLE: TOTEM

Mardie Stone (Department of Art) Janice Neri

James Castle (1899-1977), a deaf, mute, self-taught artist quietly working in isolation mastered the art of perspective without the benefit of an education or artistic training. The majority of his subject matter is straightforward, but some of his drawings have an unusual aspect to them which numerous curators and other professionals have labeled "totems." Scholars have not been able to explain why Castle placed these seemingly disassociated objects in his landscape, interior architectural and architectural drawings. By using a theoretical approach of semiotics, I have presented the argument that James Castle used the totems as a measuring device towards the development of perspective. Upon the mastery of perspective the totems, no longer useful, disappear from his drawings.

– Podium Presentations –

College of Social Sciences and Public Affairs/College of Education
1:30-3:00pm, Farnsworth Room

Dr. Leslie Martin, Department of Sociology, Discussant

LETTING GO OF THE HARNESS FOR THE LAST TIME: A DESCRIPTIVE REALISM APPROACH TO EXPLORING THE ENDING OF WORKING RELATIONSHIPS WITH GUIDE DOGS

Deborah Allen (McNair Scholar) (Department of Sociology) Virginia Husting and Robin Allen

In this research, I use a combination of feminist methodology and descriptive realism to explore my experiences and the experiences of other totally blind individuals who have ended working relationships with guide dogs. Little research has been done on the approximately eight thousand blind people who are partnered with guide dogs in the United States. A primary goal of this qualitative study is to give voice to the unique narratives of people whose experiences are rarely explored in academic literature. I blend information I gathered during interviews with five guide dog instructors, five blind authors, and ten blind participants with my autoethnography to illustrate how concepts can be applied to broader social issues, such as policies at agencies that provide guide dogs to blind individuals.

EXPEDITIONARY LEARNING: A QUALITATIVE STUDY

Brandi Bailey (McNair Scholar) (Department of Education & Social Science) Leslie Martin

Expeditionary Learning Outward Bound (ELOB) is a model of learning that encourages students to be active participants in their quest for knowledge. Many charter schools have adopted ELOB as the model through which students learn content. The existing literature demonstrates that more research is needed to conclude if this model is helping previous struggling learners succeed. The intent of this research is to study specifically if the ELOB model is changing students' attitudes towards learning. For this qualitative study, two students new to an ELOB environment, their parents and teachers were interviewed. Students were also observed in their classroom three times. The conclusions from this research demonstrate how ELOB can be an effective model for previously unsuccessful learners and what within the model can still be improved.

FINDING FEEDOM: A DISCOURSE ANALYSIS OF BUSH'S WEEKLY ADDRESSES

Macy Boggs (Department of Sociology) Michael Blain

This paper employs Mann's (2003) perspective on social power to examine the use of Bush Administrations' ideological discourse of freedom and democracy to justify its imperial policies. While ordinary Americans prefer not to think of themselves or their nation as imperialist, many social scientists believe that the US is an imperial nation. President Bush's weekly radio speeches are examples of strategic discourse in which actors are subjectified through their relationship to freedom in a victimage and democracy promotion rhetoric. Using Blain's (1994) politics of victimage ritual perspective, heroes, villains, and victims are identified. These actors' identities, motives and actions in democracy promotion are described. Mann's four forms of social power – political, economic, ideological and military, are associated with victimage and democracy rhetoric.

– Podium Presentations –

ZERO TOLERANCE POLICING IN A RURAL SETTING

Jon Cooper (Department of Criminal Justice Administration) Andrew Giacomazzi

While most studies of zero tolerance policing take place in large urban areas, the setting for the current study is rural, adding to an emerging body of literature detailing interaction between rural officers and citizens. It is hypothesized that because greater informal social control tends to exist in rural areas as compared to urban areas, rural zero tolerance policing will not result in decreases in serious crime. Further, it is hypothesized that with the implementation of zero tolerance policing, a rural agency will experience an increase in complaints against the department. To explore both hypotheses, a before-and-after design was employed using agency data. City council minutes and letters-to-the-editor were used in a content analysis to further explore the second hypothesis. Results from this study show support for the first hypothesis. The second hypothesis does not appear to be supported by the quantitative data. Discussion of this phenomenon is presented.

STUDENT DEVELOPMENT THEORY AND LISTENING THEORY: CONNECTIONS, IMPLICATIONS AND PRACTICE

Clay Cox (Department of Communication) Laurel Traynowicz

General listening theories and established student development theory both place the responsibility for creating meaning upon the listener. This primary role in creating meaning in both frameworks was established first by revealing how listening theory places the responsibility for creating meaning upon the listener. The same responsibility exists in student development theories; the student is ultimately accountable for her or his own understanding and education. The connections between these two theories have implications for students and their academic advisors. Understanding the primary role of the listener/student could benefit both the student and the advisor. This research connects these two theoretical perspectives and explores the potential benefits of informing both student and advisor of the implications.

KING KONG: MONSTER FOR ALL ERAS

Olivia Umphrey (Department of History) Todd Shallat

With the release of King Kong in December 2005, we were once again transported to the world of Kong, Ann Darrow and Carl Denham. For 70 years, the Kong movies have attracted audiences. As films can be viewed as cultural artifacts, which speak about the eras they were made in and the audience they were made for, one wonders how one story can span across decades. This project seeks to answer what it is about the Kong films that have allowed them to reach such vast audiences and have success over the years.

– Performing Arts –

1:30-3:00pm, Jordan Ballroom

Dawn Craner Department of Communication, Respondent

Marla Hansen, Department of Theatre Arts – Dance Program, Respondent

THE MEATRIX HAS YOU: COMMUNICATION ANALYSIS

Wayne Rysavy (Department of Communication) Dawn Craner

This genre of scholarship involves an examination of the ideas, devices, and themes employed in a specific form of communication artifact, e.g., a speech, a movie, a commercial, or possibly a work of visual art. The artifact is investigated using a theory that enables a clarifying perspective for a focused analysis. In "The Meatrix Has You," a flash clip (presented at www.themeatrix.com) is examined through use of Walter Fisher's Narrative Rationality Theory. As a result, issues and implications of our nation's mass production and consumption of meats and animal products as presented in The Meatrix begin to stand out boldly. Finally, the listening audience must confront their own personal consumption of such products as they face humorous, but serious, accusations from The Meatrix.

MACARONI AND CHEESE

Molly Beardmore (Department of Theatre Arts) Marla Hansen

"There is a vitality, an energetic life force, that is translated through you into action, and because there is only one of you in all of time, this expression is unique. And if you block it, it will never exist through any other medium and be lost."

– Martha Graham

It is only recently that I have truly begun to explore and appreciate my uniqueness. We often forget how wonderful it is to be inimitable in our own right. Every day we are given the opportunity to embody creativity in our lives, but the threatening unknown often hinders our ambitions. I have learned to embrace the chance I have in life to be a masterful artist, one who creates ideas and visions through movement. The piece I am presenting represents a new chapter in my exploration of creativity. It is full of vigor and excitement, a liveliness that only I possess.

RUN FREE

Jennifer Waters (Department of Theatre Arts) Marla Hansen

You don't have to agree with those around you. Express yourself in your own way by following your heart. "Run Free" is a visual expression of feelings through the medium of a human being, dancing freely and showing physical strength as well as emotional. Expression is not easy, especially when others may not agree with what you say. In this piece the words are taken from music and transferred in the mind to become one energy exerted through motion. Dare to be free.

SELLING VOTERS SHORT: A RHETORICAL ANALYSIS OF WAL-MART'S USE OF NAZI IMAGERY TO INFLUENCE CITIZENS

Kristin L. Davidson (Department of Criminal Justice Administration) Dawn Craner

On May 8, 2005, Flagstaff Arizona residents opened up their Arizona Daily Sun newspapers and were exposed to a full-page advertisement sponsored by the Wal-Mart Corporation, opposing Proposition 100, a local zoning ordinance. The advertisement utilized a significant historical image as a marketing tool to convince residents that their rights were being threatened. I posed the research question: With historical images becoming increasingly thrust upon us as tools for advertising, will the lessons learned from the original contextual message of the image be forced to take a back seat to a product or idea presently being marketed? To attempt to answer this question, I first explored the Wal-Mart-sponsored ad against Proposition 100. I then examined Judith Williamson's "Historical Images in Advertising" Theory, and finally, I used Williamsons' theory to analyze the advertisement, focusing on serious implications that can result from this type of mass media communication.

– Performing Arts –

CREATIVITY WITHIN CONFINEMENTS

Katie Ponozzo (Department of Theatre Arts) Marla Hansen

For an up coming dance audition I must perform a two minute solo that shows all the strengths I have as a dancer. I must come up with unique and creative movements that will capture the judges' attentions while at the same time showing my technique and versatility. I found this to be a fairly difficult endeavor. For within the confines of two minutes I must create movements that define me as a dancer, I must show my strength, flexibility, turning ability, range of motion and range of emotion. So it is with this piece that I will be creative within the confinements that I am given.

MY PLACE IN THE UNIVERSE

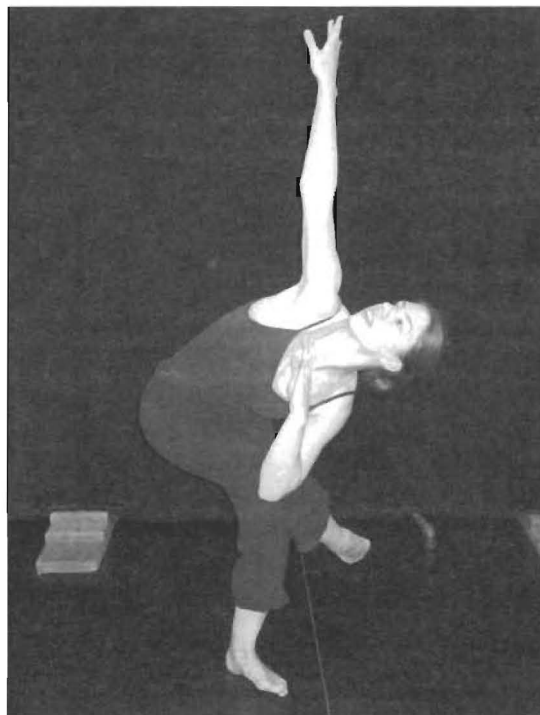
Camille Levi (Department of Communication) Dawn Craner

An oral interpretation program constructed around a central theme, this artistic presentation was designed to share with an audience a variety of poetic texts woven together to speak to the notion of the program title above, "My Place in the Universe." Twisting and turning through variations on that theme, this performance attempts to name such a place by asking a question that lies at the foundation of the human psyche: "Why am I here?" Carefully composed to address such a critical question, this program relies on and artistically displays poetry by Billy Collins, Allison Hawthorne Deming, Rita Dove, & Tim Siebles.

UNIVERSAL INFLUENCE

Hailey Hays, Katie Ponozzo, Amie Wingert, Jennifer Waters, Gonzalo Valdez, Molly Beardmore, Sarah Nielson, Lesley Uehling, and Brittany Gardner (Department of Theatre Arts) Marla Hansen

After studying an array of movement from various technical and global areas, the choreography study Universal Influence, is a melting pot of genres wrapped into one. Mediums that have spurred this piece include influences from cultures such as Chinese, African, Indian, and American, as well as dance genres including modern, jazz, and ballet. The Turkish Belly Dance music is performed by drumming only, and though it is a single instrument, it goes through a variety of rhythm, beats, and movements to bring about a full sound that you can't help but move your body to.



– Art Gallery –

College of Arts and Sciences 1:00-4:00 pm, Second Floor Art Gallery

UNDERGRADUATE RESEARCH AND SCHOLARSHIP CONFERENCE PROGRAM COVER DESIGN

Kim Barker, Robert Barney, Shannon Barz, Amaya Bengoechea, Jodie Bernt, Beth Bricker, David Casey, Dustin Cavin, Tyler Cenarrusa, Nicole Coleman, Tahirih Commers, Dmitry Danilovitch, Emily Duckett, Leona Ellsworth, Jackie Elo, Heather English, Brian Evancic, Matthew Evans, Cameron Frey, Nicole Fulfer, Seth Hanson, Amy Howa, Heather Imlach, Maria Kauffman, Kailyn Lamb, Justin Logan, Hans Lohse, Brandon Michael, Kim Nelund, Chistopher Petersen, Brandon Salladay, Erin Smith, Kim Stockton, Thomas Volk, Lindsey Wagner, Cory Zubizareta (Department of Art) Tom Elder

Students in Art 204, *Graphic Design Studio II* were presented with a unique opportunity to design the program cover for the 2006 Undergraduate Research and Scholarship Conference. This is an example of a research project for a graphic designer. The student designers prepare themselves by researching the university colleges and many programs that are represented in the conference. Class instruction includes subjects in representation, semiotics and denotation of images as a way to present the concept for communication. Through use of peer and instructor review, each student developed their own design as a way to visually represent the conference. Some designers used metaphoric principles, others by use of a visual pun while some tried to capture the essence of the undergraduate research experience. This year's cover design was selected by a jury of graphic design faculty and conference personnel. Each cover design submission is displayed in the Student Union Building Gallery for the duration of the conference.

THE DISASTERS OF WAR

Kate Bowen, Colleen DeBolin, Erica Deshner, April Hoff, Lorin Humphreys, Angela Katona-Batchelor, Penny Key, Tiffany Kimball, Denise Lauerman, Amy Nack, Stephanie Oster, Tom Volk (Department of Art) Jill Fitterer

Spanning four centuries, the prints and drawings of Jacques Callot, Francisco de Goya, Otto Dix, Käthe Kollwitz, and Nancy Spero have confronted the brutal realities of war. While their imagery is often difficult to consume, the engagement with it puts the viewer face to face with what are referred to as the "collateral damages" of war. Responding to the current war in Iraq, Afghanistan and civil unrest in Africa, participating printmakers sought inspiration from the masters listed above. Commenting on the complex issues surrounding war, some areas of research include; torture, death, sacrifice, patterns of killing, orphans, children armed with weapons, wounds, censorship, transformation and hope. Connected through process and content across centuries, the work from *Goya's Disasters of War* continues to be timely. A critical cog in the social wheel, the artist's diverse perspectives address topics to consider, draw attention toward, rebel against, reflect upon, promote discussion and motivate change.

INFORMATION GRAPHIC: FREEDOM OF INFORMATION ACT

Anthony Bachman, Brett Baltzer, Anna Burks, Sean Cross, Jane Dater, Derek Edgar, Naomi Ferree, Sarah Gridley, Erica Haney, Jennie Jorgensen, Tamar King, Jennifer Lara, Katie Luke, Greg Marshall, Jason Martinez, Steve Norell, Will Oberleitner, Laura Sanders, Megan Smith, Clint Stonich, Kyle Struchen, Sarah Talbert, Kimberly Taylor, Lindsay Ward, Aubrey Watkins, Theresa Worl (Department of Art) Stephanie Bacon

An information graphic orchestrates text, statistical information and visual elements in such a way that the result is more than the sum of its parts. In an effective information graphic, text and image work in tandem to convey information more clearly and more vividly, in a more immediate, detailed and more memorable way, than if the information were conveyed in exclusively verbal or exclusively visual terms. No visual element in information graphic is extraneous or decorative; each element should be in some way informative to the viewer. In this project, students in *ART 118 Digital Tools for Graphic Design and Illustration* researched statistics and factual data relating to the Freedom of Information Act (FOIA.) Their presentations, which are designed to inform the general audience about the FOIA, were created using vector-based software.

– Special Features –

Classical Guitar Presenters

JACOB INECK

Jacob Ineck began studying acoustic guitar from his sister in fourth grade before transitioning to the classical guitar with the Childbloom Guitar Program under the guidance of Kelli Larson. He won several Childbloom national competitions within that time. He received four consecutive superior ratings at the annual National Federation of Music festival. Five years later, he began taking lessons from Dr. Joseph Baldassarre, with whom he has been studying for four years. He is currently a sophomore at Boise State, majoring in Music Performance and Music Education. He was featured as the fretted strings representative for the Chair's Honor Recital 2005 and 2006. He will be playing a guitar concerto with the BSU Symphony Orchestra on May 7 of this year. Apart from classical guitar, Jacob is a music minister and leader of the Life Teen Music Group at St. Mark's Catholic Church. He also fronts a four-piece jazz/rock band called The Middle Income Household Band. He played string bass with the BSU orchestra and now sings in the BSU Meistersingers ensemble.

DEREK WARREN

Derek Warren began playing the piano at age of eight and the guitar at age of twelve. He played the guitar in his high school's jazz band and performed in festivals in Denver and Portland. Derek received a Bachelor's degree from Boise State University in August of 2005 and is currently completing a Master's degree in Music at Boise State. He has been featured twice in the BSU chair's honor recital. Derek was a featured performer with the BSU University Singers and is in the upcoming performance with the BSU orchestra in the musical Kiss Me Kate. He has performed in the master classes of Jason Vieaux, David Burgess, Michael Partington, Paul Grove, James Reid, and Matt Greif. Upon completion of graduate school, Derek plans on continuing his education in a P.H.D. program in Music History with an emphasis on Historical Performance Practices.



– Media in Action –

COLLEGE OF SOCIAL SCIENCES AND PUBLIC AFFAIRS

2:00-3:00 P.M., LOOKOUT ROOM

Dr. Mark Shevy, Department of Communication, Discussant

"Media in Action" showcases exemplary video production work created by students in the Department of Communication, College of Social Sciences and Public Affairs. Each student producer provided an artist's statement and personal reflections of her or his work.

LINES

Colin Clark (Department of Communication) Robert Rudd

"Lines" illustrates an attempt to reveal the infinite definitions any particular statement may contain through visual representation. A line is arbitrarily defined as "a geometric figure formed by a point moving along a fixed direction and the reverse direction." The beginning point of the line, tool of creation and end of the line (if any) remain limitless. By using over seventy layers of cropped color mattes, a permanent line continues to create complex geometric shapes throughout multiple frames of an inestimable vacant dimension paralleled only with corresponding text.

WHO'S NEXT?

Shannon Dee (Department of Communication) Robert Rudd

"Who's Next" is an invitation to look with greater depth, ultimately playing with and being played by the stimulus before us. The idea was to create an art gallery setting and have an art viewer literally get inside a piece of work. I used an 8"x10" batik as the art work, filming it in front of back-lit glass, giving it a luminous quality as well as showing the texture of every thread in the fabric. That image was then used as the background to the keyed moving image. It appeared to be some kind of massive internally-lit screen. Effects were applied to achieve the surface manipulations and an extreme zoom-in to get the grid of threads when "inside" the art work. The music and movement as she moves her arms describes a playful experimentation and self-creation of experience, available to anyone who cares to really let oneself go and get "into" anything.

MEDIA IN ACTION

Matt Dewey (Department of Communication) Robert Rudd

Today we all understand, of course, the important role that the media, in all forms, have in implicitly and explicitly designing the type of culture and political atmosphere in which we associate. Not only does the power of the media promote and determine the acceptance and fruition of ideas and methods of interaction, they constitute a tool for distributing and reinforcing the basic emotional and logical connections in our conscience; connections we continuously use to assign individual and social value and ideal to those ideas and interactions. Given media's innate hegemonic authority, it is the responsibility of those in the position, or those willing to assume such positions, to create the types of media we consume in a manner that is specifically of a socially conscious nature in message, and of content that not only serves to educate its viewer socially, but enlists the necessary dialogue for the interaction and association of all types of ideals and values unbound by degrees of social, economic, and political power. The exercises that encompass Media In Action are efforts to reinvigorate the all-too-often tired and passive process of media consumption, and by the careful initiation of content and structure, form a more explicitly active type of media.

Thanks to Matt Dewey, whose "Media in Action" title captures the essence of this program.

COLLEGE OF ARTS AND SCIENCES

SEQUENCING HUMAN MITOCHONDRIAL DNA FROM IDAHO'S BASQUE POPULATION

Ericka Anderson (Department of Health Sciences) Greg Hampikian

The origin of the Basque people remains an enigma. In order to study this question, we are examining two hypervariable regions of mitochondrial (mt) DNA from people of Basque heritage. Ninety eight samples have been taken by buccal swabs (inner cheek) from the local Basque population, and the HVI and HVII regions will be PCR-amplified and sequenced to look at sequences unique to the Basque population, and to determine the haplotype frequencies within the group. Studying the sequences of these regions of mtDNA can help us to determine biogeographic migration of the Basque population.



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APPLICATIONS OF GAME THEORY IN CALCULUS AND INFORMATION SECURITY

Wenyi Dai (Department of Mathematics) Marion Scheepers

People use game theory in many different areas, especially in business and mathematics. In game theory, people are most interested in strategies: How to use a strategy to win a game? (Is the strategy a winning strategy?). When there are different winning strategies are some more efficient than others? “Continuity” is one of the most important concepts in calculus. There is a game, the continuity game, played by two players. We will investigate which of the two players, if any has a winning strategy. In e-commerce encryption is used to protect information. Companies want their online services to be user friendly. The desires for protection and for user friendliness are sometimes conflicting. There is a game, played between two players, which exploit this conflict. We will look at how successful this game is in defeating the encryption protection.

ANTI-MICROBIAL AND ANTI-BIOFILM EFFECTS OF NUCLEOSIDE ANALOGS

Cassie Dayan (Department of Biology) Kenneth Cornell

Drug resistance has increased over the past years, reducing the effectiveness of many antibiotics. The Methionine Salvage Pathway contains several steps unique to many disease-causing bacteria. This makes it an ideal pathway to target with new antimicrobial compounds. The enzyme methythioadenosine/S-adenosylhomocystine (MTA/SAH) nucleosidase plays a central role in the recycling of methionine, adenine, and the production of autoinducer 2 (AI-2). AI-2 partially controls the bacterial production of virulence factors and biofilm formation. Bacterial biofilms are formed to protect the microbes from the surrounding environment. Reducing biofilm formation can increase the sensitivity of bacteria to antibiotics and reduce chronic infections. In an effort to show the potential of this pathway as a target for novel antibiotic design, three substrate analog inhibitors of MTA/SAH nucleosidase were designed. The analogs were examined for their effects on bacterial growth and AI-2 mediated biofilm formation. Inhibition of microbial growth was observed with all three analogs.

SEPARATION AND CHARACTERIZATION OF LIPOPHILIC PROTEINS BY ELECTRICAL FIELD FLOW FRACTIONATION (EFFF) IN NON-POLAR FLUID

Markus Degirmenci (Department of Biology) Dale Russell

Isolating and characterizing membrane bound proteins is a frontier area of biomedical research. With the era of proteomics, the characterization of integral membrane proteins, such

as channels, transporters, and receptors, is critical in understanding fundamental functions of many biological processes. This has important biomedical applications, since many drug targets are integral membrane proteins. We report protein separation with non-polar Electrical Field Flow Fractionation (EFFF). Retention of the proteins in the channel can be obtained through coupling with the imposed field; differences in retention time correlate to diffusivity and electrophoretic mobility of the proteins. Fundamental characteristics of an individual protein can be calculated from the retention data. Molecular mass and size of proteins are determined using MALLS detection. Collected fractions will be run on an SDS-PAGE gel to show protein separation and enzyme kinetics will be used to show that proteins remained in their native conformation during the separation process.

CRYPTO SYSTEMS IN CILIATES

Nikki DeWane (Department of Biology) Marion Scheepers

Ciliates are single cell eukaryotes found in the Kingdom Protista and Phylum Ciliophora. Ciliates have two types of nuclei: the germ line nucleus (or micronucleus), which is transcriptionally silent and the somatic nucleus (or macronucleus), which is transcriptionally active. The number of each type of nuclei present varies among ciliate species. During development of the macronucleus from a micronucleus, several DNA editing events take place. The development of the macronucleus from the micronucleus is a decryption process. The objective of this study is to investigate the unique properties of the nuclei arrangement by analyzing transformation of a micronucleus to a macronucleus.

Experiments have been designed to determine the encryption/decryption algorithm for a given species by constructing a model for the gene-by-gene encryption and decryption algorithms from the experimental data. We will use micronuclear transplant techniques to investigate if different ciliate species to determine if they share the same or similar decryption technology.

DEVELOPMENT OF NOVEL AFM FOR BIOLOGICAL STUDIES

J.J. Durant (Department of Physics) Byung-Il Kim

In the life sciences, it has long been a dream to view the nanometer-scale dynamic behavior of individual bio-molecules, such as proteins, in solution. Bio-molecules perform very specific and sophisticated physiological functions. These physiological actions are determined by a very specific 3-dimensional structure of bio-molecules in action. Knowledge of the bio-molecular fine structure with atomic resolution is essential for understanding the physiological function. Atomic force microscopy (AFM) has made it possible to view living bio-molecules with atomic resolution in physiological environment. We have developed a novel AFM specifically for this purpose. This AFM can be adapted for studies of biological systems, atomic and molecular structure, and both atomic and molecular forces. Specifically, we can use this instrument for the study of interfacial forces between molecules in their natural physiological environments.



NEAR INFRARED OBSERVATIONS OF THE GAMMA-RAY BURST 050820A AFTERGLOW

Jessica Elias (Department of Physics) Daryl Macomb

A gamma-ray burst (grb) is a brief, bright explosion releasing roughly the same amount of energy as a supernova. The grb spectral intensity after the initial burst evolves into a steady but somewhat complex decline; moving from the initial gamma-ray energies down through the X-ray, ultraviolet, visible, infrared and so on. This fading multi-wavelength light is what is known as the afterglow. As part of our research program to study the optical afterglows of gamma-ray

bursts at BSU's Challis Observatory, we have participated in infrared observations using the Wyoming Infrared Observatory (WIRO). This poster describes the physics of grb afterglows with an emphasis on detailed lightcurve of the infrared afterglow decay of GRB 050820a.

EPISTEMIC DILEMMAS OF RAPHAEL'S SCHOOL OF ATHENS

Shane Girard (Department of Art) Lee Ann Turner

Podium Presentation

Raphael's fresco in the Stanza della Segnatura has continued to be subject to a multitude of discursive debates among art historians to this day. The enigmatic nature of this painting provides exemplary insight of the idealistic paradigm of which art historians scrupulously endeavor to assess when analyzing works that succumb to uncertainty. Such quandaries are disclosed in my paper on the essentiality of epistemic problems which are presented to art historians. My paper evaluates historical and contemporary accounts of explanations regarding specific aspects of Raphael's School of Athens. Such explanations provide examples of epistemic perplexities that exist in accounting for works of art with a dearth of textual evidence as is the case with the School of Athens. My argument is whether such analyses are formed from justified true belief or absolute knowledge. I conducted my research for an art history class on methods and theory in art history.

UNIVERSAL INFLUENCE

Hailey Hays, Katie Ponozzo, Amie Wingert, Jennifer Waters, Gonzalo Valdez, Molly Beardmore, Sarah Nielson, Lesley Uehling, and Brittany Gardner (Department of Theatre Arts) Marla Hansen

Performing Arts Session

After studying an array of movement from various technical and global areas, the choreography study Universal Influence, is a melting pot of genres wrapped into one. Mediums that have spurred this piece include influences from cultures such as Chinese, African, Indian, and American, as well as dance genres including modern, jazz, and ballet. The Turkish Belly Dance music is performed by drumming only, and though it is a single instrument, it goes through a variety of rhythm, beats, and movements to bring about a full sound that you can't help but move your body to.

SINGLE MOLECULAR ANTIBODY-ANTIGEN INTERACTIONS STUDIED BY ATOMIC FORCE MICROSCOPY

Joe Holmes (Department of Physics) Byung-Il Kim

Atomic force microscope (AFM) was used to study the antibody-antigen recognition at a single molecular level, an important issue in the immune defense system. Using AFM force-spectroscopy, the interaction between IgG2A antibody and MTAN, an E. coli derived protein, were investigated at the single molecular level in the biological environment. A flexible PEG cross-linker was used to reduce the steric hindrance in the single molecular interactions. More than one hundred measurements showed single ruptures and sequential ruptures during retracting the antibody from the antigens, suggesting monovalency and polyvalency. Histogram analysis showed that the most probable unbinding forces are 88 pN and 692 pN, indicating two dominant binding sites in the IgG2A-MTAN system. It also showed that the unbinding forces 440pN, 880pN, 1320pN, 1760pN, ... and so on, representing the simultaneous multiple unbinding events. The single molecular force spectroscopy provides a new insight on the single molecular antibody-antigen recognition.

STOPPING BACTERIAL "GOSSIP"

Chelsea Isom (Department of Chemistry) Kenneth Cornell

Enzymes in the methionine salvage pathway are a target for antimicrobial drugs because the mammalian cells and the bacterial pathway are different. The mammalian cells use a single enzyme to phosphorylate 5'-methylthoadenosine (MTA) while the bacterial pathway uses two

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enzymes to accomplish the same phosphorylation 5'-methylthioadenosine nucleosidase (MTAN) and 5'-methylthioribose Kinase (MTRK). In bacteria the methionine salvage pathway allows the recycling of methionine from polyamine and methylation products MTA and S-adenosylhomocysteine (AdoHcy) and also leads to the production of the quorum sensing molecule Autoinducer-2 (AI-2). Quorum sensing molecules allow bacteria to "gossip" with each other and coordinate processes like virulence and biofilm formation. The transition state analog inhibitors (BCX, BCY) were examined for their effects on enzyme activity, biofilm formation and bacterial growth. These initial studies showed that these compounds were potent inhibitors of enzyme activity, and caused a decrease in biofilm formation and a delay in bacterial growth.

CLONING CARBONYL REDUCTASE GENES FROM HUMAN, RABBIT, RAT, AND MOUSE HEART

Tamara Kelly (Department of Chemistry) Henry Charlier

Anthracycline compounds are used to treat a variety of cancers. Despite their benefit, anthracycline treatment is linked to the development of a potentially lethal cardiotoxicity. Though the mechanisms accounting for the cardiotoxicity are not well known, alcohol metabolites of the anthracyclines are believed to be the causative agents. The parent anthracyclines are converted to the cardiotoxic metabolites by NADPH-dependent carbonyl reductase (CR). Studies in mice have shown that the risk of developing anthracycline-induced cardiotoxicity is increased when CR levels are high. Currently anthracycline cardiotoxicity models have been developed in mice, rats, and rabbits, however, very little is known about the mechanisms of anthracycline reduction by CR isoenzymes from these species. It is the goal of this work to clone, express, and kinetically characterize CR from rabbit, mouse, and rat heart. Strategies for cloning CR genes from these species will be presented. (Supported by NIH/NCRR P20-RR16454 and NIH R15-CA102119-01.)

MECHANISTIC AND KINETIC INVESTIGATION OF MANGANESE SALEN COMPLEXES BY UV/VIS SPECTROSCOPY, THE MEASUREMENT OF OXYGEN EVOLUTION, AND DENSITY FUNCTIONAL CALCULATIONS

Brett Keys (Department of Chemistry) Jeffrey Peloquin

The role of manganese complexes in the detoxification of reactive oxygen species (ROS) has been investigated. Manganese salen complexes were synthesized and analyzed by UV/Vis spectroscopy. The reactivity of the complexes was quantified via the measurement of the amount of oxygen produced by the complexes following reaction with hydrogen peroxide. Results indicate that bicarbonate does not have a significant effect on the oxidative properties of manganese salen complexes but the pH does have a measurable effect. Finally density functional calculations give insight into the spin state and geometry of manganese salen complexes while interacting with ROS.

19TH CENTURY CLASS IDENTITY DEMONSTRATED IN THE WORKS OF BAUDELAIRE AND MANET

Jenaleigh Kiebert (Department of Art) Janice Neri

Podium Presentation



This research compares the works of writer Charles Baudelaire and Edouard Manet and examines similar themes represented in their works. These themes relate to events and culture of France in the mid to late 19th century such as class division, changes in the economy, and the reconstruction of Paris. Changes such as this greatly affected the way people were to interact with one another and how public spaces would come to be viewed. Conflicting treatments of modernity and representations of modern life in the works of Manet and Baudelaire reflect the anxiety of personal identity and class

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definition experienced by many 19th century Parisians as well as the artists' own struggles with modern issues and investigating their own identities in a modern society.

STILL LIFE: OBJECT AND THEME IN 17TH CENTURY FRANCE

Jenaleigh Kiebert (Department of Art) Janice Neri

Podium Presentation

While the genre of still life paintings is often admired for proximity to reality, attention to detail, and demonstration of artistic skill, further examination reveals that there is much to be learned from these paintings as they often reflect themes and values of the culture from which they come. This body of research examines still life paintings from 17th century France, with emphasis on the objects represented in the works. The value of these objects, such as goblets, globes, books, hunting implements, etc. in French society of this era will be discussed as a means of interpreting the importance of their depiction in works of art. Lastly, it will determine whether a particularly French style of still life exists for this era or whether the works from France are simply following the themes and style of their predecessors from other regions.

PUBLIC ART IN ART EDUCATION

Odessa Kirk & Katie Jo Rupert (Department of Art) Kathleen Keys

Developed within parallel independent studies in Fall 2005, Kirk & Rupert explored the potential for creating educational support offerings to compliment the ongoing school tours of public art in Boise City sponsored by the Boise City Arts Commission (BCAC). Initial curriculum ideas for bringing these artworks into the classroom were also explored. Following research efforts within the existing BCAC public art programs and field testing tour ideas with high school students, research produced by Kirk & Rupert included a self-guide tour packet of Boise City public art for use by K-12 educators in planning class tours and a power point presentation study guide/resource including historical and cultural information about the public art works for use in developing public art units of study. Both the tour packet and the power point study guide/resource will be available for viewer perusal, and the researchers will be available for comments and questions.

ENSO AND SNOWMELT TIMING IN IDAHO

Melvin Kunkel (Department of Geosciences) Jen Pierce

The Idaho mountain snowpack acts as a long-term water reservoir for Idaho. Snowpacks build up in the winter and slowly release water into rivers and lakes throughout the spring and summer. Climatic changes such as El-Niño-Southern Oscillation (ENSO) influence long-term snow storage. Initial results from an examination of the effects of ENSO on Idaho snowpacks indicates ENSO affects all Idaho's snowpacks, but most greatly affects sites that typically maintain snow the longest. Preliminary examination of SNOWTEL snowmelt data indicates that during El Niño years, generally warmer and drier conditions in the Pacific Northwest result in earlier snowmelt dates in Idaho, while the inverse may be true during wetter and cooler La Nina years. Since depth of snowpack and timing of snowmelt influences the timing and magnitude of peak flow events, variations in snowmelt are linked to streamflow conditions and have implications for Idaho's water supply, native fish populations and economy.

SCENE DESIGN FOR WILLIAM SHAKESPEARE'S MEASURE FOR MEASURE

Joseph Lavigne (Department of Theatre Arts) Gordon Reinhart

This poster will present the process of creating the set design for the theatrical production of the play Measure for Measure by William Shakespeare. Beginning with initial play responses and leading toward a scenic model and a realized set, the author will address the various stages that a scenic designer goes through in creating a finished scenic design.

COMPARATIVE ANALYSIS OF GENETIC LOCI INVOLVED IN FIBROMYALGIA

Kristen Leenhouts (Department of Biology) Greg Hampikian

No single chromosomal location has been associated with the disease fibromyalgia. However, several studies suggest a role of the X-Chromosome due to the observed inheritance pattern (What is Fibromyalgia Syndrome (FMS)?). Other sites have also been implicated, and several seem to have overlapping functions. METHODS: Using various resources; i.e. Internet, published journals, etc., a register of possible genetic loci involved with the disease fibromyalgia was compiled to examine the link between various genes and fibromyalgia. Identified sequences were analyzed based on chromosome location, genetic content, protein function, and various other criteria. Loci were ranked on similarity and their possible role in the disease fibromyalgia. RESULTS: Study is on-going and formal results are being compiled. CONCLUSION: The levels of statistical significance linking candidate genes and fibromyalgia are discussed, and a comparison of candidate sequences is presented.



SYNTHESIS OF THIOPHENE DERIVATIVES AND PRELIMINARY INVESTIGATIONS OF POLYTHIOPHENES AS CHEMICAL SENSORS

Christopher Liby (Department of Chemistry) Don Warner

Thiophene-based monomers are being investigated for their potential application as chemical sensors. We hypothesize that these sensors have important applications for the detection and monitoring of environmentally hazardous chemicals. It is essential that the monomer can be readily synthesized, amiable to derivatization, and easily polymerized. Furthermore, upon polymerization, the resulting polymer must have conductive properties. Additionally, the polymer must resemble and approximate the target analyte. During detection studies, binding of an analyte will induce a change in the electrical properties of the polymerized sensor and generate a quantifiable signal. A number of target analytes will be studied; however our initial investigations have examined the organic compound benzene as the target of interest. To accomplish this, a molecular imprint that resembles the structural characteristics of benzene has been created. Significant progress has been made toward the synthesis of six thiophene monomer analogues. These and related results will be discussed.

BACTERIAL INHIBITION INDUCED BY SPICE EXTRACT AROMAS

Emily Madsen (Department of Biology) Greg Hampikian

The purpose of these experiments is to determine bacterial inhibition caused by the aromas of various spice extracts. The experiments will be conducted with a 96-well assay using various spice serial dilutions to determine the concentrations required for full, partial and no inhibition. Some spice extracts used thus far, including peppermint, oregano, and cinnamon bark, have shown strong inhibition at the single concentrations originally used in our lab. Other extracts have yielded variable results, for example rose absolute and wintergreen. Finally, several extracts have not shown any inhibition whatsoever: lemon, grapefruit and tangerine. Those extracts which yield variable results might be at a dilution that is close to the level of "no inhibition." Further dilution studies will determine the effective concentrations of the antibacterial agents.

IDENTIFICATION OF THE LNS-COLLAGEN FAMILY MEMBERS IN DANIO RERIO

Jeremiah Maschmann (Department of Chemistry) Julia Oxford

Zebrafish (*Danio rerio*) have become an increasingly popular organism for biological research. While the genome has been mapped out for this fish, specific gene locations coding for proteins have yet to be discovered. My research is limited to elucidating the locus of the genes

encoding LNS-collagens, such as Collagen (XI) alpha 1 chain. Determining the loci will help to better understand human deficiencies expressed by the alteration of these proteins. It is believed that the amino acid sequence which forms these proteins is highly conserved from species to species. This property enables comparison of a known sequence from a different organism, such as *Rattus norvegicus*, to a chromosome location on *Danio rerio*. The use of protein and DNA databanks on the World Wide Web, such as ExPaSy and Ensembl, accelerates finding, manipulating, and comparing genomic and protein sequences.

THE DEVELOPMENT OF TRANSURANIC AQUEOUS METAL ION SENSOR SYSTEMS

Noah Minskoff, Jon Scaggs, and Brian Cawrse (Department of Chemistry) Dale Russell

A new approach in developing environmental sensors for the detection of uranium in groundwater requires a series of organic reactions to achieve a covalent attachment between a binding site and the target molecule. Using electrochemical deposition the polymer is plated onto platinum micro-electrodes. An in situ set of organic reactions were carried out on the polymer surface to allow covalent attachment of 4-sulfonic calix [6] arene hydrate (C[6]A), a uranium binding ring with structure complementary to the uranyl ion (UO_2^{2+}). The polymer is a semi-conductor and the binding of C[6]A to the uranyl ion alters the conductivity of the polymer. The change in conductivity is correlated to the concentration of the uranyl ion present in the ground water being sampled. The polymerized micro-electrode is inexpensive, robust and small with sub parts per billion sensitivity. This has advantages over larger and more expensive methods currently employed to measure heavy metals in ground water.

CREATIVITY WITHIN CONFINEMENTS

Katie Ponozzo (Department of Theatre Arts) Marla Hansen

Performing Arts Session

For an up coming dance audition I must perform a two minute solo that shows all the strengths I have as a dancer. I must come up with unique and creative movements that will capture the judges' attentions while at the same time showing my technique and versatility. I found this to be a fairly difficult endeavor. For within the confines of two minutes I must create movements that define me as a dancer, I must show my strength, flexibility, turning ability, range of motion and range of emotion. So it is with this piece that I will be creative within the confinements that I am given.



INVESTIGATION OF Ca^{2+} INDUCED AGGREGATION OF CALSEQUESTRIN BY ASYMMETRICAL FLOW FIELD-FLOW FRACTIONATION (AFFF)

Randy Rostock (Department of Chemistry) Susan Shadle

Calsequestrin is a calcium-binding protein found in the lumen of the sarcoplasmic reticulum of skeletal and cardiac muscle. Functionally, it is involved in the uptake and release of calcium ions associated with muscular function. Calsequestrin binds calcium with a high capacity and low affinity ($20-80 Ca^{2+}/CSQ$ with an average K_d of 0.5 mM). This high capacity calcium binding is thought to require protein aggregation. The goal of our study was to investigate and characterize the Ca^{2+} induced aggregation of calsequestrin. Asymmetrical Flow Field-Flow Fractionation (AFFF) has been used, in conjunction with Multi Angle Laser Light Scattering (MALLS) AND Refractive Index (RI), to study calcium induced CSQ aggregation. A variety of conditions have been explored to elucidate the effect of ionic strength on protein aggregation.

GLYCOSAMINOGLYCAN BINDING TO THE HEPARIN BINDING SITE OF TYPE XI COLLAGEN

Stacie Sanderson (Department of Chemistry) Julia Oxford

In recent studies, researchers have elicited a binding site for the glycosaminoglycan (GAG) heparan sulfate on type XI collagen in the noncollagenous domain called Npp. This affinity is believed to be an important link between collagen XI and the extracellular matrix (ECM) which are components of cartilage. This particular study uses enzyme-linked immunosorbent assay (ELISA) to seek other possible GAG's found in the ECM that may interact with collagen XI. Sugar moieties being studied include dermatan sulfate, keratan sulfate, and chondroitin sulfate. The anticipated results of the experimentation will reaffirm the binding of heparan sulfate to the noncollagenous (Npp) domain and will show either affinity or no activity of the Npp domain with dermatan sulfate, keratan sulfate, and chondroitin sulfate. These results will be quantified with absorbance readings from the ELISA plates to obtain the dissociation constant (KD) of each of the sugars.

EVALUATING THE ROLE OF METHIONINE 234 IN SUBSTRATE RECOGNITION

Alina Schimpf (Department of Chemistry) Henry Charlier

Anthracyclines are effective anti-cancer drugs whose use is limited by their cardiotoxic effects. The cardiotoxicity has been linked to carbonyl reductase (CR) dependent reduction of the anthracyclines to their corresponding alcohol metabolites. Knowledge of how CR recognizes its substrates could be used to design novel anthracyclines that are not recognized by CR. Modeling studies done with CR revealed a close contact between methionine 234 and the anthracyclines. As such, methionine 234 could restrict the size of the substrate that CR can bind. Site-directed mutagenesis was used to replace the methionine 234 with the smaller amino acids alanine, cysteine and serine. These mutant CR enzymes are being expressed in and purified from *E. coli*. The catalytic efficiencies of each of the mutant enzymes will be measured using a variety of anthracycline substrates to evaluate the role of the methionine at position 234. (Supported by NIH/NCRR P20-RR16454)

COLON CANCER: A ROLE FOR ONCOSTATIN M IN TUMOR CELL PROGRESSION?

Tyrell Simkins (Department of Biology) Cheryl Jorcyk

Oncostatin M (OSM) is a pleiotropic cytokine in the interleukin-6 family and is produced by several cell types, including human macrophages, monocytes, and neutrophils. OSM exhibits both stimulatory and inhibitory effects on cell proliferation. However, recent research in our lab suggests that OSM may actually contribute to tumor progression and enhance metastatic potential. The research presented here is aimed at addressing the effects of OSM in colon cancer. We obtained three human colon cancer cell lines: LoVo, HCT-116, and T84, and these cell lines differ in the amount of OSM receptor (OSMR) they produce. Adequate amounts of cellular receptors are essential to elicit a response of any sort, and many important cellular responses are generated via cytokines such as OSM binding to these cell surface receptors. LoVo cells are reported to have essentially no OSM receptors, while HCT 116 cells show an abundance of OSM receptors. We are currently determining the amount of OSMR expressed by T84 cells. Our preliminary results suggest that OSM does not affect the proliferation and detachment of HCT116 and T84 human colon cancer cells. Experiments are underway to measure changes in the invasive capacity of these colon cancer cells in response to OSM.

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PYRAZOLOQUINONE SUBSTRATES AND INHIBITORS OF CARBONYL REDUCTASE

Andrew Slupe, Choice Luster, Oladapo Bakare, and Solomon Berhe (Department of Chemistry) Henry Charlier

Carbonyl reductase (CR) catalyzes the NADPH-dependent reduction of many carbonyl containing compounds, including anthracyclines. CR reduction of anthracyclines has been linked to both efficacy and cardiotoxicity associated with anthracycline anticancer therapy.

Inhibition of CR during anthracycline therapy offers the potential to both increase the effectiveness of the drugs and to decrease the risk of cardiotoxicity. Understanding the substrate and inhibitor specificities of CR is paramount to developing inhibitors that could be used clinically to improve anthracycline therapy. Several pyrazoloquinone compounds were synthesized and screened for biological activity with CR. Several of the compounds tested were found to be substrates with a wide range of catalytic efficiencies. Four compounds were found to be inhibitors with IC₅₀ values ranging from 3-5 micromolar. The pyrazoloquinones in this study represent a new class of substrates and inhibitors for CR and offer insights into the design of potential inhibitors. Supported by NIH/P20RR016454 and NIH/R15CA102119-01.

JAMES CASTLE: TOTEM

Mardie Stone (Department of Art) Janice Neri

Podium Presentation

James Castle (1899-1977), a deaf, mute, self-taught artist quietly working in isolation mastered the art of perspective without the benefit of an education or artistic training. The majority of his subject matter is straightforward, but some of his drawings have an unusual aspect to them which numerous curators and other professionals have labeled "totems." Scholars have not been able to explain why Castle placed these seemingly disassociated objects in his landscape, interior architectural and architectural drawings. By using a theoretical approach of semiotics, I have presented the argument that James Castle used the totems as a measuring device towards the development of perspective. Upon the mastery of perspective the totems, no longer useful, disappear from his drawings.

CONSTRUCTION OF VECTORS TO PRODUCE CHOLERA TOXIN CHIMERAS AS POTENTIAL VACCINES

Tabitha Sturges (Department of Biology) Juliette Tinker

Vibrio cholerae is the bacterial agent of the disease cholera. This study involves the engineering of a plasmid using a native *ctxB* leader to express cholera toxin chimeras in *Vibrio cholerae*. Studies indicate that the *Vibrio cholerae* toxin (CT) is an adjuvant producing strong immune responses. The *ctxB* leader of *V. cholerae* will direct the chimeras to the type II secretion system allowing purification from the supernatant. In this experiment, we will clone in *tcpA* into our plasmid containing the *ctxB* leader. The goal of this experiment is to produce and purify the chimera (TcpA-CTA2/CTB) in large enough quantities to test in mice to see if it confers immunity to cholera. Ultimately we are trying to find out whether or not this chimera can be used as a vaccine against *Vibrio cholerae*.

FERROMAGNETISM IN CHEMICALLY SYNTHESIZED CeO₂ NANOPARTICLES BY Ni DOPING

Aaron Thurber (Department of Physics) Alex Punnoose

Metal oxide materials have recently been the subject of intense research since the discovery of room-temperature ferromagnetism in dilute semiconducting metal oxide systems for applications in spintronics. CeO₂ is a widely used rare earth oxide in fields of catalysis, optical

coatings and electrolysis, but more recently has been a candidate for use in field-effect transistor devices, a dielectric in capacitors and as a buffer layer in silicon-on-insulator technologies. The wide array of possible applications available for this system makes it very attractive for study and use in spintronics. This work reports the discovery of ferromagnetism in the cubic metal oxide insulator system $\text{Ce}_{1-x}\text{Ni}_x\text{O}_2$ for $0.0022 \leq x \leq 0.0440$ with particles in the 8 – 14 nm range. Particle induced X-ray emission (PIXE), magnetometry, x-ray diffraction (XRD), transmission electron microscopy (TEM), electron diffraction (EDP), and diffuse reflectance were used to characterize and study the magnetic, structural, and optical properties of samples.

COMPARISON OF ROBOTIC AND STEP-WISE SPIN COLUMN DNA EXTRACTION TECHNIQUES UTILIZING THE QIAGEN EZ-1 BIOROBOT

Alex Urquhart and Michael Davis (Department of Biology) Greg Hampikian

The Qiagen EZ-1 Biorobot uses a magnetic silica bead solution to perform DNA purification. In theory this method should be as effective as traditional spin column elution technique of DNA extraction, and since 6 samples can be run at a time, may improve throughput of samples. Other benefits may include limited sample loss and increased purity of the extracted DNA. This project focuses on comparing the traditional technique of spin column filtration elution with the robotic magnetic bead purification for throughput, ease, quality and quantity of obtained DNA from samples collected via buccal swab.

PURIFICATION OF A FIMBRIAL-CHOLERA TOXIN CHIMERA FOR USE AS A POTENTIAL VACCINE

Elizabeth Villanueva (Department of Biology) Juliette Tinker

TcpF is a secreted protein from *Vibrio cholerae*. Antibodies directed against this have been found to be protective in the mouse model. By joining TcpF with the cholera toxin CTB subunit to form a chimera, we hope to increase immunity. The goal of this experiment is to produce high amounts of TcpF chimera to generate antibody production in adult mice and to see if it will protect infant mice against cholera infection. In this experiment, we will use protein expression to try and optimize TcpF chimera expression. We will be working with two plasmids that utilize different secretion pathways; pJKT85 and pJKY86. pJKT85 utilizes that Tat pathway and a TorA leader sequence. pJKT86 contains a leader sequence, LTIIb, which directs proteins through the general secretory system in *E. coli*.

RUN FREE

Jennifer Waters (Department of Theatre Arts) Marla Hansen

Performing Arts Session

You don't have to agree with those around you. Express yourself in your own way by following your heart. "Run Free" is a visual expression of feelings through the medium of a human being, dancing freely and showing physical strength as well as emotional. Expression is not easy, especially when others may not agree with what you say. In this piece the words are taken from music and transferred in the mind to become one energy exerted through motion. Dare to be free.

ENHANCING THE FERROMAGNETISM IN DILUTE MAGNETIC SEMICONDUCTOR $\text{Sn}_{1-x}\text{Fe}_x\text{O}_2$

Jill West (Department of Physics) Alex Punnoose

Recent studies have shown room-temperature ferromagnetism in SnO_2 by doping with various transition metal ions. The use of sol-gel chemical synthesis has been used to introduce high levels ($x \leq 0.25$) of Fe into the SnO_2 system. Nanoparticles of $\text{Sn}_{1-x}\text{Fe}_x\text{O}_2$ have shown good reproducibility and a high Curie temperature making it attractive for spintronics applications. It has been theorized that magnetism in diluted semiconductor oxide systems is directly related

to carrier concentration. This work reports on the solubility limit of Fe in SnO₂ and shows the optimal level of doping for stronger magnetism. Additionally, SnO₂ has also been doped with Sb as a means of altering both the electrical and optical properties of the system, and to study the effect of simultaneously introducing Sb and Fe into the metal oxide semiconductor.

EFFECTS OF THE 1994 RABBIT CREEK FIRE ON STREAM FISH DIETS: ELEVEN YEARS LATER

Joshua White and Cindy Valdivia (Department of Biology) Peter Koetsier

We examined fish gut contents collected from 9 headwater streams, some whose watersheds were burned by wildfire. We placed streams into 3 categories: unburned, burned, burned/blowout (episodic, post-fire scouring). We assessed riparian cover by measuring photosynthetically active radiation (PAR). We removed 9-15 fish digestive tracts per stream. We partitioned contents into 4 groups: terrestrial, aquatic invertebrates; unidentified organic matter; inorganic material. Invertebrates were identified, and all material types were dried and weighed. Our blowout streams had higher PAR than the others. Fish from these sites ingested higher percentages of aquatic, but not terrestrial invertebrates. Gut contents from unburned and burned sites had similar percentages of aquatic and terrestrial invertebrates, but less organic matter. Riparian canopy in blowout sites were less than control or burned streams, 11 years after the wildfire. Lacking a close canopy, terrestrial invertebrates were not a major item for the fish, possibly affecting their production or growth.

IMMUNOHISTOCHEMICAL EVALUATION OF COLLAGEN TYPE XI IN SKELETAL DEVELOPMENT

Luke Woodbury (Department of Biology) Julia Oxford

Type XI collagen is a minor constituent of the extracellular matrix of cartilage and is essential in the regulation of collagen fibril assembly and diameter. The $\alpha 1$ chain of Collagen XI ($\alpha 1$ CollXI) contains a variable region that is modulated by alternative splicing in a tissue-specific and developmental manner. In the absence of CollXI, collagen fibrils of developing cartilage are very large in diameter, resulting in a loss of structural integrity. This loss of organization leads to Chondrodysplasia, which is evident in the short broad long bones and abnormal cartilage of the chondrodysplastic mouse. Recently, the Col11 $\alpha 1$ 6a-8 mouse, lacking the variable region of $\alpha 1$ CollXI has been developed. Investigation of these mice, through immunohistochemistry, may further elucidate the role of $\alpha 1$ CollXI and the variable region in the establishment of the collagen fibril network and healthy tissue. In addition, this may contribute to the understanding of skeletal disease such as osteoarthritis and osteoporosis.

– Education –

COLLEGE OF EDUCATION

EXPEDITIONARY LEARNING: A QUALITATIVE STUDY

Brandi Bailey (McNair Scholar) (Department of Education & Social Science) Leslie Martin

Podium Presentation

Expeditionary Learning Outward Bound (ELOB) is a model of learning that encourages students to be active participants in their quest for knowledge. Many charter schools have adopted ELOB as the model through which students learn content. The existing literature demonstrates that more research is needed to conclude if this model is helping previous struggling learners succeed. The intent of this research is to study specifically if the ELOB model is changing students' attitudes towards learning. For this qualitative study, two students new to an ELOB environment, their parents and teachers were interviewed. Students were also observed in their classroom three times. The conclusions from this research demonstrate how ELOB can be an effective model for previously unsuccessful learners and what within the model can still be improved.



WHAT 8TH GRADERS THINK ABOUT DIFFERENTIATED INSTRUCTION

Bud Lancaster (Department of Special Education) Melinda Lindsey

Direct observation of a group of 30 8th graders and a selected response survey were used to try to understand what students thought of differentiated instruction. Student work was also evaluated and surveyed. This was the first time this teacher and these students had ever used differentiated instruction. The strategy of differentiated instruction was explained to the students at the beginning of the year. The students were given two assignments using differentiated instruction, one in literature and the other in American History. Student attitudes toward the strategy were generally positive. Students overwhelmingly approved of being given a choice in how they are instructed. Students were also given the opportunity to express their opinions about differentiated instruction. The teacher was given a different survey to ascertain her opinion of differentiated instruction. Student responses to survey questions were calculated using a spreadsheet program and data is reported in percentages of student responses.

UNDERSTANDING 3RD GRADE STUDENTS' IDEAS OF GEOMETRY

Nanette Lehman (Department of Curriculum, Instruction and Foundational Studies) Jonathan Brendefur

Students have a difficult time learning geometry and measurement concepts in elementary school. With this in mind I developed a geometry third grade unit. My working hypothesis was to allow students to use manipulative materials as learning tools rather than having the teacher merely utilize them to demonstrate mathematical ideas. I wanted to understand whether students would increase their understanding of these concepts by creating an educational environment where students communicated mathematically and used manipulatives to build conceptual understanding. I constructed a three-week unit that addressed what the research literature said were the areas of concern. In addition, to build multiple connections and reach more learners I integrated ideas of art, language arts, and writing. I gave a pre-assessment, taught the unit, and concluded with a post assessment to analyze students' understanding. Overall, students made huge gains, especially at-risk students and by the end all were able to generate conjectures regarding polygons.

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IMPACT AND PUSH-OFF FORCE SYMMETRY IN DOMINANT VERSUS NON-DOMINANT LEGS DURING A JUMP LANDING/CUTTING TASK

L. Rosado (McNair Scholar), M. Bennett, S. Kuhlman, & D. Clark (Department of Kinesiology & Center for Orthopedic and Biomechanics Research) C. Harris & M. DeBeliso

The purpose of this study was to assess the symmetry between dominant and non-dominant legs for the impact and push-off kinetics of an unanticipated jump landing and cutting task (JLC) Nine female subjects, all right leg dominant, were required to do a two-footed landing and then cut either to the right, center, or left using her preferred cutting style. Comparisons between legs for the 3 cutting conditions were made using ANOVA with repeated measures and post-hoc comparisons with t-tests. Of the three conditions assessed for the JLC, the more extensive the cut to the non-dominant side, the greater the impact and push-off force on the dominant leg compared to the non-dominant leg.



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COLLEGE OF ENGINEERING

GRAIN GROWTH SIMULATIONS OF COPPER

Thomas Anderson (Department of Materials Science and Engineering) Megan Frary



Most metals, when exposed to high temperatures for extended periods of time, undergo grain growth, which can lead to lower strength. However, metals that have been processed by grain boundary engineering have shown slower grain growth. Grain boundary engineered metals have also proven to be more resistant to creep, corrosion, and cracking. To investigate the resistance to grain growth in these materials, Monte Carlo simulations are being used to simulate grain growth of copper using experimentally determined grain orientations as an initial condition. Results indicate that grains with low energy grain boundaries are less likely to grow, because as the overall energy of the system decreases, the higher energy boundaries migrate first, leaving the low energy boundaries. Therefore grain boundary engineering is being proven to be effective in preventing grain growth.

HEADING AND THE IMPACT OF SOCCER BALLS

Kyle Antonini, Brandon Chaffin (Department of Mechanical Engineering) Anthony Paris

Podium Presentation

The issue over whether heading soccer balls causes head and spinal injuries has been an ongoing debate among researchers. In order to understand the probable effects of such impacts, it is necessary to understand the mechanics of the causes. To simulate a person heading a soccer ball, a ball is dropped from various heights directly on top of a rigid sphere of equal radius that has been fixed to a metal rod attached to a metal plate. The sphere apparatus rests on a force plate, which records the force-time relationship during impact. Theoretically, it has been shown that the results are dependent upon the mass, radius, air pressure, and velocity of the ball if it is assumed to be a thin membrane. To verify the model, the experimental results are compared with the theoretical results.

DEPOSITION OF THIOLATED COLLAGEN MOLECULES ONTO GOLD SURFACES

David Araujo (Department of Materials Science and Engineering) William Knowlton

Collagen provides the important structural network for cells and tissues throughout much of the vertebrate body. Its properties are of interest to biological and material scientists. Collagen forms a flexible rod or fibril that is mechanically tough and elastic as the main component of cartilage, ligaments and tendons, and most prevalent protein of bone and teeth. Collagen is formed by the assembly of triple helical collagen monomer (~1.5nm x 300nm) into thin fibrils (~7.5nm x >1500nm) that continue to assemble into larger fibers (~200–1000nm in diameter). Our goal is to develop the ability to manipulate collagen in a manner that will provide nanoscale control of collagen fibril interaction by the thiolation of collagen monomers and fibrils. The first step is to develop a technique for collagen fibril assembly and surface adsorption to a desired surface. Surface characterization data by surface plasmon resonance refractometry and atomic force microscopy are presented.

PARALLEL CRYSTAL GROWTH SIMULATION

Curtis Barrett and Brian Raymes (Department of Computer Science) Amit Jain

Material engineers are interested in developing advanced models that allow realistic, three dimensional microstructures to be studied. For example, these models are used to study the susceptibility of a material to crack under certain conditions. The models are implemented as simulations on a computer. These simulations require massive amount of computing and can

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take months on a single computer. In order to make the simulations feasible we have developed a parallel version of the software. The parallel version of the software has sped up the modeling work by a factor of hundred. It was developed and runs on the Boise State Beowulf Cluster, which has 122 processors. As part of the research, we are also developing a graphical visualization to make it easier to analyze the data.

IMPACT FORCES ON THE LEGS FROM PITCHING

Jeremy Bergh (Department of Mechanical Engineering) *Michelle B. Sabick*



Many major league pitchers have had knee problems later on in their life. This study will investigate the impact forces generated during the pitching stride. A young male in his mid 20's will throw ten pitches in each of two conditions. Ten pitches will be performed with the back, or drive leg, on the force platform, and ten pitches will be performed such that the stride leg lands on the force platform. The mean peak ground reaction forces for each leg will be compared to determine how much force is generated during the pitch, and the amount of stress that can be put on the knees and joints.

CHARACTERIZATION OF NEGATIVE DIFFERENTIAL RESISTANCE IN CHALCOGENIDE DEVICES CONTAINING SILVER.

Armand Bregaj (Department of Electrical and Computer Engineering) *Kristy Campbell*

Chalcogenide materials are compounds that contain one of the group VI elements such as sulfur (S), selenium (Se), and tellurium (Te). These materials are presently under research in industry and academia for their potential use in electronic memory devices. An electrical property called negative differential resistance (NDR) has been observed in chalcogenide devices containing silver (Ag). NDR describes the I-V characteristics of the device where the voltage and current are inversely related. Some of the devices that operate in the NDR region are the tunnel diode, resonant tunnel diode, uni-junction transistor, and Gunn diode. The research work to be completed this semester includes measuring the I-V characteristics of chalcogenide devices exhibiting the NDR property. The electrical data obtained will be compared with existing device models to determine a potential mechanism responsible for the observed NDR in silver-containing chalcogenide devices.

INVESTIGATION OF PLASMA INDUCED DAMAGE IN THROUGH WAFER INTERCONNECTS

Pedro Cahuana and Ricardo Ayllon (Department of Electrical Engineering/Materials Science and Engineering) *William Knowlton*

BSU in conjunction with Research Triangle Institute has developed through wafer interconnects (TWIs) which are used for 3D stacking of electronic devices. However, the TWI manufacturing process may cause plasma induced damage (PID) in the dielectric material of metal oxide semiconductor (MOS) devices. Therefore, electrical device characterization techniques to investigate PID have been designed and implemented using various sized MOS devices. The results indicate that major damage is not observed when comparing the electrical behavior of the MOS device before and after processing.

MAGNETIC SHAPE MEMORY ALLOYS AT BOISE STATE UNIVERSITY

Dave Carpenter, Michael Hagler, Markus Chmielus, Kimo Wilson, Nathan Kearns, and Peter Müllner (Departments of Materials Science and Engineering and Mechanical Engineering) *Darryl Butt*

Since the development of the first shape memory alloy in 1961, the field has grown considerably as an increasing amount of applications have been found. This first alloy Nitinol, has been widely used from sealing hydraulic lines on aircraft to expanding arteries in the human body. This particular alloy can be deformed, and as heat is applied, return to its former

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shape. Even though its response time is fairly slow, it will always have applications where thermal sources are used as an activator. As technology improved, and higher response times were needed, new alloys were developed activated not by heat, but by a magnetic field. These ferromagnetic shape memory alloys have a much faster response rate and as such have applications as micro-pumps, valves, switches, and power generation devices. At Boise State University, research is currently being conducted on Ni-Mn-Ga to investigate time-dependent properties including magneto-mechanical fatigue, and also the influence of thermo-magneto-mechanical treatments on these properties.

NANO-MAGNETO-MECHANICS OF NI-MN-GA HEUSLER ALLOYS

Zak R. Clark (Department of Materials Science and Engineering) William Knowlton

Ni-Mn-Ga martensitic Heusler alloys deform by the motion of twin boundaries. Due to magnetic anisotropy, deformation-induced rearrangement of twin domains results in a deformation-induced change of magnetization. Scanning probe microscope nanoindentation is used to cause local deformation on Ni-Mn-Ga single crystal surfaces with {100} orientation. AFM and MFM are used to characterize the degree of deformation and variations in the magnetic microstructure due to nanoindentation.

PET DOOR CONTROLLED WITH RADIO FREQUENCY IDENTIFICATION

Christopher Curtis, David Anderson, and Aaron Moser (Department of Electrical Engineering) Scott Smith

A major consumer complaint about existing commercially available pet doors is the inherent lack of selectivity and security. The door indiscriminately allows stray animals and wildlife access to the interior of the consumer home. Our project endeavors to correct this problem and make a pet door that is more secure and that offers timed access control. Radio Frequency Identification will allow true un-duplicable keys to be used, and in combination with a timer, allow comprehensive pet control. It would also vastly improve security. Our entire project will encompass the integration of an RFID reader, a design-build antenna, a custom programmed microcontroller, and a stepper motor with motor drive circuitry, all built into a pet door with full functionality to determine the concept's feasibility and marketability.

CHARACTERIZATION AND DESIGN OF A FLOW CONTROL SYSTEM FOR A SUBSURFACE ION MOBILITY SPECTROMETER

Brandon Duncan (Department of Civil Engineering) Molly Gribb

Environmental monitoring is critical because of the effects contamination can have on human health, water quality, and the environment. To monitor subsurface contamination, Boise State University is developing an environmental probe equipped with an Ion Mobility Spectrometer (IMS). A central part of the IMS probe is the flow control system, which regulates both the introduction of the sample into the IMS sensor, and the working gas for the IMS and sample extraction system. System specifications require each flow control component to function within specific parameters. Testing was done on each component under various conditions to determine their working ranges. Characterization of each component was also completed.

Results from this work will yield a functional flow control system that can be incorporated into the environmental probe.

CMOS IMAGER PIXEL DESIGN FOR SPACE APPLICATIONS

Mark Elgin, Matt Katula, Ryan Paulson, and Dede Russell (Department of Electrical Engineering) Stephen Parke

Our project consists of working with two existing pixel designs for a CMOS imager that will be used in space. The first pixel



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design consists of a standard three transistor model. The second model consists of seven transistors and incorporates correlated double sampling and the behavior and characteristics of this model will also be examined. The investigation of the behavior of these two designs will be carried out using WinSPICE and Silvaco simulation software. We will enhance the current models by comparing the two simulation software results to improve accuracy. In both the three and seven transistor models we are using double gated MOS transistors which allow for superior amplifier design and a higher quality pixel. A significant portion of the research directed toward efficiently connecting the second gate of each transistor. A unique feature of this pixel is vertical integration or the stacking of the diodes with through box interconnects between the CMOS and the photodiode.



PRELIMINARY INVESTIGATION OF A HIGH DIELECTRIC CONSTANT MATERIAL TO REPLACE SiO₂ IN METAL OXIDE SEMICONDUCTOR DEVICES TO IMPROVE MOSFET RELIABILITY

Mark Elgin, Pedro Cahuana, and Ricki Southwick (Department of Electrical Engineering) William Knowlton

The drive to increase the speed of integrated circuits (IC) has pushed the physical limits of materials used IC devices. The thin dielectric material, or gate oxide, used in metal oxide semiconductor field effect transistors (MOSFETs), SiO₂, has decreased to nearly 1 nm (~ 4 atomic layers). At this thickness, the gate oxide loses its bulk insulative properties. Electrons easily tunnel through the SiO₂ thereby increasing the leakage current. To maintain the speed and reduce the gate oxide leakage current, other higher dielectric constant (k) oxides such as HfO₂ are being investigated. HfO₂ on silicon is thermodynamically unstable resulting in a sub-1 nm SiO₂ interfacial layer. We investigate the question: during device lifetime, does the HfO₂ or interfacial layer degrade and fail? We implement accelerated testing and characterize MOSFET parameters relative to HfO₂ thickness. Computational methods are used to estimate voltages, electric fields and tunneling regimes for each oxide.

SILICON SOLAR CELLS USING BACKSIDE CONTACTS WITH THROUGH-WAFER INTERCONNECTS

Aaron Erbe (Department of Materials Science and Engineering) Amy Moll

In traditional solar cell designs light must pass through the n-type material with the cathode designed as a metal contact grid. This contact grid compromises useable surface area resulting in a shadow effect which lowers its efficiency.

The Backside Contact (BC) design is one method under development to increase the efficiency. The BC design attempts to place both the n and p-type contacts at the rear. Our design uses Through-Wafer Interconnect (TWI) technology to provide a conductive path from the n-type Silicon to the cathode at the rear. Some advantages of the BC-TWI design are increased surface area allowing more absorption of photons, eliminated "shadowing" effect, potential for higher density cells by removing the need for interconnecting Bus Bars.

DESIGN OF A VARIABLE FREQUENCY CONTROL SYSTEM FOR A MULTIPLE-PHASE FREE-PISTON STIRLING ENGINE SYSTEM

David Estrada (McNair Scholar) (Department of Electrical Engineering) Seth Sanders (UC Berkeley)

Initial investigation of low-cost distributed solar-thermal-electric power generation technology, based upon a solar thermal collector and a three-phase free-piston Stirling engine, revealed the need for individual control of phase delays between expansion and compression spaces in order to compensate for possible asymmetries of the system. Using the method of symmetrical

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components it can be shown that implementation of individual phase-delay control allows for correction of unbalanced operations and can be implemented in a closed-loop system letting the system monitor and adjust its performance. We investigate the design of a variable frequency control circuit for a multiple-phase DC-AC power inverter that provides independent adjustment capabilities for individual phases of a multiple-phase free-piston Stirling engine system. We note that incorporation of analog to digital converters in the user interface portion of this circuit would further increase compensation capabilities of the system asymmetries and allow for applications in a self-correcting closed-loop system.

PROPOSED NORTH WILDWOOD DEVELOPMENT

Blaise Exon, James Bailey, Brandon Logan, Christina Sorrels, and Don Tibbetts (Department of Civil Engineering) Stephen Affleck

This development plan is a response to a request for the design of eight fourplex units and the development of an existing 2.36 acre parcel of land near Fairview Ave, and North Wildwood St. Our group proposes to divide the land into eight fourplex lots. The project will include permitting and site layout, environmental, geotechnical, structural, and transportation. Necessary permits will be determined and any documentation needed will be provided on the poster presentation. The site will be laid out to conform to all applicable codes and regulations as well as meet design criteria set forth in the proposal request.

THE EFFECTS ON THE KNEE OF DIFFERENT TERRAINS

Rafael C. Garcilazo (Department of Mechanical Engineering) Michelle B. Sabick

The demands on the lower extremity are likely to change when athletes play on different surfaces. Since higher demands are likely to result in increased incidence of injury, for safety reasons it is important to quantify different loads for different surfaces. The purpose of this study is to compare the impact forces the lower extremity experiences while landing on harder surfaces compared to softer surfaces. The terrains that will be compared in this study are artificial turf, wood, and carpet. Surfaces will be compared by using force platforms to quantify ground reaction forces. The subject will hang from a bar above the terrain and fall approximately 15 inches to the ground and drop onto the force platform landing on both feet. This will be done five times on each of the three surfaces. The peak ground reaction force in each trial will be recorded and mean values computed for each surface to determine which causes the greatest loads on the lower extremity.



CIVIL ENGINEERING SENIOR DESIGN LAND DEVELOPMENT PROJECT

Daniel Gerichs, Rhonda Faulkner, Emmy Guthrie, Chris Roy, and Justin Sandquist (Department of Civil Engineering) Stephen Affleck

This Land Development project is a component of the Civil Engineering Senior Design class. Local building codes will be used for placement and sizing of our site. In addition to these codes, information learned in various Civil Engineering courses will be applied to ensure public safety. Currently the site is an empty lot in western Boise. The site has various issues which will need to be overcome to allow for the development of this site. Our presentation will be a poster that shows the site and our recommendations for land development.

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PRELIMINARY STUDY OF NOR DIGITAL RESPONSE TO SINGLE PMOSFET DIELECTRIC DEGRADATION

Terry Gorseth, David Estrada, Josh Kiepert, and Patrick Price (Department of Electrical and Computer Engineering) William Knowlton

A preliminary study to investigate the effects of oxide degradation in a nanometer-scale transistor on digital logic was performed. Using a newly developed Switch Matrix Technique the single transistor is stressed by applying a -4 volt bias in 600s intervals. A substantial timing delay, attributed to the transistor oxide degradation, is observed when the stressed device is placed in the NOR logic gate configuration. This considerable digression from normal operations could potentially cause logic errors in a high speed digital circuit when introduced into a large scale design.

ALTERNATIVE TEST METHOD FOR INTERLAMINAR FRACTURE TOUGHNESS OF COMPOSITES

Joshua Gunderson (Department of Mechanical Engineering) Anthony Paris



Two methods of determining the mode I interlaminar fracture toughness for fiber-reinforced polymer matrix composites are compared. Both methods of testing are carried out simultaneously on a double cantilever beam (DCB) specimen. The standard method of determining GIC is based in linear-elastic fracture mechanics theory and requires a visual measurement of the crack length, presenting data acquisition and analysis difficulties, as well as the load and displacement of the loading points. The proposed method makes use of elastic-plastic fracture mechanics theory and the J-integral to relate the fracture toughness JIC, load, and rotation at the load application points. The load and rotation are

acquired using a data acquisition system. This method has the advantage of replacing graphical information with discreet digital information, as well as being applicable to a broader class of materials. Test results are compared to determine if the proposed method is a suitable alternative to the standard method.

USE OF FERROMAGNETIC SHAPE MEMORY ALLOYS FOR POWER GENERATION

Michael Hagler, David Carpenter, Markus Chmielus, Kimo Wilson, and Nathan Kearns (Departments of Materials Science and Engineering and Mechanical Engineering) Darryl Butt, Peter Mullner

Ferromagnetic shape-memory alloys with twinned martensite tend to deform upon the application of a magnetic field. A strain induced change in the magnetization of a NiMnGa alloy can be reversed with the application of a magnetic field. When exposed to a constant magnetic field, a deformation results in a change of magnetization. This changes the magnetic flux density, which induces a voltage in a pickup coil. If the strain and the magnetic field are perpendicular, magneto-mechanical deformations are repeatable, allowing power generation. This concept is currently being tested experimentally with a mechanical strain device, within a static magnetic field.

ENERGY CONSERVATION BY VOLTAGE REGULATION

Mirsad Hajro, Dejah Delic, Scott Hillis, and Luke Peters (Department of Electrical Engineering) Said Ahmed-Zaid

One of the largest expenses for a utility company is purchasing electricity from other power utilities during times when customers use more than the company can produce. Reducing the energy consumed during this period will save potential millions for the company. We will study the effects of reducing household voltages to decrease energy demand. Using Matlab, a data acquisition card, and a variable voltage source, we will analyze the effects of how

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household devices respond to various applied voltages. Data will be collected for three voltage levels (114, 120, and 126V). This data will be used to calculate the power consumed by each device at each voltage. The power consumed by all devices will be combined in the form of a mathematical model for a typical household. Finally, we will produce an overall response of the house model which will tell whether or not energy will be saved by lowering the voltage.

WIRELESS LIGHT SWITCH

Tyler Hansen, Mark Hadrick, and Patrick Nagler (Department of Electrical Engineering) Nader Rafla
Changing the location of light switches in a home, or converting a two way switch into a three way switch involves not only electrical work, but also carpentry and considerable time and expense. The objective of this project is to provide an alternative design methodology that can be used to convert a standard light switch into a two way switch controlling an existing light fixture. The design requirements include: an operating range of not less than 60ft, a means of uniquely identifying the signal such that several units may be employed in the same household, and an aesthetically pleasing design that is easily identified as a light switch. The system under development uses low power RF signal transmission and reception. The transmitter is powered by battery and transmits an 8 bit digital code on the 315 MHz frequency while the receiver, at the base, is powered by standard AC 60Hz 120V.

DETERMINING NANOMECHANICAL PROPERTIES OF BIOMATERIALS VIA ATOMIC FORCE MICROSCOPY

Zachary Heuman, Zak Clark, and David Araujo (Department of Materials Science and Engineering) William Knowlton

Only recently has Atomic Force Microscopy (AFM) been used to study the mechanical properties of biomaterials. The AFM's ability to image and manipulate the surface of a sample makes it ideal for such experiments. Two AFM methods are being developed in this study to examine the structural role that collagen fibrils play in cartilage. These methods are called Force Spectroscopy and Negative Lift Mode. Force Spectroscopy is a single molecule pulling technique that is used to extract parameters such as flexibility and molecule length. Negative Lift Mode is an imaging technique that measures differences in indentation depth into a material. The observed differences as a function of depth can then be used as a qualitative measure of hardness. These two methods of gathering mechanical data on collagen will aid in further understanding degenerative diseases such as osteoarthritis and how to produce artificial cartilage.



CITY OF CHARLIE RESERVOIR PROJECT

Thomas Holman, Tj Bird, Dave Gundy, Megan Malloy, Harry Nelson, Travis Soppe, and Aaron Trimm (Department of Civil Engineering) Stephen Affleck

In this design project, the design of a water reservoir, booster pump station, and water distribution system will be reviewed. The project is an actual public works project ongoing in the Boise Valley. The design will incorporate different aspects of civil engineering such as structural, environmental, transportation, and geotechnical design. This poster will include a project overview comprised of a background, proposed plan of action, and site layout.

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ACOUSTIC CHARACTERIZATION OF STETHOSCOPES

Casey Huffaker, Ben Chadez, and Brad Kinney (Department of Mechanical Engineering) Joe Guarino

The purpose of this project is to compare stethoscopes of various geometries and materials. We have custom built several models that have been compared using a frequency generator. The custom built models have also been compared to traditional stethoscopes like those found in doctor's offices. We have discovered that the geometry and material of a stethoscope play a great roll in its ability to acquire sound. Eventually we are going to use the stethoscopes on patients with damaged shoulders. First we place the stethoscope on a patient and a physician assists them with several exercises. The sounds are routed through an acoustic filter and then to a computer with sound processing software. This method has the potential to diagnose shoulder injuries in an inexpensive, non-surgical way. To be successful, the stethoscope must capture the entire range of frequencies that might be emitted by a shoulder joint.

ADVANCED FABRICATION TECHNIQUES FOR AN ION MOBILITY SPECTROMETER IN LOW TEMPERATURE CO-FIRED CERAMICS

Brian Jaques (Department of Materials Science and Engineering) Amy Moll

This project is focused on the development of a miniature Ion Mobility Spectrometer (IMS) fabricated with Low Temperature Co-Fired Ceramics (LTCC). The current design of the IMS drift tube incorporates 384 printed layers, consisting of two individual post-bonded segments, to create a constant electric field. This results in a drift tube with approximately 128 conductive rings per inch. New fabrication techniques were developed to incorporate the 75mm long drift tube with a 40mm outside diameter and a 20mm inside diameter. These techniques include constrained lamination, precision milling, extended furnace firing profiles, and an advanced post-fire bonding technique. Our work includes a successful prototype device of 156 layers of printed circuitry and five embedded metal gates as well as a 192 layer device with printed circuitry without gates. We have also been able to bond two post-fired 192 layer drift tubes together with a glass encapsulate paste provided by Dupont®.

DIFFERENCES IN BONE VOLUME OF THE CRANIUM OF MICE WITH AND WITHOUT DWARFISM WITH A GESTATION PERIOD OF 17.5 DAYS

Jackie Keilty (Department of Mechanical Engineering) Michelle B. Sabick

Dwarfism is a genetic deformity that affects the size of bones within a body. The purpose of this study is to compare the volume of the different bones that make up the cranium of mice with dwarfism to those without dwarfism. A micro CT scan was taken of two mice from the same litter with a gestation period of 17.5 days. The data will be entered into the Mimics software package with identical parameters and each bone will be isolated and imported into the Magics software package to quantify the volume of each bone. An analysis of each bone volume in the mouse with dwarfism will be conducted and compared to the analysis of the mouse without dwarfism to see how dwarfism affects the cranial volume.

EFFECTS OF FATIGUE ON THE CENTER OF PRESSURE WHEN LANDING FROM A JUMP

Jackie Keilty (Department of Mechanical Engineering) Michelle B. Sabick

Fatigue in the lower extremities is likely to affect balance during landing from a jump, which can lead to injury. The purpose of this study is to compare the path of the center of pressure in adults, an indicator of balance, before and after fatigue is induced in the lower extremities. Three adults with an athletic background will jump off of a 12" box five times onto two force plates that will record the location of the center of pressure as a function of time. Subjects will jump to their maximum vertical height and continue jumping until only 50% of their maximum height can be reached. The center of pressure will then be measured again. A mean value of pre-fatigue and post-fatigue data for the five trial from each adult will be compared. A statistical analysis will be conducted to determine how fatigue affects the center of pressure.

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EFFECTS OF THROWING ARM POSITION ON THE ELBOW HUMEROULNAR JOINT

Eric Ketelhut (Department of Mechanical Engineering) Michelle B. Sabick



In the past few decades there has been an increasing rate of young baseball players that have elbow trouble, leading to “Tommy John” surgery. The purpose of this study is to compare the different forces and torques on the elbow from three throwing positions to determine which position is most detrimental to the athlete’s elbow. One undergraduate student will perform these three throwing position motions five times each with a baseball. The three positions will be, with the elbow flexed nearly 90 degrees, the next will be with the elbow flexed about 45 degrees, and the final position with the elbow flexed nearly 120 degrees. The peak values for the torque will be calculated for each of the different arm slots. This data will be compared to determine

which throwing position is most likely to cause injury to the elbow.

SCIENTIFIC DATA VISUALIZATION USING OPENDX

David Knight (Department of Electrical Engineering) Wan Kuang

Visualizing and manipulating large three dimensional data sets created by programs that simulate photonic crystal devices is the subject of this work. Visualization is the process of manipulating data and using it to create images. These images allow people to gain meaningful insights into the meaning of the data. A visualization program written using OpenDX, a powerful program which can be used to write visualization programs, is presented. Some images rendered using this visualization program are also presented.

WILD RANCH ESTATES DEVELOPMENT

Joseph Lane, Robert Anderson, Stacy Gates, Jon Knopp, and Brett McDermott (Department of Civil Engineering) Stephen Affleck

The focus of this project will be to design a residential subdivision consisting of eight fourplexes on a 2.36 acre property. The project will consist of the following designs: structural, roadway, geotechnical, and water systems. Structural design will include the design of a timber frame structure that will meet all building codes. Structures will be designed so that they will be handicap accessible. Other things to be addressed will be road access off of North Wildwood Street, minimum setback from property lines, and architectural landscape of the property. Public safety requirements will be incorporated in to the design.

UTILIZATION OF PLASMA ETCH TO PRODUCE THROUGH WAFER INTERCONNECTS

Mitch Lecertua (Department of Materials Science and Engineering) Amy Moll

This research involves the characterization of a DRIE Bosch plasma etch process in order to develop high aspect-ratio vias on active device silicon wafers. The goal of this research is to plate the inside of the vias with copper, and apply an electrical current from the backside of the wafer to test the devices’ conductivity. If this proves to be a viable process, this technology could allow the miniaturization of components within many of our everyday devices such as cell phones, PDA’s, and laptops. The through wafer interconnects would make it possible to stack active device wafers on top of one another in a three dimensional manner, as opposed to today’s method of arranging the devices side by side in a two dimensional manner. Benefits include faster device operation, improved battery life, and significant improvements in miniaturization.

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DC MOTORIZED CART

Michael Lindley, Shane Cavanaugh, Valentin Draghichi, Hussein Khoj, Ramish Kriezenbeck, and Abhiraam Mocherla (Department of Electrical Engineering) Said Ahmed-Zaid

Physically challenged consumers require assistance while shopping at many retail stores. This assistance is currently being provided by electric motorized carts which in many cases have been proven to be unreliable. We have researched carts used by local retail stores to determine the most popular type and to find the root causes of the reliability issues. Through reverse engineering we will attempt to narrow our focus to the major issues that are resulting in the breakdown of the carts. We started with all the parts necessary to build a complete motorized cart. To isolate the reliability issue we ran a series of tests on each part individually and also integrated tests with multiple parts. At this time we are focusing on the motor and the type of battery. Once the problem is found we will be able to focus on improvements.

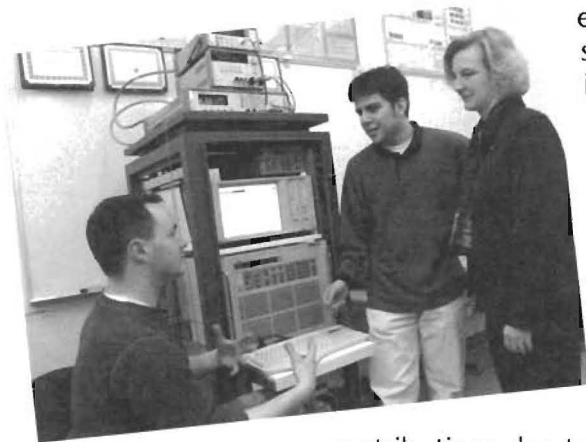
LIGHT EMITTING DIODE LAMP

Joseph Lindsey and Russel Riggs (Department of Electrical Engineering) Kristi Campbell

With ever-rising energy costs individuals, municipalities and corporations are seeking ways to conserve power and improve the bottom line. LED technology exhibits excellent efficiency and longevity. This savings makes LED lighting an excellent choice for overall energy and cost savings. In the best case, diode lamp lighting elements consume 92% less energy than conventional incandescent lighting elements and can perform for more than 20 years. The human eye has cones that are only sensitive to the three primary colors. To produce all colors in the light spectrum we must excite the certain cones in the eye by missing wavelengths of light associated with these colors. The fabrication of white light necessitates the combination of all three primary colors. In this project, we utilized these properties to fabricate a LED lamp that produces white light in a much more efficient manner than its incandescent counterparts.

ELECTROCHEMICAL SENSOR FOR MONITORING ENGINE OIL QUALITY

Matthew T Luke and Gordon Belfour (Department of Materials Science and Engineering) Darryl Butt, Brian Marx



As engine oil degrades or becomes contaminated the electrical response of the oil changes. An electrochemical sensor has been constructed for detecting these changes in oil/metal systems. The sensor is used to make Electrochemical Impedance Spectroscopy (EIS) measurements and the impedance responses are compared. The responses are measured as a function of oil additive depletion, oil degradation or contamination. This work also compares the impedance data for various steel/oil systems to gather information on metal engine part corrosion. A basic Randle's circuit was used to fit the impedance data and the interfacial resistances and capacitances are compared. This type of fit provides information pertaining to properties of the bulk oil and contributions due to the interactions at the oil/metal interface.

(ASCENT) WIRELESS SENSOR NETWORK FOR AIRLINER CABIN

Mike R. Martin, Mike Logue, Sin Ming Loo, Arlen Planting, and Jingxia Wang (Department of Computer Science) Sin Ming Loo

The Air Transportation Center of Excellence for Airliner Cabin Environment Research (ACER) at Boise State University has been tasked by Federal Aviation Administration (FAA) to research, develop, and prototype a wireless sensor backbone for commercial airliner cabins. A vital

component of this task is to create a wireless sensor network for monitoring cabin environment in airplanes. This poster describes this wireless network named, Airline Sensor and Cabin Environment NeTwork (ASCENT). A demonstration of current network configuration along with the latest prototypes will be provided during our presentation.

RECONFIGURABLE HARDWARE-BASED WIRELESS SENSOR NETWORK BACKBONE SYSTEM FOR AIRLINER CABIN RESEARCH

Matthew R. Murdock, Mike Martin, Arlen Planting, and Jingxia Wang (Department of Electrical and Computer Engineering) Sin Ming Loo

The Air Transportation Center of Excellence for Airliner Cabin Environment Research (ACER) at Boise State University has been tasked by Federal Aviation Administration (FAA) to research, develop, and prototype a wireless sensor backbone for commercial airliner cabin. A vital component of this task is to create a sensor backbone system where large numbers of sensors can be interfaced. A reconfigurable hardware-based sensor backbone has been designed and prototyped. This poster shows our design and the part it plays in the overall wireless sensor network. Much has been learned through this first prototype. The posters also describe lessons learned for upcoming design.

PERCOLATION BEHAVIOR OF SIMULATED IRREGULAR GRAIN BOUNDARY NETWORKS

Brett Nelson (Department of Computer Science) Megan Frary

The corrosion and cracking behavior of materials are determined by how grain boundaries susceptible to attack are connected with each other. The percolation threshold is the fraction of susceptible boundaries above which a connected path exists across the microstructure; therefore, determining the percolation threshold is important for microstructural design. The threshold is known for hexagonal lattices, but these lattices are unrepresentative of real microstructures. Therefore, an algorithm to simulate irregular microstructures was developed in which a varying fraction of grain boundaries in an initially hexagonal lattice are realigned to simulate more realistic 2D microstructures (i.e., more irregular grain shapes). The grain boundaries are classified based on their relative grain misorientations and the microstructure analyzed to determine if percolation exists. The algorithm is being optimized for compiled C and will be implemented in parallel on a super-computing cluster. As a result, the effects of lattice irregularity on the percolation threshold will be understood.

EFFECTS OF BENCH INCLINATION ON THE PECTORAL MUSCLE GROUP

Peter Ottoson (Department of Mechanical Engineering) Michelle B. Sabick

When doing a bench press exercise, weight lifters will often change the inclination of a bench to work different parts of the pectoral muscle group. The purpose of this study is to determine which part of the pectoral muscle group is worked in the different bench inclinations. Electromyographic electrodes will be attached to the top, middle, and bottom of the pectoral muscle group of the test subject and he will perform a slow set of five repetitions in three bench configurations: inclined, declined, and flat. A three second oral count will be used to control the speed during each repetition, thus ensuring similar joint angles in each trial. The muscle activation during the three exercises, measured by the electrodes, will be collected. The data will then be reviewed to see if there is any difference in which part of the pectoral muscle group is worked in the different bench inclinations.

WIRELESS COMMUNICATION USING FPGAs

Mark Owen and Jose Garcia (Department of Electrical Engineering), Said Ahmed-Zaid

Field programmable gate arrays (FPGAs) are a rapidly growing industry application. They use programmable hardware which allows the functionality of the chip to be easily changed with very little development time. The goal of this project is to develop a wireless network of

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sensors communicating directly with a central unit using FPGAs. The work on this project is broken up into sections, based on function. These stages of work include radio work, sensor work, and data storage work. As portions of the work are finished, they get integrated into the whole for testing. As work is done in this fashion, the project will progress to the final prototype. The finished prototype should be able to receive data from all sensor units at least once per minute and at a range of up to thirty meters. The data collected will be displayed by the central unit.

OPTIMAL BODY POSITIONING ON A TIME TRIAL BIKE

Steven W. Parker (Department of Mechanical Engineering) Michelle B. Sabick

Time training is a specific discipline of bicycle racing where each competitor rides a predetermined course individually to race for the fastest time. In these races the two greatest limiting factors are power output and aerodynamic drag. The purpose of this study is to find the optimal pedaling position for maximum power output and minimum aerodynamic drag. Drag is typically reduced by laying the body low and out of the wind; however when the body reaches too low of a position, power output is greatly reduced. For this experiment, a rider's power output will be measured in various body positions and compared against the frontal area of the rider to represent aerodynamic drag. Power will be measured using an on board power meter that can transfer its data to a computer for analysis. Frontal area will be calculated using a head-on digital photo of the rider and photo editing software.

EFFECT OF ANKLE BRACES ON STABILIZING LANDING

Teri Penza (Department of Mechanical Engineering) Michelle B. Sabick

A common injury that is often overlooked is sprained ankles. Braces are proved to aid the stability of injured ankles. The purpose of this study is to compare the velocity of the center of pressure, a measure of dynamic balance, in braced and un-braced ankles. One undergraduate student, with repeated ankle sprain incidents, will jump barefoot five times, each in braced and un-braced conditions, from a 12" box and land on the injured ankles associated leg. The landing will occur on a set of force plates that will track the vertical ground reaction force. The mean velocity of the center of pressure for each case, brace and un-braced, can then be compared to see if braces aid in protecting and stabilizing an injured ankle.

EFFECTS OF LANDING STRATEGIES ON NON-CONTACT ANTERIOR CRUCIATE LIGAMENT (ACL) TEARS

Teri Penza (Department of Mechanical Engineering) Michelle B. Sabick

Non-contact ACL injuries occur more frequently in adult females than in males. The purpose of this study is to determine if landing strategies differ between pre-pubescent females and males, and if so do the differences might promote ACL injuries. Five pre-pubescent females and males will drop from a normalized height, land on one leg on a force platform, and run to the right, center or left. They will be given a visual cue while in flight for which direction to run. Each subject will have a total of nine trials; three for each run direction. The run directions will be presented in random order. The vertical ground reaction force and lower extremity joint kinematics will be determined in each trial. The mean of the reactions at the knee will be compared between the males and females to see if the landing strategies between these two groups promote ACL injuries.

EFFECTS OF WEIGHT LOADING ON DIFFERENT STYLES OF BACKPACKS

Brett Quinney (Department of Mechanical Engineering) Michelle B. Sabick

Hikers, students, and especially military personnel are faced regularly with heavy loading in backpacks. Many injuries complained about are lower back, ankle, and knee damage. The purpose of this study is to compare three different kinds of backpacks and their unique designs including: hiking pack, book bag, and a military pack. A volunteer will take a load of 35 pounds in each pack to test the center of pressure to see how the pack affects a person's

posture. Another test will be a timed five minute jog on a treadmill with the same amount of weight and will involve a rating to see how comfortable each pack is under intense activities. The results of these experiments will be compared statistically to see which kind of pack has the best performance in design and ability of packing with minimal harm to body.

ON THE USE OF XML FOR AIRLINER WIRELESS SENSOR NETWORK DATA MANAGEMENT

Dereck D. Rasmussen, Sin Ming Loo, and Arlen Planting (Department of Computer Science) Sin Ming Loo

The Air Transportation Center of Excellence for Airliner Cabin Environment Research (ACER) at Boise State University has been tasked by the Federal Aviation Administration to create a wireless sensor backbone for commercial airliner cabins. A vital component of this task is data management. The challenge is determining how to handle a large volume of collected data in order to allow processing, transfer and storage by a wide variety of means. The data management solution needs to be flexible to adjust to potential changes, and robust to allow data conversion and manipulation using other mediums such as browsers and databases. eXtensible Markup Language (XML) has these capabilities. This paper discusses the use of XML data management for the ACER project.

THIN FILM TRANSISTOR RESEARCH

Rushi Rathod and Armand Bregaj (Department of Electrical Engineering) Said Ahmed-Zaid

This paper demonstrates the fabrication techniques of transparent thin film transistor (TFT)



with ZnO as the active channel layer. The deposition of the thin films by magnetron sputtering at room temperature is illustrated. The incentive behind such a research project comes from the need for transparent, reduced budget, high current drive circuits used in significant display applications. A few of the Flat-Panel Display (FPD) areas include, organic light emitting diode display (OLED), field emission display (FED) and touch panel displays. The magnitude of the project lies on the potential improvement of electron channel mobility leading to higher drive currents and faster operating speeds due to the ZnO channel layer. Out tasks for this project are: to design a process flow considering the

limitations connected with lab equipment, fabricate the transistors, and test the electrical properties. Our end of semester goal is to have an electrically functional transistor that is transparent to visible light.

ENERGY SCAVENGING DEVICE IN LOW TEMPERATURE CO-FIRED CERAMICS

Sarah J. Scherrer (Department of Materials Science and Engineering) Amy Moll

One form of energy scavenging is the conversion of mechanical vibrations to electrical energy. This energy provides a method to power remote devices without batteries or wires. A practical scavenging device must be compact yet produce an output power large enough to be usable. An Energy Scavenging Device (ESD) has been designed in Low Temperature Co-fired Ceramics (LTCC) to harness vertical vibrations and transform them into power. Environmental vibrations move a conductive coil fabricated in ceramic cylinder through a magnetic field. The coil rests between two springs. The ESD is 90 layers thick with five coils on each layer giving the system 450 densely packed coils. The target application for this device is an airplane wing during flight. A vibrating table with pure sinusoidal motion in the vertical direction has been built for testing prototypes. The device performance was determined by measuring power output as a function of the oscillation frequency.

ELECTROMECHANICAL CALCULATOR

Charles Scott, John Clay, Chris Hale, and Jim Steele (Department of Electrical Engineering) Elisa Barney Smith

Our senior design team is designing an application for a XYZ-table for the Discovery Center of Idaho. The application will consist of a calculator with a mechanical output. The calculator input will come from a graphical user interface (GUI) on a PC. The GUI will be created using National Instruments LabView. The program will then control the XYZ-table, which will use optical character recognition to locate numbered blocks on the table, pick them up, and position them to create the correct answer. We are also planning to create a web interface that would allow the unit to be controlled remotely for demonstration purposes. Because the application is the primary design, it will not be necessary for us to design a XYZ-table. We will be integrating the vision, motion control, and web components on an existing table to control the application.

FLUOROSCOPIC ANALYSIS OF KNEE JOINT KINEMATICS

Charles Scott (Department of Electrical Engineering) Elisa Barney Smith

Knowledge of the three dimensional positions of bones at a joint as a function of time is required to accurately model joint kinematics. 3-D bone geometry data from a static computer tomography (CT) images can be combined with time sequence information from 2-D video fluoroscopy images to produce 3-D position data over time. The process involves creating virtual X-rays from the CT image through digitally reconstructed radiograph (DRR) projections. Historically, the process of matching the 3-D and 2-D data has required human interaction. We have eliminated the need for manual initialization using a Monte Carlo technique with a variable search range. The search range decreases as the matching improves, avoiding the inherent problems of local minima in the optimization search. Experiments demonstrate that image positions can be matched to within 1 degree rotation, azimuth and elevation in most cases without human intervention.

A COMPARISON OF TWO TYPES OF BICYCLE PEDALS

Paul Shepard (Department of Mechanical Engineering) Michelle B. Sabick

Bicyclists can use either platform pedals where the shoe moves freely on the pedal, or clip-ons where the hard sole of the shoe is attached to the pedal. My study will compare the muscle groups used with each type and determine which pedal contributes to a more efficient motion. I will ride a bicycle in a stationary frame for a warm-up period of ten minutes, then conduct a test lasting ten minutes using clip-on pedals while eEMG sensors record the activity of my hip and knee flexor muscles. The pedals will then be switched to platforms and the test repeated. The work of the muscle groups will be compared for each pedal type and since the rectus femoris and hamstring groups are not normally associated with the pedaling motion, a difference in results would indicate that one pedal type is more efficient.

PERTURBATION RESPONSE AND BALANCE CONCERNING MILD CEREBRAL PALSY

Dustin Shively (Department of Mechanical Engineering) Michelle B. Sabick

Cerebral Palsy (CP) affects millions of people worldwide and often results in balance and motor difficulties. Due to the varying nature of the disability, understanding its intricacies would better provide treatment for each individual patient. In this study, by use of an Anterior-Posterior (A-P) translating perturbation platform, the balance of a subject with CP will be analyzed and compared to another subject without CP. Both subjects will undergo identical trials in which they will be standing on the perturbation platform and must respond to its random movements. Electromyographic (EMG) data of ankle plantarflexors and dorsiflexors as well as

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kinematic motion-capture data will provide the quantitative comparisons between muscle latencies and joint movement, relative to the perturbation. A static center of pressure (COP) analysis will also be taken. It is hoped that from determining which muscles fire and when, that measures can be taken to improve treatment where needed.

PRINTER MODELING

Jim Steele (Department of Electrical and Computer Engineering) Elisa Barney Smith

The goal of our research is to develop and calibrate a model for the distribution of toner particles in laser printers. Information from a working model could then be used to improve the Optical Character Recognition (OCR) process when scanning documents. An initial model has been developed and the research is in the testing and calibration phase. To test the accuracy and calibrate it, hundreds of microscopic pictures are used to compare whether small pixel patterns match what is expected from the model that we have developed.

PEAK FORCE ON KNEE DURING CLEANS

Tyler Thayn (Department of Mechanical Engineering) Michelle B. Sabick

Many athletes experience pain in their knee joints. The purpose of this experiment is to determine the peak force experienced by the knee during cleaning (a type of weight training) and determine its effect on knee cartilage. One undergraduate student will repeatedly clean a weight on a force platform that will measure the ground reaction forces. The cleaning motion will be repeated five times for each of three different weights: 130 pounds, 150 pounds, and 170 pounds. The peak knee joint compressive force will be calculated for each trial. These values will be averaged and the mean for each weight will be used to determine the effect that cleaning has on cartilage in the knee.

RESEARCH AND PROTOTYPE OF BRUSHLESS DC MOTOR USING ZILOG MICROCONTROLLER

Nomer Tuazon, Joshua Gugelman, and Jeremy Miller (Department of Electrical Engineering) Sin Ming Loo

Brushless direct current motors are used in all aspects of our daily lives. As part of our senior design project, we are researching, developing, and prototyping a three phase brushless motor electronic control using a Zilog microcontroller. This poster will describe our design and the corresponding constraints including power consumption, space limitations, and per unit cost.

VALIDATION OF A PEDOTRANSFER FUNCTION FOR COARSE-GRAINED SOILS TO ESTIMATE HYDRAULIC PROPERTIES

Kristi M. Unholz (Department of Civil Engineering) Molly Gribb

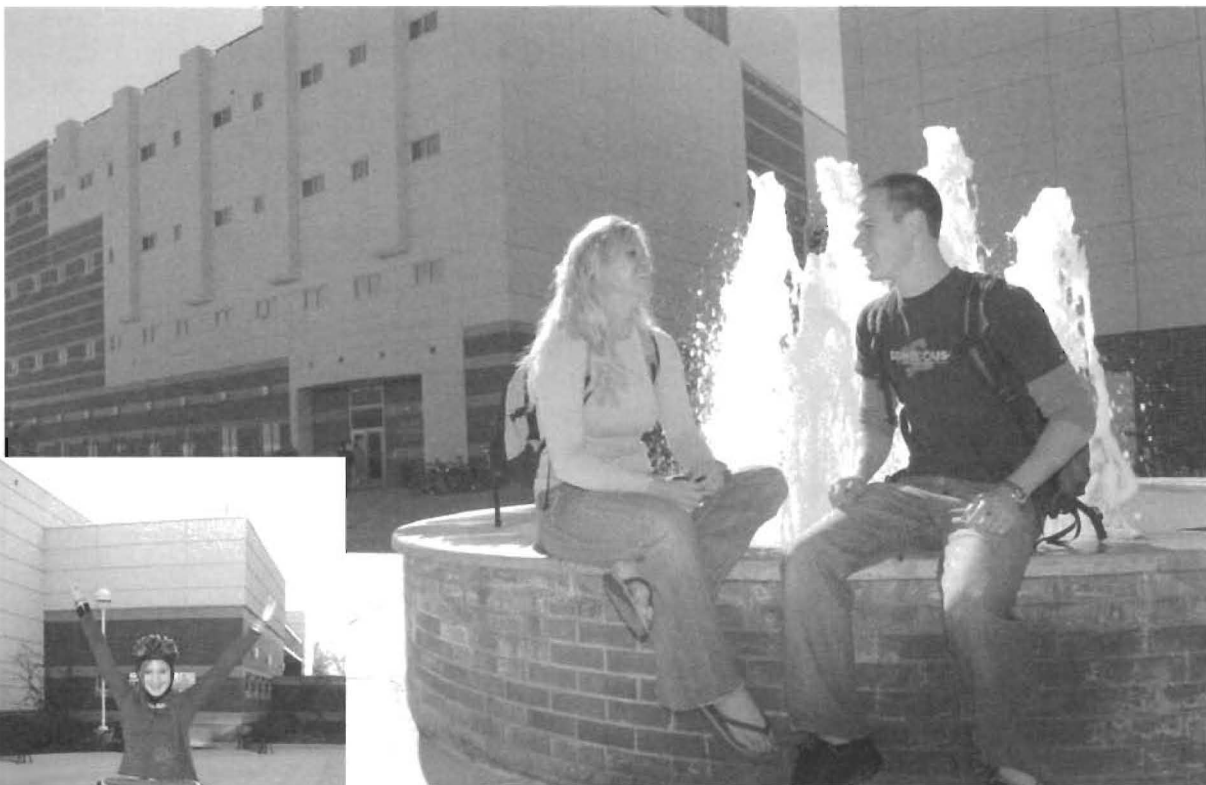
Hydraulic properties of soils are important for predicting water flow in the vadose zone and determining soil-water retention curves. These types of curves can be determined using laboratory procedures, in-situ measurements, or predicted using pedotransfer functions (PTFs). PTF's estimate soil hydraulic properties based on physical properties such as particle size distributions and bulk density. Previous comparisons of field measurements and PTF predictions have resulted in large discrepancies when the particle size distributions of the soils fall outside the PTF's calibration range. However, PTF's are often preferred over laboratory and field methods as they are less complicated and require less time. A specific PTF developed for coarse-grained soils will be used to estimate the soil-water retention of soils in the Dry Creek Watershed. Estimated soil-water retention curves will be compared to in-situ and laboratory measurements to determine the applicability of this PTF for these soils.

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EFFECT OF BIKE SUSPENSION ON SEAT ACCELERATION AND TIRE IMPACT FORCE

Brian Welshimer (Department of Mechanical Engineering) *Michelle B. Sabick*

Impact forces and rapid accelerations of a mountain bike seat can cause both rider discomfort and possibly a lack of control of the bicycle. The purpose of this study is to compare the forces and accelerations acting on a bicycle rider when riding two different bicycle types. The two designs to be tested are a downhill racing bike and a freeride bike. The downhill bike has approximately eight inches of suspension travel whereas the freeride bike has about five. The two bikes will be dropped from varying heights onto a force platform that measures the ground reaction force. Also an accelerometer will be mounted on the seat of each bike to measure what the accelerations would be on the rider. The results will then be compared to see which bike is better at reducing the forces and accelerations transferred to the rider.



COLLEGE OF HEALTH SCIENCES

EVALUATION OF DELIVERED VOLUME DURING VOLUME-TARGETED ASSIST-CONTROL ON THE PULMONETICS LTV 1000 AND NEWPORT HT 50

Ty Barnett (Department of Respiratory Care) Lonny Ashworth

During volume-targeted assist-control, the tidal volume (VT) should remain constant. At a set VT of 800 mL, the delivered volume should remain at 800 mL. The delivered volume was evaluated on the Newport HT 50 and Pulmonetics LTV 1000. Each ventilator was connected to the Hans Rudolph Breathing Simulator (HR 1101). HR 1101 settings: resistance (RAW) 5, 15, 25 cm H₂O/L/sec; compliance (CST) 20, 40, 60, 80 mL/cm H₂O. HT 50 and LTV 1000 settings: Rate 8/min; tidal volume 800 mL; PEEP 5 cm H₂O; TI 1.0 sec. Delivered volume was the average of a minimum of five breaths, while CST and RAW were changed. The ability of a ventilator to maintain the desired tidal volume during volume-targeted ventilation varies depending upon the ventilator, and the patient's compliance and resistance. Tidal volumes should be monitored closely while ventilating patients in volume-targeted ventilation.



EVALUATION OF PEAK INSPIRATORY PRESSURE DURING PRESSURE-TARGETED ASSIST-CONTROL ON THE PULMONETICS LTV 200 AND NEWPORT HT 50

Ty Barnett (Department of Respiratory Care) Lonny Ashworth

During pressure-targeted assist-control ventilation, the pressure should remain constant during inspiration. At a set pressure of 30 cm H₂O, the peak pressure (PIP) should remain at 30 cm H₂O. The peak pressures were evaluated on the Newport HT 50 and the Pulmonetics LTV 1000 in pressure-targeted assist-control ventilation. Each ventilator was connected to the Hans Rudolph Breathing Simulator (HR 1101). HR 1101 settings: resistance (RAW) 5, 15 and 25 cm H₂O/L/sec; compliance (CST) 20, 40, 60 and 80 mL/cm H₂O. HT 50 and LTV 1000 settings: rate 8/min; PIP 30 cm H₂O; PEEP 5 cm H₂O; TI 1.0 sec. PIP was the average of a minimum of five breaths, while CST and RAW were changed. The ability of a ventilator to maintain the desired peak inspiratory pressure during pressure-targeted ventilation varies depending upon the ventilator, and the patient's compliance and resistance. Peak pressure should be monitored closely while ventilating patients in pressure-targeted ventilation.

EVALUATION OF POSITIVE END-EXPIRATORY PRESSURE DURING VOLUME-TARGETED ASSIST-CONTROL VENTILATION

Ty Barnett (Department of Respiratory Care) Lonny Ashworth

During volume-targeted assist-control, the positive end-expiratory pressure (PEEP) should remain constant. At a set PEEP of 5 cm H₂O, the PEEP should remain at 5 cm H₂O. The positive pressures were evaluated on the Newport HT 50 and the Pulmonetics LTV 1000. Each ventilator was connected to the Hans Rudolph Breathing Simulator (HR 1101). HR 1101 settings: resistance (RAW) 5, 15, 25 cm H₂O/L/sec; compliance (CST) 20, 40, 60, 80 mL/cm H₂O. HT 50 and LTV 1000 settings: Rate 8/min; tidal volume 800 mL; PEEP 5 cm H₂O; TI 1.0 sec. PEEP was the average of a minimum of five breaths, while CST and RAW was changed. The ability of a ventilator to maintain the desired positive end-expiratory pressure during volume-targeted ventilation varies depending upon the ventilator, and the patient's compliance and resistance. Positive end-expiratory pressure should be monitored closely while ventilating patients in volume-targeted ventilation.

COMPARISON OF EMISSIONS DERIVED FROM THE COMBUSTION OF REGULAR GRADE DIESEL FUEL AND 100% BIODIESEL FUEL

Olivia Cunningham, Crystal Woolf, Steve Hovely, and Zac Peterson (Department of Community and Environmental Health) Dale Stephenson

Emissions from diesel engines have the potential to adversely affect human health through contributions to poor air quality. As awareness of poor air quality grows, similar growth occurs in the demand for cleaner burning fuels, like biodiesel. The purpose of this research is to evaluate differences in emissions from a diesel engine when combusting regular grade versus 100% biodiesel fuels. The null hypothesis to be tested is that there is no difference in pollutant concentrations between respective combustion emissions using both types of diesel fuel. The combustion source will be a C525 11L Cummins Diesel engine. The combustion products to be sampled are NO_x, CO, PM₁₀, and PM_{2.5}, air pollutants regulated under EPA's National Ambient Air Quality Standard. The project completion date is April 1st, 2006. It is anticipated that research results will provide preliminary data for future studies directed towards the ultimate enhancement of air quality and human health.

EVALUATION OF 6 AND 12-FOOT CIRCUIT LENGTHS ON DELIVERED VOLUME AND PEAK PRESSURE DURING CPAP/PSV ON THE LTV 1000

Dan Neifert and Matt Seitz (Department of Respiratory Care) Lonny Ashworth

The purpose of this study was to determine how 6-foot and 12-foot adult circuit lengths affect the delivered volume and peak pressure during CPAP and PSV, using the LTV 1000 for patients desiring longer circuits to provide more mobility. The LTV 1000 was connected to the Hans Rudolph Breathing Simulator (HR1101). HR1101 settings: Resistance (RAW) 10, 15, 20 and 25 cm H₂O/L/sec; Compliance (CST) 20, 40 and 60 mL/cm H₂O; rate 10/min. LTV 1000 settings: CPAP 5 cm H₂O, PSV 10 cm H₂O. A minimum of five breaths was recorded at each setting as compliance and resistance were changed, with the 6-foot circuit and the 12-foot circuit. During CPAP with Pressure Support Ventilation, at a higher compliance, even though PIP remains fairly constant, the delivered volume with the 12-foot circuit is greater than the 6-foot circuit as resistance increases.

EVALUATION OF 6 AND 12-FOOT CIRCUIT LENGTHS ON DELIVERED VOLUME AND PRESSURE DURING PRESSURE A/C ON THE LTV 1000

Dan Neifert and Matt Seitz (Department of Respiratory Care) Lonny Ashworth

The purpose of this study was to determine how 6-foot and 12-foot adult circuit lengths affect the delivered volume and peak pressure during pressure-targeted, assist-control, using the LTV 1000 for patients desiring longer circuits to provide more mobility. The LTV 1000 was connected to the Hans Rudolph Breathing Simulator (HR1101). HR1101 settings: Resistance (RAW) 10, 15, 20 and 25 cm H₂O/L/sec; Compliance (CST) 20, 40 and 60 mL/cm H₂O; rate 10/min. LTV 1000 settings: Mode Pressure A/C, Pressure 20 cm H₂O, rate 5/min, TI 1.0 sec, PEEP 5 cm H₂O. A minimum of five breaths was recorded at each setting as compliance and resistance were changed, with the 6-foot circuit and the 12-foot circuit. During pressure-targeted, assist-control ventilation there is minimal affect on delivered volume and peak inspiratory pressure when changing from a 6-foot circuit to a 12-foot circuit.



EVALUATION OF PEAK PRESSURE DURING CPAP 5 CM H₂O AND PRESSURE SUPPORT 10 CM

H₂O on the LTV 1000 and the HT 50

Alyssa Rowe (Department of Respiratory Care) *Lonny Ashworth*

During CPAP, the pressure should remain constant within the airways. At CPAP 5 cm H₂O with PSV 10 cm H₂O, the peak pressure (PIP) should be maintained at 15 cm H₂O. The peak pressures were evaluated on the Newport HT 50 and the Pulmonetics LTV 1000. Each ventilator was connected to the Hans Rudolph Breathing Simulator (HR 1101). HR 1101 settings: resistance (RAW) 5, 15 and 25 cm H₂O/L/sec; compliance (CST) 40 and 20 mL/cm H₂O; rate 12/minute; amplitude 8. HT 50 and LTV 1000 settings: CPAP 5 cm H₂O; PSV 10 cm H₂O; trigger 1.0. PIP was measured as a five-breath average while CST and RAW was changed. The ability of a ventilator to maintain the desired peak inspiratory pressure during CPAP and PSV varies depending upon the ventilator, and the patient's compliance and resistance. Peak pressure should be monitored closely while ventilating patients in CPAP with PSV.

EVALUATION OF 6 AND 12-FOOT CIRCUIT LENGTHS ON DELIVERED VOLUME AND PRESSURE DURING VOLUME A/C ON THE LTV 1000

Matthew Seitz and Dan Neifert (Department of Respiratory Care) *Lonny Ashworth*

The purpose of this study was to determine how 6-foot and 12-foot adult circuit lengths affect the delivered volume and peak pressure during volume-targeted, assist-control, using the LTV 1000 for patients desiring longer circuits to provide more mobility. The LTV 1000 was connected to the Hans Rudolph Breathing Simulator (HR1101). HR1101 settings: Resistance (RAW) 10, 15, 20 and 25 cm H₂O/L/sec; Compliance (CST) 20, 40 and 60 mL/cm H₂O; rate 10/min. LTV 1000 settings: Mode Volume A/C, VT 600 mL, rate 5/min, TI 1.0 sec, PEEP 5 cm H₂O. A minimum of five breaths was recorded at each setting as compliance and resistance were changed, with the 6-foot circuit and the 12-foot circuit. During volume-targeted, assist-control ventilation the delivered volume remained constant, but peak inspiratory pressure increased as resistance increased; however, the increased peak inspiratory pressure was similar with the 6-foot and 12-foot circuits.

EVALUATION OF THE CHANGES IN TIDAL VOLUME DURING PRESSURE-TARGETED ASSIST/CONTROL AS TIME CONSTANTS VARY WHEN FLOW-CYCLE IS ACTIVATED ON THE LTV 1000

Coby Steele and Candy Perry (Department of Respiratory Care) *Lonny Ashworth*

During pressure-targeted A/C, time is generally the cycle variable that ends inspiration. The Pulmonetics LTV 1000 allows the option of flow cycling during pressure-targeted A/C. When flow cycling is active, the parameter reached first, pressure or flow, will end inspiration. The affect on tidal volume and pressure during flow cycling was evaluated. The LTV 1000 was connected to the Hans Rudolph Breathing Simulator (HR 1101). HR 1101 settings: resistance 15, 20 and 25 cm H₂O/L/second; compliance 20, 40 and 60 mL/cm H₂O. LTV 1000 settings: pressure-targeted A/C; pressure 30 cm H₂O; TI 1.0 sec; flow cycle percent: off, 10, 20, 30 and 40%. Eight breaths were used to stabilize settings and give an average throughout changes in resistance (RAW) and compliance (CST). The time constant is calculated as the RAW X CST. During pressure-targeted A/C on the LTV 1000, if the set TI is equal to or greater than the time constant, tidal volume will decrease as the flow cycle percent increases. At TI less than the time constant, tidal volumes remained constant and the ventilator remained time cycled.



– Health Sciences –

FLUORIDE IN DRINKING WATER: A PUBLIC HEALTH OUTREACH PROJECT

Crystal Woolf and Olivia Cunningham (Department of Community and Environmental Health) Dale Stephenson

The potential health effects of fluoride in drinking water have been a topic of debate for decades. Nationwide, dental clinics and public health agencies receive numerous fluoride-related questions from concerned individuals on a regular basis. The goal of this project was to provide clear and accessible information regarding fluoride to residents of the Treasure Valley. This was accomplished through the development of a user-friendly GIS interpretive webpage placed on Idaho Department of Environmental Quality's website. This webpage provides residents with information concerning fluoride levels in drinking water. Also, brochures have been distributed to area dentist offices increasing patient awareness of the facts surrounding fluoridated drinking water and publicizing the presence of the webpage. Validation of project effectiveness continues to be through the monitoring of webpage visits. To date, preliminary results show this to be a valuable tool in helping the general public make informed decisions regarding this public health issue.



COLLEGE OF SOCIAL SCIENCES AND PUBLIC AFFAIRS

LETTING GO OF THE HARNESS FOR THE LAST TIME: A DESCRIPTIVE REALISM APPROACH TO EXPLORING THE ENDING OF WORKING RELATIONSHIPS WITH GUIDE DOGS

Deborah Allen (McNair Scholar) (Department of Sociology) Virginia Husting and Robin Allen

Podium presentation

In this research, I use a combination of feminist methodology and descriptive realism to explore my experiences and the experiences of other totally blind individuals who have ended working relationships with guide dogs. Little research has been done on the approximately eight thousand blind people who are partnered with guide dogs in the United States. A primary goal of this qualitative study is to give voice to the unique narratives of people whose experiences are rarely explored in academic literature. I blend information I gathered during interviews with five guide dog instructors, five blind authors, and ten blind participants with my autoethnography to illustrate how concepts can be applied to broader social issues, such as policies at agencies that provide guide dogs to blind individuals.



THE POLYGRAPH IN A CROSS-CULTURAL SETTING

Lorena Alvarez (McNair Scholar) (Department of Psychology) Charles Honts

This study was designed to examine possible effects of using a language interpreter (English to Spanish) during the polygraph examination. It entailed a mock crime, which was used to examine the physiological detection of deception (PDD) test. The design was a 2x2 factorial between groups with the cell size of 10 (40 participants). This study was developed to address the validity of the polygraph when an interpreter is present in an investigation. A problem arises when a section of the Latino population does not understand the English language. Most of the current research addressing the effectiveness of interpreters is in the medical field. Little research has been done in the criminal justice system. It is very important to examine if the validity of the polygraph is compromised while using an interpreter.

CUBANS IN COSTA RICA: A COLLECTION OF LIFE STORIES

Adriana Black (McNair Scholar) (Department of Anthropology) Robert McCarl

This ethnographic body of work examines the experiences of Cuban immigrants living in Costa Rica. The study aims to examine the degree of adjustment, adaptation, integration and/or assimilation of Cubans living in the small city of San Isidro del General in southern Costa Rica. This group represents a minor body of immigrants for whom Costa Rica serves as a country of first asylum and potentially as their new, adoptive homeland. Some major theoretical considerations and analytic themes that have emerged are the issues of immigrant identity through the displaced people's perspective; issues of separation from their culture and introduction to a new one; and issues of assimilation. Other analytic themes that emerged in this research relate to politics, occupational adjustments, inter-ethnic relations, family relations, socio-economic status, education, employment, and Costa Rican governments' care of the migrant population.

FINDING FREEDOM: A DISCOURSE ANALYSIS OF BUSH'S WEEKLY ADDRESSES

Macy Boggs (Department of Sociology) Michael Blain

Podium presentation

This paper employs Mann's (2003) perspective on social power to examine the use of Bush Administrations' ideological discourse of freedom and democracy to justify its imperial policies. While ordinary Americans prefer not to think of themselves or their nation as imperialist, many social scientists believe that the US is an imperial nation. President Bush's weekly radio speeches are examples of strategic discourse in which actors are subjectified through their relationship to freedom in a victimage and democracy promotion rhetoric. Using Blain's (1994) politics of victimage ritual perspective, heroes, villains, and victims are identified. These actors' identities, motives and actions in democracy promotion are described. Mann's four forms of social power – political, economic, ideological and military, are associated with victimage and democracy rhetoric.

RELIGIOSITY, GENDER, AND IMPLICIT RELATIONSHIP BELIEFS

Ashley K. Christiansen, Christine L. Pearson, Rebekah L. Davis, Miki D. Skinner, and Wind Goodfriend (Department of Psychology) Wind Goodfriend



The present study explored the associations between gender, intrinsic religiosity, extrinsic religiosity, and growth vs. destiny implicit theories of relationships. We hypothesized that females would be higher in intrinsic religiosity and growth than males, while males would be higher in extrinsic religiosity and destiny. We also hypothesized that intrinsic religiosity would be positively correlated with growth and vice versa. In females, intrinsic religiosity was found to be negatively correlated with growth beliefs [$r(37) = -.38, p = .02$]. Surprisingly, no other correlations were significant between these variables.

Implications are important and far-reaching. Due to the fact that no differences were found between the sexes in either religiosity or implicit belief systems, and the emergence of the unexpected direction of the growth correlation in females with high intrinsic religiosity, past research's applicability in this matter is questioned. Future research should more specifically examine these three factors and the interactions among them.

INVESTMENTS, COMMITMENT, AND SOCIAL SUPPORT IN ROMANTIC RELATIONSHIPS

Ashley K. Christiansen, Rebekah L. Davis, Christine L. Pearson, Miki D. Skinner, and Wind Goodfriend (Department of Psychology) Wind Goodfriend

This study expanded upon past research concerning the importance of social support for relationship investments and commitment. We hypothesized that social support would positively correlate with all four types of investments and all three types of commitment. In addition, we expected gender differences to emerge. We hypothesized that the correlations between social support, investments, and commitment would be stronger in women than in men. Social support was positively correlated with all types of both investments and commitment (r_s all $> .29$; p_s all $< .04$); however, important gender differences emerged. For males, social support was completely unrelated to levels of past intangible and planned intangible investments while females do not seem to exhibit this same hesitancy to invest. By furthering our insight into the specific variables that are associated with social support for romantic relationships, and distinguishing how these associations differ by sex, psychological research on relationships will benefit greatly.

ZERO TOLERANCE POLICING IN A RURAL SETTING

Jon Cooper (Department of Criminal Justice Administration) Andrew Giacomazzi

Podium Presentation

While most studies of zero tolerance policing take place in large urban areas, the setting for the current study is rural, adding to an emerging body of literature detailing interaction between rural officers and citizens. It is hypothesized that because greater informal social control tends to exist in

rural areas as compared to urban areas, rural zero tolerance policing will not result in decreases in serious crime. Further, it is hypothesized that with the implementation of zero tolerance policing, a rural agency will experience an increase in complaints against the department. To explore both hypotheses, a before-and-after design was employed using agency data. City council minutes and letters-to-the-editor were used in a content analysis to further explore the second hypothesis. Results from this study show support for the first hypothesis. The second hypothesis does not appear to be supported by the quantitative data. Discussion of this phenomenon is presented.

STUDENT DEVELOPMENT THEORY AND LISTENING THEORY: CONNECTIONS, IMPLICATIONS AND PRACTICE

Clay Cox (Department of Communication) Laurel Traynowicz

Podium presentation

General listening theories and established student development theory both place the responsibility for creating meaning upon the listener. This primary role in creating meaning in both frameworks was established first by revealing how listening theory places the responsibility for creating meaning upon the listener. The same responsibility exists in student development theories; the student is ultimately accountable for her or his own understanding and education. The connections between these two theories have implications for students and their academic advisors. Understanding the primary role of the listener/student could benefit both the student and the advisor. This research connects these two theoretical perspectives and explores the potential benefits of informing both student and advisor of the implications.



THE INFLUENCE OF CRIMINAL CONVICTION ON PERCEPTIONS OF EMPLOYABILITY

Liva R. Cox (Department of Psychology) Mary Pritchard

Ex-convicts face many obstacles after the completion of their sentences, not the least of which is obtaining a job. Employment has been found to be an essential component of ex-offenders' ability to reintegrate into society, and it has also been shown to affect recidivism rates. However, the stigma of a criminal conviction often follows an ex-offender into the marketplace, creating a sometimes insurmountable obstacle to gainful employment. The present study extends previous findings of bias in the employment of ex-offenders, in that ex-offenders are found to rank significantly lower than both politicians and used-car salesmen – two extremely low-ranking occupations – in terms of employability. The influence of criminal conviction on the ranking of potential applicants is also perceived to be substantial when considering the opinions of the average employer.

SELLING VOTERS SHORT: A RHETORICAL ANALYSIS OF WAL-MART'S USE OF NAZI IMAGERY TO INFLUENCE CITIZENS

Kristin L. Davidson (Department of Criminal Justice Administration) Dawn Craner

Performing Arts Session

On May 8, 2005, Flagstaff Arizona residents opened up their Arizona Daily Sun newspapers and were exposed to a full-page advertisement sponsored by the Wal-Mart Corporation, opposing Proposition 100, a local zoning ordinance. The advertisement utilized a significant historical image as a marketing tool to convince residents that their rights were being threatened. I posed the research question: With historical images becoming increasingly thrust upon us as tools for advertising, will the lessons learned from the original contextual message of the image be forced to take a back seat to a product or idea presently being marketed? To attempt to answer this question, I first explored the Wal-Mart-sponsored ad against Proposition 100. I then examined Judith Williamson's "Historical Images in Advertising" Theory, and finally, I used Williamson's theory to analyze the advertisement, focusing on serious implications that can result from this type of mass media communication.

COGNITIVE BIASES ABOUT ROMANTIC PARTNERS: A UNIVERSAL TENDENCY

Rebekah L. Davis, Ashley K. Christiansen, Christine L. Pearson, Miki D. Skinner, and Wind Goodfriend
(Department of Psychology) Wind Goodfriend

Much research to date has established that maintaining a positive self-esteem is a fundamental human need. One way of maintaining positive self-esteem is to use a variety of cognitive biases about the self. Recently, work from the field of romantic relationships has examined whether people utilize the same types of cognitive bias for their partner that they use for themselves. Labeled "partner-esteem bias," this phenomenon occurs when individuals transfer the esteem they have for themselves onto the esteem they feel for their partner, and vice versa. The present study looked at whether 31 factors, including general social desirability, relationship-specific social desirability, and attachment styles would correlated with partner-esteem bias. In fact, none of the 31 factors had an effect on the amount of bias shows. It may be the case that maintaining positive partner-esteem is simply a fundamental human tendency.

ROMANTIC PARTNERS: COGNITIVE BIASES INFLUENCED BY COGNITIVE LOAD

Rebekah L. Davis, Miki D. Skinner, Christine L. Pearson, Ashley K. Christiansen, and Wind Goodfriend
(Department of Psychology) Wind Goodfriend

One way of maintaining positive self-esteem is to use a variety of cognitive biases. Recently, work from the field of romantic relationships has examined whether people utilize the same types of cognitive bias for their partner that they use for themselves. Labeled "partner-esteem bias," this phenomenon occurs when individuals transfer the esteem they have for themselves onto the esteem they feel for their partner, and vice versa. The present study examined the extent of cognitive effort one must employ when using the bias. This type of distraction is termed cognitive load. As predicted, individuals showed less of a bias when under cognitive load as opposed to not being under cognitive load (i.e. undistracted). This is not to say that individuals are lying when reporting how great their partner is, but they may be consciously exaggerating the amount of greatness their partner actually holds.

ADULT ATTACHMENT AND HIGH-RISK DRINKING: DRINKING MOTIVES AS A MEDIATOR

Jenna Elgin (McNair Scholar), Lisa McKinley, and Kate Haralson (Department of Psychology) Diana Doumas



Heavy drinking on college campuses and the negative consequences associated with alcohol use have been well-documented. Attachment theory provides a way to conceptualize the use of alcohol as a strategy to regulate emotions and interpersonal situations. Research indicates the attachment variable negative model of self is associated with alcohol-related consequences and this relationship is mediated by the drinking motive emotional coping. The goal of the current study was to extend the literature by examining drinking motives as a mediator in the relationship between attachment and high-risk drinking in a sample of

168 college students recruited from General Psychology sections. Results of a series of hierarchical regression analyses indicated the relationship between attachment anxiety and alcohol-related problems was partially mediated by emotional coping, whereas the relationship between attachment avoidance and alcohol-related problems was partially mediated by conformity. Results add to our understanding of the complex relationship between drinking motives and high-risk drinking.

GENDER DIFFERENCES IN DISORDERED EATING AND ITS CORRELATES

Jenna Elgin (McNair Scholar) (Department of Psychology) Mary Pritchard

The goal of the present study was to examine gender differences in the prevalence of disordered eating and body dissatisfaction as well as examine gender differences in several risk factors: mass media, self-esteem, and perfectionism. As expected, women experienced more symptoms of disordered eating as well as body dissatisfaction than did their male counterparts. There were also gender differences in the risk factors. For women, mass media, self-esteem, and perfectionism related to disordered eating behaviors, whereas for men, only perfectionism and mass media related to

disordered eating behaviors. For women, mass media and self-esteem related to body image dissatisfaction, whereas for men, mass media and perfectionism related to body image dissatisfaction. The results of the present study indicate risk factors for disordered eating and body dissatisfaction for men and women may be different, which has implications for understanding the etiology of body dissatisfaction and disordered eating and for possible treatment interventions.

USING DIARY METHODOLOGY TO STUDY DRINKING: IS REACTIVITY A PROBLEM?

Jenna Elgin (McNair Scholar) and Lisa McKinley (Department of Psychology) Diana Doumas

Recently, diary methodology has been used as a data collection strategy in many areas of psychology, including studies on alcohol use. Despite its advantages, some have questioned whether completing daily diaries affects the behavior being studied, which would impact the study outcomes. The aim of the current study was to examine reactivity in an alcohol use diary study. Our primary research question was whether or not completing daily diaries as part of a diary study changes participant drinking during the study. Community participants completed daily diaries over a period of 28 days. Initial levels of drinking reported at the onset of the study were compared with levels of drinking throughout the study. Results indicated that participants did not significantly reduce their drinking while in the study. These findings lend support to the view that tracking behavior using diary methodology does not influence the behavior being monitored. These findings add to the literature indicating in research studies, where changing the behavior is not the goal, behavior is not affected by diary self-monitoring.



FACULTY ATTITUDES TOWARD UNDERGRADUATE SUBMISSIONS TO REGIONAL CONFERENCES

Courtney Haines (Department of Psychology) Eric Landrum

There are no published evaluation standards for students to follow when submitting to an undergraduate conference. How a student can go about submitting a research project is clear but the evaluation standards are not. The role of undergraduate conferences is to provide students with a chance to gain experience in the field. A survey was mailed out to 500 randomly selected psychology instructors across the nation, all of whom are APA members and from The Society for Teaching Psychology. The study clarified the role of undergraduate conference. Respondents believe the experience of conference participation outweighs the quality of the research submitted at the undergraduate level, assuming quality can improve based on experience. Confidence built by participating at conferences is an important factor. The role of the student section at conferences is more of a learning experience and the evaluation standards for the student section should mirror that.

ADULT ATTACHMENT, SELF-CONCEPT AND EMOTIONAL DISTRESS: A STRUCTURAL EQUATION-MODEL

Kate Haralson, Jenna Elgin, and Christine Pearson (Department of Psychology) Diana Doumas

Attachment theory provides understanding of the interpersonal functioning of adults. Individuals develop internal working models of the self and others based on early experiences. The dimensions of self, characterized by attachment anxiety, and other, characterized by attachment avoidance, underlie many conceptualizations and measurement strategies of adult attachment. The goal of this study was to examine the relationship of adult attachment to psychological distress and the mediating role of self-esteem using structural equation-modeling. The participants were 198 students from General Psychology sections. Participants were asked to complete a questionnaire. Results of a partial-mediation model indicate self-esteem partially mediated the relationship between attachment anxiety and psychological distress. In contrast, attachment avoidance was not related either self-esteem or psychological distress. Clinical implications include assessing attachment anxiety to identify high-risk patients for depression and anxiety, and that increasing self-concept and decreasing fears about relationships may be useful intervention strategies in treating psychological distress.

DRINKING-RELATED PROBLEMS IN COLLEGE FRESHMEN: WHO IS AT RISK?

Kate Haralson (Department of Psychology) Diana Doumas

Alcohol abuse represents a significant problem on college campuses, which contributes to significant alcohol-related consequences. Freshmen, males, and athletes have been identified as high-risk groups for alcohol abuse and related consequences. The aim of this study is to examine athletic status and gender as risk factors for heavy drinking and associated problems. It was hypothesized that athletes and males would have higher levels of drinking quantities and alcohol-related consequences than non-athletes and females. Participants were 457 freshman students from General Psychology sections. MANOVAs were conducted to examine effects of athletic status and gender for drinking quantities and alcohol-related consequences. As hypothesized, athletes reported higher levels of all drinking quantity variables and alcohol-related consequences than non-athletes. Also as hypothesized, males reported higher levels of all drinking quantity variables than females, but unexpectedly reported higher levels of dangerous consequences only. Clinical implications include developing prevention and intervention strategies targeting males and athletes.

INTIMATE PARTNER VIOLENCE AND COMMUNICATION: DYADIC SATISFACTION AS A MEDIATOR

Kate Haralson and Christine Pearson (Department of Psychology) Diana Doumas

Although intimate partner violence has been studied from a broad range of theoretical perspectives, researchers have begun examining domestic violence from a systems approach, examining predictors of violence within a couples framework. Although both communication and relationship satisfaction have been identified as predictors of intimate partner violence, the mediational relationship among communication, satisfaction, and violence has not been examined. The goal of the present study is to extend the literature by examining relationship satisfaction as a mediator in the relationship between communication and violence in 70 community couples. Results of hierarchical regression analyses indicated that relationship satisfaction fully mediated the relationship between communication and intimate partner violence. This finding suggests relationship satisfaction accounts for the association between communication and intimate partner violence. These results are consistent with a model in which poor communication may foster the development of dissatisfaction within a relationship which may then lead to intimate partner violence.

TRUST, RECIPROCITY, AND RESOURCES: USING EXPERIMENTAL GAMES TO UNDERSTAND PERSPECTIVES OF COLLEGE STUDENTS

Kersti Harter, Eric Kennedy, Skyler Sweat and Chris Carpenter (Department of Anthropology) John Ziker

Game theory contributes to evolutionary models of cooperation, the development of social norms and coalitions, bargaining, cheating, and monitoring. Following game theory models of cooperation, Dr. John Ziker's Anthropology 497 (Fall 2005) class conducted a series of experimental games at Boise State University in order to investigate student perspectives on trust, reciprocity, and common-pool resources. Anthropology 102 students participated as research subjects. The experimental games are controlled scenarios in which individuals make choices in collective action problems represented by an experimental endowment. Students in Anthropology 497 implemented the game protocols, collected data on individual socio-economic variables, and recorded participant responses, and participated in statistical analyses of the results. Participant choices were analyzed in light of independent data collected in the pre-game interview. Household size, self-reported payoffs to household cooperation (Likert scale), and age were among the most significant correlates of decisions, indicating the importance of micro-social environments on decision-making.

MY PLACE IN THE UNIVERSE

Camille Levi (Department of Communication) Dawn Craner

Performing Arts Session

An oral interpretation program constructed around a central theme, this artistic presentation was designed to share with an audience a variety of poetic texts woven together to speak to the notion of the program title above, "My Place in the Universe." Twisting and turning through variations on that theme, this performance attempts to name such a place by asking a question that lies at the

foundation of the human psyche: "Why am I here?" Carefully composed to address such a critical question, this program relies on and artistically displays poetry by Billy Collins, Allison Hawthorne Deming, Rita Dove, & Tim Siebles.

THE ROLE OF SLEEP, STRESS, AND COPING STYLES ON ANXIETY AND DEPRESSION

Jodi Lezamiz (Department of Psychology) Mary Pritchard

Previous research has examined the relation between sleep and mental health in adolescent and elderly populations. The goal of this study was to examine the relation between college students' sleep habits and their mental health, particularly anxiety and depression. It was found that individuals with sleep disturbances may be at risk for depression and anxiety. Another goal of this study was to do an exploratory analysis of stress, coping strategies, and sleep to discover which variables would best predict depression and anxiety. Avoidant coping was the best predictor followed by sleep disturbances for both depression and anxiety. The sex of an individual may also have a negative effect on one's sleep, specifically women.

PERCEPTIONS OF STUDENT ATHLETES

Kareem Lloyd, Tara Battiato, Zeb Rodes, and Lindsey Hopkins (Department of Communication)
Laurel Traynowicz

Previous research indicates that student athletes at American universities are often awarded the status approaching that of celebrity. University athletes who participate in revenue-generating sports in particular are often viewed from afar during sporting events and therefore may be perceived at times by student peers as having a status closer to star than student. A pilot study conducted in Fall 2005 surveyed and interviewed (via focus groups) 50 university students regarding their perceptions of student athletes. That study indicated an approximately equal number of peers who regarded student athletes as star and student. In the followup study more intensive focus groups of both student athletes and nonathletes, male and female, were conducted with the aim of understanding what elements of the student athlete persona are relevant when the status of "celebrity" is in place versus the status of "student." Additional variables such as access to student athletes, sex, age, and ethnicity were examined as the image of student athlete was explored.

INTIMATE PARTNER VIOLENCE: THE INTERACTION BETWEEN ATTACHMENT ANXIETY AND ATTACHMENT AVOIDANCE

Lisa L. McKinley and Christine L. Pearson (Department of Psychology) Diana Doumas

Attachment theory provides a useful model for understanding the co-occurrence of violence and intimacy within the same relationship. While the literature has largely focused on the attachment of the male perpetrator, and to some extent the female victim, the interaction between partners' attachment styles within a couple has been understudied. This study extends the literature by examining the interaction between the attachment style of both partners in a couple as a predictor of domestic violence in 49 community couples. A combined report of attachment and physical violence for each partner was obtained by summing the self-report and partner-report of attachment and violence. Results of hierarchical regression analyses indicated the interaction of male attachment anxiety and female attachment avoidance predicted intimate partner violence. This "mispairing" of attachment styles significantly predicted male-perpetrated violence, and approached significance in predicting female-perpetrated violence. These findings are consistent with research indicating the reversed pursuer-distancer pattern is associated with violence.

MOOD, STRESS, AND ALCOHOL USE AS PREDICTORS OF PHYSICAL SYMPTOMS

Lisa L. McKinley and Kate Haralson (Department of Psychology) Diana Doumas

Although the relationships between mood, stress, alcohol consumption, and health outcomes have been widely studied, there has been relatively little research exploring these relationships in a daily context. The goal of this study was to add to the literature by examining the relationship of mood, stress, and alcohol use to health-related variables using daily diary methodology. Twenty-one community participants completed a daily diary survey twice a day across 28 days. Responses were aggregated, resulting in mean scores for each participant for each item across the 4 weeks. Results of

a hierarchical regression analysis, indicated mood, stress, and alcohol use accounted for 47% of the variance in reported physical symptoms. Although mood significantly predicted physical symptoms, neither stress nor alcohol consumption were significant predictors. Results of this study indicate the importance of daily mood as a predictor of health-related variables. Clinical implications include focusing on improving mood to improve physical complaints.

TELEVISION TALK SHOWS AND THEIR INFLUENCE ON LOCAL CULTURE

Chad Mendenhall, Jessica Christensen, Amy Tucker, Chris Fernandez and Marshall Wolfe (Department of Communication) Laurel Traynowicz



The introduction of television talk shows in the 1950s has evolved into a contemporary television environment in which a large number of such shows are televised at several times of the day, in similar yet different formats, with a variety of hosts. The relative influence of these shows on American culture has been documented, from murder based on the on-air revelation of infatuation of a gay to a straight man, to the books people are reading based on "Oprah's list." The pertinence of television talk shows to the local culture can only be estimated based on national research. In this study the local culture of people in the Treasure Valley was probed for influences by television talk shows. With over 100 individuals responding to a survey, results indicated that most of the subjects watched one to four hours of talk shows per week with the aim of relaxation and entertainment. Reliability of the information from talk shows, influence of talk show content on personal political views and accuracy of talk shows' representations to respondents' daily life were all reported as primarily negative (disagree to strongly disagree). Despite these reports, subjects indicated that talk shows were frequently discussed with family and friends. The uses of televised talk shows as entertainment, information and conversational foundation were found to intertwine and occasionally contradict each other.

HEALTH KNOWLEDGE OF UNDERGRADUATE STUDENTS

Kelly P. O'Rourke (Department of Psychology) Mary Pritchard

This study examines the health related knowledge of undergraduate students at Boise State University. The administered survey measured perceived knowledge versus actual knowledge in three aspects of everyday wellness: nutrition, physical fitness, and sleep. Results show a significant difference between students' perceived knowledge and their actual knowledge levels on the above stated wellness topics. Most students do not have an accurate perception of their personal health knowledge. The survey also measured students' knowledge of breast cancer and eating disorders. Female participants demonstrated higher levels of knowledge than male participants on these two topics. Students had the most difficulty answering questions in the following areas: Eating disorders: who is most likely to develop an eating disorder, the likelihood of recovery, and long term consequences of having an eating disorder; Breast cancer: risk of developing breast cancer, causes of breast cancer, warning signs, statistic terminology, and self-check information.

THE MEATRIX HAS YOU: COMMUNICATION ANALYSIS

Wayne Rysavy (Department of Communication) Dawn Craner

Performing Arts Session

This genre of scholarship involves an examination of the ideas, devices, and themes employed in a specific form of communication artifact, e.g., a speech, a movie, a commercial, or possibly a work of visual art. The artifact is investigated using a theory that enables a clarifying perspective for a focused analysis. In "The Meatrix Has You," a flash clip (presented at www.themeatrix.com) is examined through use of Walter Fisher's Narrative Rationality Theory. As a result, issues and implications of our nation's mass production and consumption of meats and animal products as presented in The Meatrix begin to stand out boldly. Finally, the listening audience must confront their own personal consumption of such products as they face humorous, but serious, accusations from The Meatrix.

DESTINED TO INVEST: PERCEIVED INVESTMENT IMPORTANCE AND GROWTH VERSUS DESTINY

Christine L. Pearson (McNair Scholar), Miki D. Skinner, Ashley K. Christiansen, Rebecca L. Davis, and Wind Goodfriend (Department of Psychology) Wind Goodfriend

This study expanded upon research on relationships and Implicit Theories of Relationships (ITR) concerning the possible association between the ITR constructs of growth/destiny and the perceived importance of relationship investments. Pearson and colleagues (2005) found that destiny beliefs were positively correlated with having higher levels of both tangible and intangible investments in one's current relationship, whereas growth beliefs were correlated with neither type of investment. Building on Pearson's previous work, the present research was designed to determine if growth or destiny is also correlated with perceived importance of investments. Results indicated destiny beliefs were positively correlated with thinking that both types of investments were important and growth beliefs were not correlated with perceived importance of either type of investment. Intangible investments were marginally correlated with relationship type. These data provide insight into both ITR theory and investment theory, and the thinking processes of individuals within romantic relationships.

A LACK OF SOURCE MONITORING IN A CLASSROOM SETTING: THE MISINFORMATION EFFECT

Christine L. Pearson (McNair Scholar), Wind Goodfriend, Robert Ferguson, and Jessica Kisling (Department of Psychology) Wind Goodfriend

It has now been more than three decades since Loftus and Palmer (1974) demonstrated that misleading post-event information can alter memory reports of an event. However, to date no research has been conducted investigating the misinformation effect in a classroom setting. College students have many sources of course-relevant information, including the instructor's comments, the textbook, and comments and questions from other students in the class. These sources of information are not equally reliable. In this study students viewed a film in class and were given a memory test to explore the misinformation effect in a naturalistic classroom environment. Misinformation from a low-credibility source (another underclassman) resulted in significantly less memory errors, compared to misinformation from a medium- or high- credibility source (a senior student or a professor). This would seem to be good news for instructors who are concerned about the numerous sources of potential misinformation in the classroom.

PREDICTING EVENING ALCOHOL USE FROM DAYTIME STRESS, MOOD, PHYSICAL SYMPTOMS AND ALCOHOL-RELATED CONSEQUENCES

Christine L. Pearson (McNair Scholar), Kate Haralson, and Lisa McKinley (Department of Psychology) Diana Dumas

The etiology and consequences of alcohol use are complex and multidimensional. Researchers have identified motivational models for the etiology of alcohol use, including the tension reduction hypothesis and positive experience enhancing model. Directly following from these models, both drinking to cope with stress and negative emotions and positive expectancies have been widely studied as risk factors for the etiology of alcohol abuse. Therefore, the aim of this study was to add to extant literature by examine reports of mood, stress, physical symptoms and alcohol-related consequences occurring as predictors of evening drinking. Results indicated low levels of negative mood states and high levels of daytime stress were related to high levels of evening alcohol use. These findings have important implications for treatment in identifying low levels of negative mood and high levels of stress during the day as predictors of evening alcohol use.

UNDERSTANDING CODEPENDENCY: INTRAPERSONAL AND INTERPERSONAL PREDICTORS

Christine L. Pearson (McNair Scholar) and Kate Haralson (Department of Psychology) Diana Dumas

Codependency has been defined as a set of maladaptive and compulsive interpersonal behaviors. Conceptually, codependency encompasses both one's emotional well-being, and how one relates to others. Although limited research has demonstrated a relationship between codependency and

variables like self-esteem and relationship functioning, little is known about its relatedness to intrapersonal and interpersonal functioning outside of the context of alcohol research. The purpose of this study was to extend extant research on codependency by exploring the relationship of codependency to depression, attachment style, dyadic adjustment, and social intimacy. Participants were 198 general psychology students (65 male, 133 female) recruited from General Psychology sections. Results of a hierarchical regression analysis indicated codependency was predicted by depression, anxious attachment, relationship satisfaction, and social intimacy. This study adds to the literature defining the construct of codependency, and indicates that codependency can, in part, be defined in association with interpersonal and intrapersonal variables.

THE EXPERIENCES OF UNDOCUMENTED "MEXICAN" WOMEN IN CANYON COUNTY

Liliana Rodriguez (McNair Scholar) (Department of Multi-Ethnic Studies) Robert McCarl

The experiences of undocumented women from Mexico are drawn through an ethnographic fieldwork study (in-depth interviews). Undocumented women residing in Canyon County, in the state of Idaho share their difficulties and triumphs as undocumented women. The undocumented population in Canyon County has received increasing attention from the media in the state of Idaho. Undocumented women often lack voice in the academic and political discussions surrounding them. This study gives undocumented women a voice in these discussions. They provide a unique view often absent in discussions on illegal immigration. Why they risk everything to migrate and stay in the United States.

DIFFERENCES IN ACCEPTANCE OF SEXUALLY DEVIANT BEHAVIORS

Amy K. Schaeffer (Department of Psychology) Eric Landrum

This study examined the relationship between age and the acceptance of sexually deviant behaviors and whether males are more likely than females to view certain sexual behaviors as less deviant. Sixty-six college students participated in this survey study. There was a positive correlation between age and acceptance of sexually deviant behaviors. There were also significant differences between males and females in response to whether or not they viewed certain sexually deviant behaviors as acceptable. The purpose of this study was to identify whether or not gender and age play a role in labeling certain sexual behaviors as deviant. This research suggests that gender and age are factors in establishing a norm for what sexual behaviors are considered to be acceptable and what sexual behaviors are considered to be deviant.

THE EFFECT OF SELF-ESTEEM ON GENERAL HEALTH, DISORDERED EATING, EXERCISE, ANXIETY, DEPRESSION, STRESS, COPING, PERFECTIONISM AND GENDER

Maureen Shea (Department of Psychology) Mary Pritchard

This study examined self-esteem as the primary predictor of certain pathologies such as depression, anxiety, harmful exercise levels and disordered eating. A survey was conducted to measure levels of self-esteem and a variety of other health behaviors in undergraduate students at Boise State University. We conducted stepwise regressions to determine which of several variables (self-esteem, high stress, poor coping skills, maladaptive perfectionism, and gender) best predicted depression, anxiety, harmful exercise levels and disordered eating. The results indicated that self-esteem was a secondary predictor for bulimia, drive for thinness, anxiety, and body dissatisfaction. It was a tertiary predictor for depression and emotional eating. It did not predict aerobic or anaerobic activity. Future research should further investigate how self-esteem interacts with other predictor variables to better flesh out the relationship between self-esteem and mental health.

LIFE IS SHORT: THOUGHTS OF DEATH AND FRIENDSHIP PLANNING

Miki D. Skinner, Christine L. Pearson, Ashley K. Christiansen, Rebekah L. Davis, and Wind Goodfriend (Department of Psychology) Wind Goodfriend

Previous research on terror management theory has established that increased awareness of one's own mortality, referred to as mortality salience, leads to increased bonds between an individual and his or her social in-groups. The hypothesis of the current study was that increased mortality salience would

lead to a greater desire in individuals to feel connected to close friends through the perception that those friendships have a solid future. In order to test this hypothesis, we asked individuals to consider the plans they had for the future of their friendships, and how much progress they currently had made toward those plans. Participants were exposed to increased mortality salience regarding either their own death, the death of a best friend, or a control condition. Those asked about their own death reported the least amount of plan progress within their friendships, revealing an increased motivation to achieve interpersonal goals related to existential attachments.

TERROR MANAGEMENT THEORY AND COMMITMENT TO FRIENDSHIP

Miki D. Skinner, Ashley K. Christiansen, Rebekah L. Davis, Christine L. Pearson, and Wind Goodfriend
(Department of Psychology) Wind Goodfriend

Terror management theory suggests that due to the natural will to survive, a person will exhibit defensive cognitive behaviors when faced with the awareness of his or her own death. Previous research has shown on numerous occasions that increased mortality salience tends to result in individuals feeling a greater sense of belonging and a desire to be associated with others. The goal of the current study was to investigate the association between death anxiety and commitment to a best friendship. Participants were exposed to increased mortality salience regarding either their own death, the death of a best friend, or a control condition, and then rated a modified version of the Rusbult, Martz, & Agnew (1998) commitment scale. Surprisingly, participants exposed to either death anxiety conditions were less likely to be committed to their best friendship compared to the control condition.

PALEOENVIRONMENTAL TRANSFORMATIONS

Skylar S. Sweat (Department of Anthropology) Christopher L. Hill

Long-term change in environment is reflected in the geological record. This research looks specifically at the change in types and amounts of sedimentological and paleobiotic evidence as it relates to past environments. The environmental conditions in terms of sediments found in the Egyptian Sahara Desert provide a record of change over time. Past environmental conditions can be determined on a number of factors, such as the composition of the deposits. In addition to sediment depositional relationships, biological associations, such as the types and abundances of certain plant taxa (palynological evidence), assist in determining the conditions of paleoenvironments. For instance, analysis of fluctuations or the presence and absence of certain pollen types in the geologic record from the American Southwest suggest that specific environmental conditions were present in the past. These two examples illustrate how information from sediments and plants can provide information on paleoenvironmental transformations in arid regions.

EFFECTS OF TEAM-BASED REWARDS AND FEEDBACK ON FAIRNESS REACTIONS

Julia Szpakiewicz and Amy K. Schaeffer (Department of Psychology) Vincent Fortunato

This study examined how individuals working in a team setting reacted to the allocation of rewards based on team goal attainment (reward versus no-reward) and feedback regarding their own individual level of contribution ("better than others" versus "worse than others"). Hypotheses were generated based on two competing motivational theories: Equity Theory and Expectancy Theory. Eighty-nine students enrolled in a Psychology 101 course participated in this study for credit and were asked to fill out several 'reaction' measures following the reward and feedback manipulations. A multivariate analysis of variance and follow-up univariate tests indicated that, in general, (a) individuals who were rewarded and (b) individuals who were told that they performed better than others reacted more favorably than individuals who weren't rewarded or were told that they performed worse than others. Additional statistically significant interactions were also found that provided partial support for both equity and expectancy theory.

PERCEIVED ACCESS TO MENTAL HEALTH CARE AND ITS EFFECTS ON WELL-BEING

Jordan Tabb (Department of Psychology) *Eric Landrum*

Conducted at a metropolitan university in the Intermountain West, this study examines the relationship between perceived availability of mental health care services and five measures of mental well-being. There is a significant relationship between perceived access to mental health care and coping ability in response to traumatic events, but no significant relationship between perceived access to mental health care and depression, anxiety, stress or coping ability in response to persistent stressors. Future researchers should examine perceptions of mental health care services and measure any relationships between those perceptions and mental well-being.

PERSONALITY CHARACTERISTICS AS PREDICTORS OF HEALTH RISK BEHAVIORS

Adam Torres (McNair Scholar) (Department of Psychology) *Mary Pritchard*

Five personality dimensions—extraversion, agreeableness, conscientiousness, neuroticism, and openness – were studied as potential predictors of health risk behaviors. Two hundred ninety-six college undergraduates took a youth risk survey that investigates four types of risky behavior: Delinquency, smoking and drinking, disorderly eating, and engagement in risky sexual behavior. There were significant correlations between specific health risk behaviors and dimensions of personality. Tobacco users displayed significantly lower levels of conscientiousness, and alcohol users had significantly higher levels of extraversion, neuroticism and openness. Individuals who were dissatisfied with their body weight displayed higher levels of neuroticism. Additional results revealed sex differences in neuroticism, violence, marijuana use and other drug use.

WAR ON PERCEPTION

Ryan Turner, Scott Kelly, Chris Cannon, Armando Martinez, and Cameron Gunn (Department of Communication) *Laurel Traynowicz*



The media play several roles in the communication of war events. Media serve as transmitters of information and critical evaluators of that same information. Public perception of war events and the information gleaned from media were examined in this study. Fifty individuals were surveyed regarding their perceptions of events prior to, during and after the first part of the Iraq war. Three main perceptions and misperceptions were explored: The existence of weapons of mass destruction, linkages between Saddam Hussein and al Qaeda, and public opinion in favor of or opposition to the war in Iraq. Respondents'

reported perceptions were related to three variables: The major source of news from which subjects received information, their support or lack of support for George W. Bush in 2004, and political party identification. Results indicated a strong positive correlation between primary source of news, political affiliation and support for President Bush with accuracy of war perception. While temporality of variable order couldn't be determined from this study, the influence media have on viewer perception was strongly supported.

HOW SPORTS FANS COMMUNICATE: THE FACTORS THAT INFLUENCE BEHAVIOR

Mark Thomsen, Allison Hernandez, Danielle Smith, Andy Archer, and Michelle Hessing (Department of Communication) *Laurel Traynowicz*

Watching and attending sporting events is a major pastime for many American who identify themselves as "sports fans." Verbal and nonverbal methods of expressing team or sport support and assuming a social identity as a sports fan vary widely, and public sports fan identification via communicative behavior is compounded by several different variables. In this study the covariable of alcohol use was studied in relation to public sports fan behaviors. Seventy-eight fans attending or watching (via television) a local university home football game were surveyed. Two in-depth

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interviews were conducted with informants identified as regularly observing sports fanaticism behavior. Results indicated that 91% of the sports fans surveyed reported consuming one to more than eleven alcoholic drinks in a regular week. Of these same subjects 96% consumed alcohol during or before the local home football games, but the proportion of subjects consuming excessive amounts of alcohol was significantly greater during football games than during a regular week. All of the subjects who reported engaging in aggressive behavior at local football games had been drinking excessively during or before the game (eleven drinks or more). The direct relationship between fans' alcohol consumption and level of aggressive behavior was supported, as was the notion that local football games are considered social events that called for social activity (such as parties and drinking). Implications for the social identity of sports fans and other issues such as stadium safety were explored.

KING KONG: MONSTER FOR ALL ERAS

Olivia Umphrey (Department of History) Todd Shallat

Podium presentation

With the release of King Kong in December 2005, we were once again transported to the world of Kong, Ann Darrow and Carl Denham. For 70 years, the Kong movies have attracted audiences. As films can be viewed as cultural artifacts, which speak about the eras they were made in and the audience they were made for, one wonders how one story can span across decades. This project seeks to answer what it is about the Kong films that have allowed them to reach such vast audiences and have success over the years.



WORKPLACE INCIVILITY

Cindy Wolff (Department of Psychology) Vincent Fortunato

In a time where many believe rudeness and insensitivity toward others has proliferated to new heights, there has been an increased interest in the need for civility. Workplace civility as a behavior involves politeness and regard for others in the workplace, whereas workplace incivility involves intentional rudeness and a general disregard for others. This has less to do with formal rules of etiquette than with demonstrating sensibility of concern and regard. Although the monetary costs of incivility in the workplace are still unknown, research shows that incivility corrodes organizational culture. Employees on the receiving end of incivility will respond in ways that are costly to their organizations. This study explores the antecedents of workplace incivility and presents a model for its investigation.

IMPACT OF A POSITIVE ATTITUDE ON BREAST CANCER RECOVERY

Christy Zenner (Department of Psychology) Mary Pritchard

Breast cancer is a serious disease that ends thousands of lives each year. This study documents the importance breast cancer survivors place on their attitude in regards to their recovery from breast cancer. The participants in this study consisted of eight women who were in a breast cancer survivors support group. It was hypothesized that the participants would believe that having an optimistic attitude is important for recovering from breast cancer, that an individual's attitude plays an important role in determining whether or not the individual joins a support group, and that having a positive attitude provides you with more social support than what you would have if you had a negative attitude. All participants supported these hypotheses.

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BSU FAMILY STUDIES INITIATIVE, BSU SERVICE-LEARNING PROGRAM

Civic Engagement in Action

Civic Engagement in Action, an interdepartmental group of posters co-sponsored by the BSU Family Studies Initiative and the BSU Service-Learning Program, is designed to recognize research-based projects completed by students to meet service-learning requirements. The six project posters displayed here were selected as "best of show" from a larger number of posters displayed at a special presentation in December of 2005.

THE IMPORTANCE OF PLAY

Natalie Aurich, Patricia Young, Jami Carbray, Tricia Reiersen, Stacey Marshall, and Jennifer Kotmel

Recent research has cited the importance of play for the development of cognition, language, social and emotional, and motor development. These domains are necessary for a child to be ready for Kindergarten. However, early childhood programs have become more academic and adult directed as due to the current emphasis on academic achievement and high stakes testing. In support of the efforts of the Idaho Infant and Early Childhood Mental Health System of Care, a service-learning project was created to inform various audiences of the importance of play.

NUTRITION EDUCATION FOR NEW AMERICANS

Tyler Baker, Nicholas Bock, Zana Delic, Mitsue Kamitani, Leah Kirk, Charlie Spencer, and Pilar York

As one of the groups chosen to work with the Agency for New Americans, we chose to focus our intervention on the Somali Bantu refugee group, and to educate them on healthy nutrition and hygiene habits, emphasizing prevention of future illnesses and maintenance of health. The Somali Bantus enjoyed the presentation and will benefit from follow-up interventions to cement the information they have been given and to further understanding of the concepts.

EL-ADA COMMUNITY ACTION PARTNERSHIP: HEPATITIS C INTERVENTION

Courtney Cantrell, Karlene Fife, Annie Gilbert, David Iturriaga, and Jonathan Richards

Many indigent people are considered high risk for hepatitis C because of their current behaviors and lack of awareness. We were successful in providing useful access to important information for health promotion through a personalized intervention with an emphasis on positive outcomes of precautionary behaviors, including a fact brochure concerning hepatitis C prevention, an insert with local testing and support group contacts, and a notice on susceptibility, transmission, and detection, all tailored to the predicted literacy level of El-Ada clients. Reduction in the incidence of hepatitis C can assist in eliminating poverty in our community, but future contributions are necessary.

BABY STEPS: THE HAZARDS OF SMOKING, ALCOHOL, AND ILLEGAL DRUGS ON PREGNANCY

Jennifer Flynn, Jessica King, Gina Post, Danielle Perryman, Erin Jermann, Stephani Brown, and Maila Howell

We presented information pertaining to three different substances that these women may be using. We inform them about the side-effects that these substances have on their unborn babies and other children in the family while also providing brochures about the information. As a group, we feel that the intervention was a success. We provided brochures on a variety of topics pertaining to these three substances.

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THE WOMEN'S AND CHILDREN'S ALLIANCE: LIFE SKILLS INTERVENTION ON STRESS AND COPING STRATEGIES

Andrea Griffiths, Kris Lloyd, Alexis Lukoff, Kelly O'Rourke, Brianne Simon, Sharon Snarey, and Julia Szpakiewicz

Our intervention involved working with the Women's and Children's Alliance (WCA) and the women at Serena's House; a thirty minute presentation in a Life Skills group within the WCA. The discussion consisted of two parts: first, recognizing stress and stressors and effects; second, the importance of learning effective ways of coping with stress. We began our workshop by having the women fill out a Susceptibility to Stress (SUS) survey. We lead the discussion into where stress comes from, how individuals perceive stress, its effects on the body and a few tactful ways of coping such as the meditation exercise our group led.

TRIO COMMUNITY BASED HEALTH PROJECT

Alonzo Rivas, Andrea Rivas, Michael Berenger, Leslie Hazen, Matt Locke, and Kim Stephens

This presentation was focused on first-generation college bound students. We focused our presentation on teaching these kids more about Trio, and giving them the information they need to make the right decision about drugs and alcohol. We gave our presentation to a group of teenagers at the Boys and Girls Club. These kids are in a crucial part in their lives, and we wanted to focus on giving them the right information to make proper decisions. We explained how helpful Trio could be along their way through college. We also surveyed these kids on how effective the presentation was. The project was indeed, a success.

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A LOOK BACK AT CONFERENCE 2005





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