Welcome Letter

Dear Students,                                     May 16, 2013

Welcome to an event that is still very new – the third edition of the University of Oregon Undergraduate Symposium. We’re delighted that this year’s symposium continues to celebrate diverse research from many fields of inquiry. We have a total of 98 students participating through 39 posters and 47 talks. The range of questions and ideas that motivate your work is remarkable -- from the way Bornean Orangutans use gestures to communicate, to the influence of the 1946 National School Lunch Act on scientific nutritional standards, to how catalysts may help break down plastics and other polymers.

The Undergraduate Symposium is a perfect opportunity for all of us to share insights and experiences. Once of the wonderful things about creative work is that it brings people together by virtue of their curiosity about similar things or their desire to solve common problems. In addition to showcasing your own work, I hope that the Symposium will help you find new friends – people who will become your partners in the creative adventures you’ve chosen.

Sincerely,

Karen Sprague,
Professor of Biology
Vice Provost for Undergraduate Studies
Table of Contents

Table of Contents ........................................................................................................................................5
Schedule .....................................................................................................................................................8
Venue Map ...............................................................................................................................................7

Session 1 : Oral Presentations ..................................................................................................................10
  Panel : Enhancing Learning
  Panel : Character Creation
  Panel : Technology and Government

Session 2 : Oral Presentations ................................................................................................................15
  Panel: Culture and Education
  Panel: Cultural Expressions
  Panel: Human Environments

Session 3 : Oral Presentations ................................................................................................................22
  Panel: Habitats and Climate
  Panel: Explorations in Chemistry and Water
  Panel: Vertebrate Experession

Poster Presentations .................................................................................................................................27
Sponsors ......................................................................................................................................................39
Index .........................................................................................................................................................40
2012-13 Library Undergraduate Research Awards Competition

The Library Undergraduate Research Awards, sponsored by the UO Libraries, is an annual competitive program honoring UO students who produced outstanding original research and scholarship in the previous calendar year using resources available through the UO Libraries. Cash prizes of up to $1,500 are awarded. For complete information on the program and submission guidelines, visit http://library.uoregon.edu/general/libaward.html.

The Library Undergraduate Research Award winners for papers and projects completed in the 2012 academic year are:

Megan Brogan, “An Environmental Anthropology: The Effects of the Yacyretá Dam on Communities in Misiones, Argentina, in Comparison to the Economic and Environmental Well-being of the Pilcomayo River Basin,” Faculty Sponsor: Ron Mitchell, Political Science

The Sustainable Farms Team: Thomas Keane Daly, Aaron Poplack, Kelsey Kopec, Chelsea Johnson, Miguel Pacheco, Bret Cypel, Meagan Maxon, Amanda Whitcomb, Lauren Ward, “Pollinator Conservation Plan for the Berggren Demonstration Farm” and “Monitoring Bee Pollination Services on Willamette Valley Vaccinium Farms,” Faculty Sponsor: Peg Boulay, Environmental Studies

Jonathan Ng, “Into the Abyss: A Study of American Torture, Power, and Impunity in Iraq,” Faculty Sponsor: Alex Dracoby, History

Phoebe Petersen, “No Man’s Land: A Herstory of Lesbian Intentional Communities in Southern Oregon as a Manifestation of the Pastoral Dream,” Faculty Sponsor: Glenn May, History

Matt Villeneuve, “Management Specialist: The Forgotten Role of Thomas B. Watters in Klamath Termination,” Faculty Sponsor: Glenn May, History
UNIVERSITY SYMPOSIUM SCHEDULE

Thursday, May 16th 2013

9:00-10:30am: Registration, EMU Concourse Lobby

9:00-10:15am: Concurrent Session 1
   Posters Presentations: EMU Concourse & EMU Concourse Lounge
   Oral Presentations: Maple, Oak, Coquille/Metolius Rooms
10:15-10:30am: Break

10:30-11:45am: Concurrent Session 2
   Posters Presentations: EMU Concourse & EMU Concourse Lounge
   Oral Presentations: Maple, Oak, Coquille/Metolius Rooms
11:45am-12:00pm: Break

12:00-1:30pm: Lunch. Keynote by Kimberly Espy RSVP Invitation Only, EMU Ballroom

1:30-1:45pm: Break

1:45-3:00pm: Concurrent Session 3
   Posters Presentations: EMU Concourse & EMU Concourse Lounge
   Oral Presentations: Maple, Oak, and Walnut Rooms

3:00-3:15pm: Break

3:15-4:00pm: Closing Celebration, Distribution of Certificates of Participation by Vice Provost Karen Sprague, EMU Ballroom
Undergraduate Research Symposium
May 16, 2013

- MOVE furniture to accommodate the partitions as shown (I realize this will be difficult. Do your best!)
- Use LARGEST partitions that we have

Power to spaces: 45 and 56

1 table/4 chairs/2 standards closest space next to bottom of stairs

S = Standard
P = Power

For signage
X-Lg Poster
Easels

Client: Undergraduate Studies
Location: Concourse & Lobby
Room: Concourse
Event Name: Undergraduate Research Symposium
Date: May 16, 2013
Time: 9:00-3:00
Prepared By: Scheduling and Event Services
Prepared On: 05/13/13 14:20:08

Diagram created using Room Viewer®.

Venue Map
# Poster Index

<table>
<thead>
<tr>
<th>Last Name</th>
<th>Poster Location Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balu</td>
<td>1</td>
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<tr>
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<td>22</td>
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<td>12</td>
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<td>25</td>
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<td>8</td>
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<td>13</td>
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<td>9</td>
</tr>
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<td>18</td>
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<td>Hathway</td>
<td>39</td>
</tr>
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<td>Howey</td>
<td>11</td>
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<td>21</td>
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<td>31</td>
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<td>28</td>
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<td>Jones</td>
<td>15</td>
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<td>20</td>
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<td>35</td>
</tr>
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<td>Khalifa</td>
<td>16</td>
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<tr>
<td>Larson</td>
<td>23</td>
</tr>
<tr>
<td>Loker</td>
<td>26</td>
</tr>
<tr>
<td>Madison</td>
<td>6</td>
</tr>
<tr>
<td>Marquez</td>
<td>29</td>
</tr>
<tr>
<td>Martini</td>
<td>24</td>
</tr>
<tr>
<td>Mete</td>
<td>3</td>
</tr>
<tr>
<td>Murray</td>
<td>42</td>
</tr>
<tr>
<td>Nathan</td>
<td>7</td>
</tr>
<tr>
<td>Oliveira</td>
<td>36</td>
</tr>
<tr>
<td>Olroyd</td>
<td>30</td>
</tr>
<tr>
<td>Oviedo</td>
<td>40</td>
</tr>
<tr>
<td>Rear</td>
<td>37</td>
</tr>
<tr>
<td>Robins</td>
<td>56</td>
</tr>
<tr>
<td>Sarangam</td>
<td>4</td>
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<tr>
<td>Schachtner</td>
<td>19</td>
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<td>41</td>
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<tr>
<td>Spathas</td>
<td>44</td>
</tr>
<tr>
<td>Tan</td>
<td>38</td>
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<td>Taylor</td>
<td>10</td>
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<td>Walters</td>
<td>27</td>
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2013 Undergraduate Symposium Oral Presentation Panel Schedule

Concurrent Session 1: 9:00-10:15am

Panel A: “Enhancing Learning”  Maple Room

Facilitator: Nedzer Erilus

Presenters:

Chiara Arpaia (Psychology)
Mentor: Marjorie Taylor

“The Effect of Learning to Sew on Self-Esteem, Self-Efficacy, and Optimism in Adolescent Girls”

This study explores the extent that teaching adolescent girls to sew their own clothes works as an intervention to improve self-esteem, optimism and self-efficacy. Twenty-six adolescent girls between the ages of 11 and 16 participated in a sewing class, held once per week for three hours over five weeks. Participants completed questionnaires on self-esteem, optimism, and self-efficacy. Self-esteem and optimism did not show a significant change. However, self-efficacy significantly increased over the five weeks of the sewing course (the Intervention Period) compared with the five weeks before the course (the Control Period). The intervention was run in the same manner as a community sewing class and the sample consisted of a variety of ethnicities, family situations and economic levels. Overall, the significant increase in self-efficacy, the high external validity of the study, the diversity of the sample, and the positive feedback on the course indicate that teaching adolescent girls how to sew in an intervention could potentially increase self-efficacy and, thereby, improve positive development.

Jacob McGrew (Economics, Music)
Mentor: Joe Stone

“United Way of Lane County’s Promise Neighborhoods and the Benefits of Reading Readiness”

In this paper, we measure statistical relationships between defining characteristics of incoming kindergartners and their initial literacy scores. Our analysis focuses on four elementary schools in Oregon’s Springfield School District: two Promise Neighborhood schools and two comparable non-Promise Neighborhood schools. Using scores from the literacy benchmark tests each incoming student takes upon entering kindergarten—controlling for variables such as family income, English language learners, gender, special education, and ethnicity—we find the defining characteristics with the most significant relationships that influence literacy scores. In the absence of a fully randomized experimental design, we give policy suggestions to United Way of Lane County to more effectively increase early literacy in the Lane County, as well as offer advice on the kinds of additional information that would permit a more definitive future study of the Promise Neighborhoods.

Jordan Wilkie (Political Science)
Mentor: Steven Shankman

“Inside-Out Prison Exchange Program: Alumni Facilitation Training for Building Communities”

The Inside-Out Prison Exchange Program is an organization that introduces university courses to carceral institutions across the U.S. and Canada. To date, over 12,000 students have taken part in an Inside-Out class, where Outside (university) students and Inside (incarcerated) students learn as peers. Both inside and outside the walls, alumni have sought to continue their Inside-Out experience and have done so through a number of
programmatic avenues. The purpose of this thesis is to establish a set of foundational documents for an organization that will encourage and direct the growth of alumni activities. It is a first, practical step in the formation of a mutually strengthening and informative organization of inside and outside students into an international Inside-Out Alumni Association. The Inside-Out Program offers college-level courses inside carceral institutions. In the metaphorical comparison where Inside-Out represents university classes, Alumni strive to represent student groups by creating programmatic, “extra-curricular” opportunities that enhance the educational process through skill-building and professional workshops. This thesis consists of three sections: a manifesto detailing the mission and vision of outside alumni, essential policy, training, and resource documents, and a critical research essay. These documents will combine to describe the importance of alumni work, a practical work-product detailing policy and resources for alumni, and a critique of Inside-Out and the subsequent Alumni Association.

**Ellen Ingamells (Environmental Science)**  
**Mentor: Kathryn Lynch**

“For a Citizenry or For a Workforce? The Role of Industry in American Science Education”

It’s no wonder that industry (manufacturing, engineering, product design and research) has been tied to American science education since the birth of this country. Industry accounts for nearly 20% of the American economy, includes the fastest growing occupational fields, and is, by most accounts, what keeps the United States competitive. This project approaches the question “what should the role of industry be in science education?” from four different angles: precedent, policy, practice and opinion. Additionally, there is a larger theoretical question embedded in this project: what is the goal of our education system? In the last 230 years education has changed more because of answers to this question, than from any other factor. Today our education system is trying to create all of the workers that our current industry needs. History shows us that these policies and practices are short sighted. Teaching students to be a part of today’s industry leaves them incapable of adapting to future industry. It is time to break out of this pattern. Regardless of what your goals are for the American education system, they can best be met by creating well rounded, critically thinking innovators. By attempting to inspire passion and ingenuity, our school system can produce a citizenry that is engaged, thoughtful and patriotic, as well as a workforce that is adaptive and innovative in every field.

**Derek Leung (Environmental Studies)**  
**Co-Presenters: Madison DeLong and Kailyn Haskovec**  
**Mentor: Kathryn Lynch**

“Environmental Leadership Program - Environmental Education Adams Elementary”

The Environmental Leadership Program is a two term program for University of Oregon students who work together in groups on different environmental projects ranging from case studies to film production to education outreach. The X.Stream team is a group of ten students who spent winter term creating an environmental education curriculum to teach at Adams Elementary in the spring. Adams students in grades 1st through 5th will learn basic scientific principles of water through exploration of the McKenzie River. The overall theme we’re trying to convey is interconnectivity between the watershed and it’s inhabitants. We hope to cultivate action through spreading awareness and knowledge. We are following Sobel’s framework of connecting with animals in grades 1 and 2, exploring nearby environments in grades 3 and 4 and examining human impacts on the environment in grade 5. Using principles of engaged pedagogy, we hope to utilize activities that engage the students’ mind, body and soul.
Concurrent Session 1: 9:00-10:15am

Panel B: “Character Creation” Oak Room

Facilitator: Matt Nelson

Presenters:

Keaton Kell (International Studies, Romance Languages, Creative Writing)

“Pocahottie” and the “Drunken Indian”: How Narrative Plots Create Danger for Native Americans

The effects of narratives about Native Americans on the role of Native people and how they are viewed and how they view themselves in a modern world have remained relatively unexplored. An analysis of this role will allow us to better examine the violence and oppression faced by Native people in the United States as well as how and why that violence is perpetuated. By examining the representation of Native Americans in media, advertising, Native literature, and the news, I explore how narratives about Native people are created and how this affects both Native and non-people, which in many cases can be damaging and even dangerous to the Native people involved in these narratives. The importance of research on the connection between narratives created by a society and the results of these narratives on the minority they are about is clear. Understanding how people are affected by narratives about them sheds light not only on how we as a society can better protect minorities, but also on how we as a society can evolve past narratives in order to allow people to exist freely outside of those narratives.

Charlotte Rheingold (Comparative Literature, Economics)

Mentor: Susanna Lim

“Consequences of Conduct: A Character Analysis of Anna Karenina”

Although she is no role model to be emulated, readers have been enchanted by the character of Anna Karenina for generations. Her alluring personality and passionate individualism obscure her true nature—that of an adulteress who ultimately abandons her family. For Tolstoy, family represented the most sacred of relationships, yet he too is charmed by Anna despite her violation of his own ideal. How can one of literature’s most well-loved characters also be one of the most selfish and reckless? The answer lies in the fact that her personality abstracts her conduct and makes the reader willing to overlook her self-serving decisions. I will argue that Anna’s conduct is what ultimately leads to her downfall, and not her personality, because the same tendency to flout societal regulations is also seen in the morally upright character, Levin. I will reveal through a series of close readings and secondary sources that Anna’s faults lie in the nature of how she executes her decisions, not the decisions themselves, like having an affair, which Russian high society did not entirely frown upon.

Maggie Witt (English, Art History)

Mentor: Louise Bishop

“Chivalric Devotion and Feminized Power in Elizabethan Portraiture”

Art historians often write off Elizabethan art as a less advanced technical school that suffered from its severed contact with continental Europe after the 1530s. What so few of them stop to examine is the purposeful archaism embedded in the Elizabethan stylistic mode. Rather than attempting to emulate Italian Renaissance naturalism and dramatic shadows, Elizabeth I promoted during her reign an artistic style that reminded the viewer of England’s glorious chivalric past. By presenting herself as both a native English version of the Virgin Queen and the medieval mistress to whom all Elizabethan knights owed allegiance and devotion, Elizabeth reversed the active masculine iconography developed by her father, demonstrating visually the symbiosis of her position as woman and
monarch. In this way, she not only reinforced her political might, but also recreated England medieval iconography in a secular rather than Catholic medium—reinforcing England's independence from European religious influence while simultaneously stressing its artistic singularity. This study examines the commemorative and miniature portraits of Elizabeth I in their historical and artistic contexts in order to demonstrate their use of chivalric modes as visual legitimizations of female royal power.

Eva Bertoglio (Humanities)
Mentor: Matthew Sandler

“Heredity and Generational Cyclity in One Hundred Years of Solitude”

The history of Colombia is fraught with conquest, myth, and patterns of oppression and revolution. Gabriel Garcia Marquez parallels the cycles of Colombian history in his magical realist novel "One Hundred Years of Solitude". The patterns of incest, traits, failures, and names within the Buendia family are representative of the tension between genetic fate and choice that exists universally. Marquez uses repetition to make points about the nature of war, family, and the individual. Brian Conniff's research on science and apocalypse in "One Hundred Years of Solitude" supports these ideas and makes connections in the text with the ideas of societal and scientific progress. The family cannot escape their tragic fate because they cannot break their own self-determined pattern of self destruction.

Concurrent Session 1: 9:00-10:15am

Panel C: “Technology and Government” Coquille/Metolius Rooms

Facilitator: Melina Pastos

Presenters:

Walter James (History)
Mentor: James Mohr


Historians and social scientists of Britain have noted its rapid transition from the Second World War to its modern welfare state. The causal relation between World War II and the British welfare state had been a subject of scholarly debate since the 1950s. After tracing this scholarly discourse, this article shows how the “warfare state” acted as a catalyst in the formation of the postwar “welfare state.” It does this by examining several wartime factors. What were the effects of air raid evacuations and the military episodes in 1939 and 1940 on wartime social policy? How conducive was the war economy to the transition to peacetime welfare state? How did academic and public opinion develop before and during war, and what was the popular and political significance of the Beveridge Report? Answering these questions shows the war and the need to sustain public morale compelled the government to implement several social policies and to make promises of a postwar welfare reform, which in turn helped create a wide agreement among the public and academic circles on the need of a fundamental social reform after the war. The Second World War, in short, played a significant role in enabling the postwar Labour government to establish the British welfare state. The implication of this conclusion is that the first modern welfare state owes its birth in large part to the most destructive war in history.
**Peter McKay (Computer and Information Science)**  
**Mentor: Kevin Butler**

“libPacForge: a Library for Automated Packet Generation in C++”

This paper concerns the automation of arbitrary packet crafting and transmission, in order to test functionality at the transport layer of the internet protocol suite and above. Although libraries such as libpcap exist to make it easy for programmers to carry out network packet analysis, no such library exists specifically to ease the creation of programs that craft and efficiently transmit arbitrary packets (i.e. software testing suites and network protocol prototypes). This paper will detail this author’s creation of such a library, libPacForge, and the results of tests to compare its usability and efficiency against a manually crafted packet generator in C, as well as against a program created using the Metasploit Framework. These tests measured efficiency by comparing transmission rate of rapidly changing packets, and measured usability by analyzing the time necessary to write a functional program. In the course of carrying out these tests, a marked increase was observed in terms of both efficiency and usability. From this we can deduce that automation can reduce the time needed to write effective tests and prototypes.

**Man Nguyen (Economics)**  
**Co-Presenters: Eric Wittkop and Emily White**  
**Mentor: Joe Stone**

“ALICE (Asset Limited, Income Constrained, Employed) Population in Lane County- A Project with United Way of Lane County”

Many US households earn an income greater than that specified by the Federal Poverty Level (FPL), a measure of poverty that does not vary across the 48 contiguous states, however, many households in the U.S who stand above the FPL still struggle to meet their basic needs and be financially self-sufficient. Although the FPL does not take into account the actual quantity of money required to meet the basic cost of living expenses across the United States, many financial assistance programs are designed solely to assist people below this line, especially federally administered programs. As there exists a percentage of population who stands above the 100% FPL but still not able to be self-sufficient, it is the ALICE (Asset Limited, Income Constrained, Employed) population. We are working on the research with United Way of Lane County who seeks a way to calculate the percentage population of ALICE and its distribution in Lane County. It is important to know the ALICE population as ALICEs has been suffering without sufficient income that will lead to a short and long-term suffering to the whole community. Our methodology is focused on meeting two separate objectives. The first objective is to calculate the number and percentage of ALICE population in Lane County. The second objective is to create a predictive model that will give United Way a tool to estimate future fluctuations in the size (but not the distribution) of the Lane County ALICE population so that they can better direct their programming to serve this group.

**Jacob Valleau (Political Science)**  
**Mentor: Joseph Deckert**

“Solyndra as a Symptom of Regulatory Capture”

Conservatives cite the failure of a stimulus package loan to the (now-defunct) solar company Solyndra as one of president Obama’s administrative failures. The quality of regulation of the funds appropriated from the American Recovery and Reinvestment Act of 2009 is still up for debate. Solyndra LLC’s bankruptcy is a symptom of pervasive regulatory capture during the 2009 economic stimulus package. My research will explore the relationship between these allegations of administrative mishandling (command and control policy, rushed loans, and crony capitalism), and the phenomenon known as regulatory capture. In regulatory capture theory, government oversight favors industry insiders over free market principle of competition. My analysis shows that Solyndra’s subsidization was mishandled. The subsidization of the multiple sectors of the industry has to be carefully crafted in order to guarantee global market share for the United States. In Paul Boudreaux’s ”Carrots and Sticks from Obama’s Solyndra and Beyond”, the law professor claims that regulatory failures created Solyndra’s...
bankruptcy. I respond by arguing that the failure of Solyndra is a broader sign of regulatory capture during the appropriation of funds from the American Recovery and Reinvestment Act of 2009.

Carl Windrup (Political Science, Philosophy)
Mentor: Alison Gash
“A Healthy Doctrine – Examining Sebelius's Effects on Congressional Regulatory Powers”

This project examines the effects of the Supreme Court’s ruling in NFIB v. Sebelius on the Commerce and Taxing and Spending Clause doctrines. The goals of this thesis are twofold. First, it seeks to parse out the details and ambiguities surrounding the decision in Sebelius, and show how this fits with the doctrinal history of the Commerce Clause. To this end I have devised a new framework for thematically arranging the Court’s vast Commerce Clause case history. Through this new framework, I am able to show that the case marks a return to the Obstructionist pre-1937 Court jurisprudence. This novel thematic analysis is the main significance of this paper, and my main contribution to the field of political science. Secondly, this paper has shown that Sebelius not only limits the scope of Congress's commerce power, but also how Chief Justice Roberts, through a very deft move, also limited the scope of the Government's taxing power. Specifically, by appeasing the opposing side with a victory in the short-term, Roberts has forced Congress to turn to its taxing power for major legislations dealing with economic regulation. Given the hostile political climate around taxation, this move will come to limit this power in the long-term. Importantly, the inquiry in this paper is not merely an intellectual exercise. There are real political implications at stake in this discussion of Sebelius's effects on Congress's commerce and taxing powers. The case directly effects congressional proceedings, and thus, the political process.

Josephine Woolington (Journalism, Political Science)
Mentor: Kyu Ho Youm

“Big Brother is Watching: Government Surveillance v. Right of Privacy”

The U.S. government in the past two decades increased its ability to access personal online information. Often, government accesses online information without a search warrant or proper court order due to archaic federal privacy laws, sweeping surveillance laws and the third-party doctrine of the Fourth Amendment to the U.S. Constitution. My research examines how the Fourth Amendment’s prohibition of unreasonable searches and seizures applies to cyberspace. Outdated federal privacy laws allow law enforcement in the digital era to access revealing and sometimes incriminating information about people through Facebook, Twitter, email and Internet searches. Federal privacy laws and court decisions have been slow to apply Fourth Amendment protections to cyberspace, threatening the fundamental right of privacy. My research focuses on three federal laws: the Electronic Communications Privacy Act of 1986, the USA PATRIOT Act of 2001 and the Foreign Intelligence Surveillance Act. Each law gives law enforcement power to access online information. I also examine the third-party doctrine that allows law enforcement to access information posted to a third-party, such as Facebook, without a warrant or court order. Several members of Congress attempted to update privacy laws last year, but failed. Online privacy rights are not prioritized in Congress because little is known about the archaic laws and doctrines. My research helps inform Internet users about fundamental privacy rights in cyberspace.

Concurrent Session 2: 10:30-11:45am
Panel A: “Culture and Education”  Maple Room

Facilitator: Nedzer Erilus

Presenters:
Leanna Carollo (Education, Sociology)
Mentor: Juliet Baxter

“Beyond Elementary: Examining Conceptual Demands of Division of Fractions in Current US Curricula”

The Common Core State Standards of Mathematics (CCSSM), a set of US educational standards which were initially adopted in 2010 by 45 states, creates a more rigorous and coherent set of standards for American students, making elementary math anything but elementary. The adoption of these new standards formulates the research questions for this study: How well do current curricula match the CCSSM and how well do current curricula support teacher knowledge to implement the standards? Three evaluation tools helped to analyze division of fractions in three diverse curricula used in the United States: Prentice Hall, Singapore Math, and CK-12. These tools measure (a) the cognitive demands of the mathematical tasks in each curricula, (b) the mathematical coherency of an instructional unit, and (c) the resources in each curricula that support teachers’ understanding of mathematics. I find that Singapore Math’s problems reach higher-level cognitive demands more often than Prentice Hall and CK-12. Prentice Hall and CK-12’s reliance on using the standard division algorithm inhibits conceptual thinking for both students and teachers. From a Curriculum Review Tool, which focuses on teacher knowledge, I find that Singapore Math is the closest to reach the division of fraction CCSSM compared to Prentice Hall and CK-12. Resource tools for teachers can be developed that better support students’ learning by combining characteristics from each curriculum such as word problems, manipulatives/pictures, and samples of students’ work.

Xiaoying Chen (Sociology)
Mentor: Ryan Light

“Cultural Differences in Student Perceptions: Student Evaluations of Online Discussion Forums”

Cultural diversity and technical development have changed students’ learning experiences in American higher education. This research explores the relationship between cultural influences on students’ perceptions of higher education and students’ evaluations of their experiences with the use of online discussion forums in college. By employing both survey and interview, this case study on Asian international students and American students at University of Oregon examines three aspects of student evaluations: their expectation of the instructor’s role, self-evaluation of their own participation, and overall evaluation of their online discussion forum experiences. The results indicate that compared with American students, Asian international students tend to expect less in terms of the instructor’s role and provide lower self-evaluations of their own participation in online discussion forums. Meanwhile, both American students and Asian international students have positive evaluations of their online discussion forum experiences. The findings suggest that college administrators and instructors should take cultural orientation into account to promote a diverse and understanding learning environment in future course design.

Piper Arnold (Psychology)
Mentor: Marjorie Taylor

“The Effects of Screen-Based Media on Young Children’s Social Understanding Skills”

Screen media is now a pervasive part of children’s lives, but little is known about its effects on young children’s developing social understanding skills. The goal of this study was to examine the association between frequency of screen media use and social understanding skills in children ages 4- to 6-years-old. Using a computerized questionnaire, parents (n = 50) reported on their children’s general media use, media use on a typical day, media culture in the household, and their social understanding skills. No relationship was found between the frequency of general media use and social understanding skills or between total screen time on a typical day and social understanding skills. However, there was a significant negative association between television culture in the household and children’s social understanding skills. This finding is consistent with previous research indicating that household media practices have the potential to influence early developmental processes.

Phoebe Petersen (History)
Mentor: Ellen Herman

The text of the 1946 National School Lunch Act (NSLA) asserts three central reasons for enacting National School Lunch Program (NSLP): it was “a measure of national security, to safeguard the health and well-being of the Nation’s children and to encourage the domestic consumption of nutritious agricultural commodities and other food”. Rooted in twentieth century ideas about the rights of childhood and the government’s interest in protecting children for national security, the implementation of scientific nutrition standards, which also developed around the turn of the twentieth century, was the means through which the United States Department of Agriculture (USDA) set out to use the NSLP to protect children. An analysis of the evolving nutrition standards set out in twentieth century USDA food guides for all Americans in conjunction with the primarily static NSLP food standards provides evidence of the rigor with which the USDA pursued its goal of using scientific nutrition to protect children. By tracing the evolution and implementation of scientific nutrition in the NSLP through USDA documents and other public accounts, it becomes clear that despite placing agriculture, the protection of children, and national security as equals, the NSLP has shown overwhelming loyalty to agriculture at the expense of children’s health.

Inga Suneson (Planning, Public Policy and Management)
Mentor: Richard Margerum

“The Road to a Smoke and Tobacco Free Campus: A Case Study of the University of Oregon”

Many college campus environments have changed dramatically in the past ten years. Prior to 2003, the smoke free campus did not exist. Before 1999, such an idea had never been seriously considered. As of November 2012, there were over 700 colleges and universities with some sort of smoke free policy, and 209 that are entirely smoke and tobacco free. Such a rapid and dramatic policy shift needs exploration. As it stands, there are very few studies of these university policy changes. At this point, it could be very beneficial for future institutions to have an understanding of general best practices, as well as the many possible issues and stakeholders involved in making a decision to become smoke free and then implementing that decision. For this reason, I have chosen to ask the questions: What are the processes, approaches, and barriers to successful policy creation and implementation that ultimately contribute to a smoke free environment?

Lindsay Thane (Political Science)
Mentor: Dan Tichenor

“Freedom from Guantánamo: How the Court Curtailed Prerogative Powers and increased Civil Liberties for Detainees”

During the post 9/11 era the President made claims to expansive Commander-in-Chief Powers, yet the United States’ functioning as a constitutional democracy necessitates a sharing of power among all three branches. Executive claims to prerogative powers were scrutinized by the Court for disregarding civil liberties, most noticeably those of the detainees at Guantánamo Bay. The Court’s unprecedented step to place checks on Executive power led to this inquiry of whether the Court’s post 9/11 decisions curtailed unilateral Executive policy making and safeguarded the civil liberties afforded to detainees at Guantánamo Bay? This study looked at the Court’s decisions in the terror cases and analyzed their effect on Executive policies, as well as Congress’ activeness in shaping detainee policy and placing checks on the Bush Administration’s prerogative powers. Traditionally, the Supreme Court has deferred to the President in times of war; however, following 9/11 the Court took an active role in placing limits on the President’s unilateral powers. The Court’s decisions in these cases were effective in restraining Executive power, but they only somewhat protected and restored the detainees’ civil liberties. The protection of certain individual rights has been followed by the curtailment of others. Currently, the Obama Administration is facing criticism for the indefinite detention of detainees, and this study provides a framework which outlines how civil liberties can again begin to be restored.
Is Dance Dance Revolution (Konami, 1998) the true dance game for the masses? Ever since its arcade release in Japan, the game has sparked a cultural phenomenon not just in its home country, but also throughout the world within the following years. Numerous spin-offs and rival dance games have been offered up to this day, but Dance Dance Revolution has remained one of the most popular dance games around the world. The success can be attributed to many factors, but it is ultimately the result of the players themselves as part of a growing dance culture that embodies much more than what the game offers on the surface. I will first examine the core gameplay as, while it looks deceptively simple at first, it is as infinitely complex as the practice of dance itself. Then I will briefly look at the history of the game through its music offerings, from the inclusion of Western dance music when it was first released to the recent inclusion of J-pop and anime songs, and how players interact with such music. Finally, I will argue for music arcade games as a form of public art and expression as they create a kind of intrinsic connection between the player, the gameplay, the music, and the social space that arcades provide. In addition, with the use of both popular music and original, diverse music made specifically for the game, there will surely be at least one song that anyone will like and be able to dance. The result is a series that continues to captivate players and that Konami continues to support even today.

Sarah Shindelman (Spanish)
Mentor: David Wacks

“Las excelencias de los Hebreos: A Translation of Isaac Cardoso’s Seventeenth-Century Jewish Apologetic Treatise”

The project presents a critical translation of a seventeenth-century Jewish apologetic. The author of the apology, Isaac Cardoso, emigrated from Catholic Spain to the Verona Ghetto in order to convert to his ancestral religion, Judaism. His work, the “Excelencias,” represents the culmination of his spiritual and physical journey to identify his place in society, and he wrote the “Excelencias” to help other conversos like him make the difficult transition from Christianity to Judaism. As an apology, the work attempts to explain Judaism from a Jew’s point of view to non-Jews, namely Christians. The project consists of an introduction giving a short biography of Cardoso, an analysis of the “Excelencias,” a comparison to three other prominent Jewish apologists of the seventeenth century, and a comparison between the Verona ghetto and the Jewish community in Amsterdam (where the text was printed), afterwards follows a translation with supplementary footnotes of the first two chapters of the “Excelencias:” ‘A People Chosen by God’ and ‘One People.’

Jonathan Weiland (Political Science, Economics)
Mentor: David Steinberg

“Clientelism as Compensation: How Clientelism facilitates Capital Account Liberalization in Latin America”

The general embrace of liberal economic policies throughout the developing world has been noteworthy for its social and political implications. The purpose of this paper is to explore the political dynamics of capital account liberalization (i.e. the free movement of capital across countries) in Latin America since the 1980s. In particular, I
study how policymakers were able to enact economic policies like capital openness that imposed severe costs on certain domestic actors. I theorized that the ability of policymakers to compensate those actors hurt by capital openness could help explain the lack of resistance to such policies. The results of a case study of Argentina’s capital account liberalization in the early 1990s and an empirical analysis of 19 Latin American countries give support to this hypothesis. Hence, the analysis conducted in this study has given strong reason to pursue additional research on the relationship between informal interactions among policymakers and citizens (like compensation) and the likelihood of economic reforms throughout the developing world.

**Meredith Comnes (Spanish and Geography)**
**Mentor: Lise Nelson**

“Moroccan Immigration in Spain: A Discourse Analysis of Anti-Immigrant Sentiments from the El Ejido Riots”

On February 5, 2000, El Ejido, Spain, a small town on the Southern Mediterranean coast, erupted in violent conflict with a large riot by local Spanish nationals towards Moroccan immigrants. This riot represents a major explosion of tension between Spanish nationals and Moroccan immigrants that had been escalating since the early 1990s. By completing a discourse analysis of major themes of Spanish media sources, the El Ejido riots show that anti-immigrant discussions evolved in this brief time period. Spanish rioters defined Moroccan immigrants as the “other,” which strengthened Spanish national identity and excluded Moroccans and other immigrant nationalities from peaceful coexistence in Spain. Within the context of Spanish immigration legislation at that time, the discourses surrounding the El Ejido riots show that integration of immigrant groups into civil society is essential to prevent future large-scale ethnic conflicts.

**Sarah Frey-Wyer (Anthropology)**
**Mentor: Lamia Karim**


Focusing primarily on Eugene, Oregon, I have created an overview via participant observation of how people use the communal space within a coffee house and use the historic position of coffee houses in London, England as a basis for comparison. How did people use the space of a coffee house in the 17th and 18th centuries in London, and how does that compare to how people use this “third place” (neither home nor work) in Eugene, Oregon today? This project also explores the evolution of coffee culture in the United States and how coffee has become both gourmet and a cultural commodity in the present-day, primarily considering the growth of Starbucks. Extensive research was done on coffee houses in London spanning three centuries (from the mid-1500s onward). Research in Eugene was completed via participant observation, where I went to several local cafes and spent hours observing how people interacted within them. The outcome of this research shows that people make an effort to privatize space while they are in public, communal areas. With the backdrop of historic London’s coffee houses, I compare the two environments and have found gaping differences in the function of a café. This body of work has value because coffee houses are a dominant “third space” in the world today, and how we use them and interact within them is an important facet of our cultural environment.

**Youngju Park (Linguistics)**
**Mentor: Patricia Pashby**

“Korean Honorifics and American Politeness”

What acts of politeness do you, the reader, expect to encounter throughout your day? Perhaps someone slows down for you while merging onto the highway, or a door is held open for you while entering a building. What polite speech acts do you expect to encounter? Is this a more difficult question to answer? The Korean language consists of a complex honorific system that requires that the speaker manipulate grammar and vocabulary according to the listener’s status, age, and title to a higher extent than in American English. This project serves to
native English speakers who are studying Korean as a second or third language. This project goes further to make a larger claim for the importance of studying a foreign language because of the experience of relativity one can gain.

Concurrent Session 2: 10:30-11:45am

Panel C: “Human Environments” Coquille/Metolius Rooms

Facilitator: Matt Nelson

Presenters:

Brenda Barrett-Rivera (Family and Human Services)
Mentor: Lauren Lindstrom

“Parenting in Poverty: The Experiences of Fathers Who are Homeless”

Fathers who are homeless face unique barriers in parenting. This qualitative study used semi-structured interviews to explore the experiences of fathers who are homeless in a Pacific Northwest city. Data were collected through in-depth interviews with four homeless fathers and staff members from a family shelter. Issues raised through the interviews included: (a) changes to the fathers’ relationships with children and others, (b) stress related to a lack of resources available to homeless fathers, and (c) the impact on the experience of parenting while homeless arising from external perceptions of fathers as primary caregivers and providers. By giving voice to this underrepresented segment of the population, this study provides information that may improve the delivery of services to homeless families.

Claire Phillips (History)
Mentor: Julie Hessler

“Praying for Freedom: Catholic Underground Resistance in Soviet Lithuania”

Lithuania, a small, Catholic nation in the Baltic region, has a long history of struggling for independence from greater nation powers. However, never was that struggle greater than during the period of Soviet control over the nation from 1944—1990. At the beginning of Soviet control, Lithuanians attempted to use guerrilla warfare against Soviet power, but were unsuccessful, and they soon switched over to passive resistance instead. An underground journal known as the Chronicle of the Catholic Church in Lithuania emerged in the 1970’s as a powerful force of this passive resistance in Lithuania. The journal’s original mission was to call for greater religious freedom for Soviet Lithuania, but the journal later grew to encompass a greater mission of liberating Lithuania. This project analyzes the shifting messages of this important journal, and its role in the greater movement for Lithuanian freedom. In reading the text of the Chronicle and by comparing it to the analysis of Lithuanian and Soviet scholars, it is clear that the Chronicle played a pivotal role in the Lithuanian national movement of the 1970’s and 1980’s. The journal unified religious and non-religious Lithuanians in resistance against Soviet power, and kept the flame of resistance alive in a period when active resistance was dangerous and nearly impossible. Though the Chronicle was not explicitly involved in the liberation of Lithuania from the Soviet Union in 1990, it played a large role in ensuring the survival of dissent and resistance in the nation.

Zeph Schafer (History, Economics)
Mentor: James Mohr
“A Hard Problem to Handle’; Sewage in New York Harbor and the Fight Against the Passaic Valley Sewerage Commission”

From 1905 to 1921, the states of New York and New Jersey fought over New Jersey’s right to build a modern sewage treatment facility close to the border between the two states. In New York, concerned state officials claimed that New Jersey’s sewage would overwhelm the already polluted New York harbor, while New Jersey contended that its modern treatment technology would make its sewage disposal unnoticeable. This research used official state and city documents, court records and contemporary newspaper reports to investigate the legal fight between the states. In conclusion, the research reveals how the interstate fight did not defend the public health at stake. Instead, the battle ignored the need to relieve New Yorkers of the sewage from their own city and postponed the introduction of an effective sewage treatment project in New Jersey by almost twenty years.

Emily Smietana (Architecture)
Co-Presenters: Vesta Tsao and Yana Stannik
Mentor: Alison Kwok

“Thermal Comfort Study of Deady Hall; Discovering the Thermal Conditions Inside the Building, Determining Causes, and Suggesting Solutions”

Deady Hall, the oldest building at the University of Oregon, has been determined to be thermally uncomfortable. The radiant heating system is dysfunctional at maintaining a comfortable thermal interior environment as determined by ASHREA Standard 55. This is largely because the heaters have no (or a very poor) zoning system and the building lacks sufficient ventilation. This case study looks at the building’s thermal conditions, assessing the temperature differences across rooms and floors and the influential factors. Using HOBO U12 temperature data loggers, spot checks for relative humidity and temperature, interviews and surveys, we gathered information to build a thermal map of the building during winter months. We have determined that the classrooms on all three main floors of Deady Hall fall within the comfort zone an average of 42.3% of the week. A list of possibilities for addressing these thermal issues has been assembled, with energy conservation being a strong factor. This study is a launching point for further exploration; we hope that it will influence changes to the building that would make a positive difference to users and energy use.

Anna Tomlinson (English)
Mentor: Danny Anderson

“Nostalgia for Childhood & Its Importance to Adult Identity: A Creative Poetry Project”

As psychologists suggest, the process of nostalgia provides exploration of self and continuity of identity. This project investigates how nostalgia for childhood, and particularly remembrances that address the line between innocence and adulthood, remain in society’s consciousness and play an important part in individuals’ identity. Our modern conception of childhood and nostalgia arose in the nineteenth century when the industrial revolution halved infant mortality and children became increasingly valued as individuals. Around 1800, William Wordsworth wrote his foundational poetry that longs for childhood as a time of lost innocence and connection to the divine. The twentieth century poets Donald Justice, Elizabeth Bishop, Anthony Hecht, Seamus Heaney, and Andrew Hudgins continue this exploration of childhood, memory, and nostalgia, building upon and rebelling against Wordsworth’s foundation. Like Wordsworth, Heaney finds childhood wonder in natural landscapes, but also addresses decay and loss of innocence. Justice returns to nostalgia that longs to find belonging in memories but realizes this impossibility. Bishop details childhood confusion and fear when confronting adult realities. Hecht represents memory as nightmarish, as a darkness the speaker can never quite forget. And finally, Hudgins portrays childhood as a vulnerable, humiliating time and longs for adulthood and its allowances of power and pleasure. My own poems strive to enter these poets’ conversation about how childhood memory figures in adult life.

Sachiko Slomoff (Geography)
Mentor: Ernesto Martinez

21
“Reframing the Human: An Introduction to the Human Geography of the Posthuman or Cyborg”

In our current digital age, there has been a significant focus on how globalizing technologies are changing the spaces we live in, but as individuals living in the technologically-mediated landscape, are not we too similarly affected? What is the human impact? After spending some time in a Siberian prison, Dostoyevsky posited the human is the creature that can adapt to anything. Although the electronic age is not a prison in the same regard, how are humans then, adapting to the digitally restructured environment? In this thesis, I present a human geography of the posthuman, humans with an intimate relationship to the rearranged temporal, spatial, and corporal dimensions of technology. Over time, the human species has technologically altered itself so drastically that a new anthropological understanding of what it means to be human is necessary. Whether we are gradually becoming a hybrid of man and machine - an entanglement of genetics and design, and turning into what some theorists call posthumans or cyborgs, are questions I probe to clarify what the new framing of “human” will necessitate. Reframing the human as intimately integrated with technology will have direct influence on people of many spheres because to reframe the human is not an isolated process, it is a creative work that embodies how technology is a temporally, spatially, and corporeally intimate experience in the new digital age that is restructuring the very pillars of the human experience.

**Concurrent Session 3: 1:45-3:00pm**

**Panel A: “Habitats and Climate” Maple Room**

**Facilitator:** Drew Terhune

**Presenters:**

Brooke Bilyeu (Environmental Studies)
Co-Presenter: Everett Baker
Mentor: Peg Boulay

“Evaluating Oregon White Oak Habitat Restoration Projects in the South Eugene Ridgeline”

Over the past 150 years, fire suppression techniques and the encroachment of conifer forests have drastically reduced the area of historic Oregon white oak (Quercus garryana) savanna. Recent restoration efforts have focused on removal of coniferous species to promote oak vigor and growth. Working with the City of Eugene as part of the Environmental Leadership Program, the goals of our study are to evaluate the success of past restoration project’s attempts to improve Oregon white oak canopy. We will do this through post-management monitoring as well as conducting baseline monitoring studies on oak savanna habitat along the South Eugene Ridgeline. We are re-visiting three study sites from 2010 monitoring efforts and completing tree inventory surveys for two sites newly acquired by the City of Eugene, as well as monitoring heritage trees, analyzing understory habitat, and attempting to ground-truth the City of Eugene’s GIS layers by using the latest GPS technology. With the implementation of this effectiveness monitoring, we hope to show that oak canopy release is a valid method for oak savannah habitat restoration, and provide baseline data for future oak release management and monitoring efforts.

Robert McNulty (Biology)
Mentor: Valerie Brown

“Marine Mammal Monitoring on Guam”
Data on marine mammals, specifically information on their stock numbers, seasonal migrations, population structure, habitat use, and behaviors is limited. This study of island associated resident pods of the long nosed spinner dolphin (Stenella longirostris) was conducted near the island of Guam, part of the Mariana Archipelago, south of Japan. These spinner dolphins may be negatively impacted by an increased United States military presence on Guam which leads to expanded training activity, population growth, coastal development and associated tourism. This study compiles historical and current data on marine mammal sightings and behaviors to study possible impact of US military presence. The long nosed spinner dolphins (S. longirostris) are of particular interest because of their proximity to shorelines, their habitat use, and their daily activity schedule. Current data was collected from interviews and sighting events. Standard photo documentation and field survey protocols developed by the National Marine Fisheries Service (NMFS) Pacific Islands Fisheries Science Center (PIFSC) were used. This study created a preliminary marine mammal database for Guam and has expanded the limited information available. In addition, sighting information was used along with geographical information system (GIS) software to combine NOAA benthic habitat maps with multibeam bathymetry to gain a better understanding of the habitats occupied by documented species. Preliminary results suggest that S. longirostris populations in Guam have similar circadian and seasonal rhythms as Hawaiian S. longirostris populations. The results also demonstrate that Guam spinner dolphins show a preference for clear, relatively shallow open water bays with underlying, unconsolidated sediment (sandy bottoms). An increase in military use of shallow bays and dolphin-associated ecotourism could therefore negatively impact resident populations of the Guam spinner dolphins.

Jessica Scott (Environmental Science)
Co-Presenter: Wayland Huynh
Mentor: Peg Boulay

“Delta Ponds Riparian Restoration Assessment”

Wetlands play an important part in the provision of ecosystem services; they improve drinking water by filtering out various pollutants, can serve as temporary storage basins for rain and snowmelt, as well as reduce the amount of destruction that result from severe flooding. They also create temporary and permanent habitat for a variety of both endemic and endangered species. Located in Eugene, Delta Ponds is a 150-acre waterway site owned by the City of Eugene that borders the Willamette River. Once owned by Eugene Sand and Gravel, the site was largely unmanaged until restoration efforts began in 2004 and continued into 2012. One of the main objectives during that time was to improve in-stream and riparian habitat for a variety of species. Members of the Wetland Research team collected data on restored habitat of Western Pond Turtles, Northwestern Salamanders, Northern Pacific Chorus Frogs and various other species. We also monitored the growth and vigor of various riparian plantings. This data shows the results of previous restoration efforts, and will inform where improvements may be needed in the future. It will be an important aspect of assisting the City in the prioritization of management resources and can serve as a baseline for future restoration efforts.

Ashley Sosa (Environmental Science)
Co-Presenters: Breanna Senate and Matt Keeler
Mentor: Peg Boulay

“Establishing Baseline Data for Aquatic Habitat Restoration and Evaluating Riparian Planting Success in the McKenzie Watershed”

Salmon are valued not only as food and symbol, but as bioindicators of broad ecological functions related to aquatic systems. Countless projects across the Pacific Northwest focus on creating quality habitat and connectivity for salmonids and other aquatic species. Thus, pre and post project monitoring of stream restoration techniques such as large woody debris placement and riparian plantings provides crucial information on the success and validity of current techniques. We are partnering with the McKenzie Watershed Council and the US Forest Service at two sites of active restoration in the McKenzie Watershed. At the Berggren Watershed Conservation Area we conducted riparian vegetation effectiveness monitoring as well as in-stream baseline monitoring. At Cougar Creek we conducted in-stream baseline monitoring as well as snorkel surveys for fish inventory. The results of our in-
stream monitoring will allow for quantifiable measurements of change in stream channel morphology and substrate due to restoration activities. Snorkel survey data will inform future efforts with site specific data on fish presence and demographics. Results of vegetation monitoring will guide future riparian vegetation plantings. This research will give our community partners valuable information to improve future restoration of aquatic habitat.

**Kelsey Ward (Environmental Science)**
**Mentor: Mark Carey**


The language of the Organic Act of 1916 explicitly defines the national park mission: “to conserve...scenery and the natural and historic objects and the wild life therein...as will leave them unimpaired for the enjoyment of future generations.” As the world around national parks changes, unimpairment is increasingly difficult, bordering on impossible. Climate change is conceptualized as an “unprecedented challenge” for park managers because of technical/scientific uncertainty. It has the potential to reshape our understanding of the National Park System as well as the national park idea. In the face of large and diverse uncertainties, thus far the National Park Service has taken a “safe-to-fail” approach to management, which emphasizes neither ensuring success nor avoiding failure in adaptation and mitigation. Through analysis of management documents, observation, and interviews this paper illustrates how science, education, and management within parks has evolved as a result of climate change. I argue that though climate change presents a challenge, it also is creating positive new ideas about national parks, including the view of these protected areas as vital cores of much larger ecosystems, and the emerging idea of national parks assuming a more prominent role in public education. While climate change threatens the “natural state” of national parks as set in the Organic Act, it also provides a unique opportunity to re-emphasize the multiple values of protected areas.

**Concurrent Session 3: 1:45-3:00pm**

**Panel B: “Vertebrate Expression”  Walnut Room**

**Facilitator: Chris Moe**

**Presenters:**

Brianna McHorse (Biology)
**Mentor: Samantha Hopkins**

“Hidden Information in the Fossil Record: Using Discriminant Analysis on Isolated Postcrania”

Postcrania (non-skin or teeth bones) are often preserved in the fossil record but, unless found with teeth or skulls, are rarely identified beyond the family level. As a result, they offer a potentially untapped resource for studies of extinct diversity. Discriminant statistical analyses of linear measurements on these postcranial bones show remarkably high identification success rates for many mammal types, including antilocaprids (pronghorn), camelids (camels and llamas), and equids (horses). The approach we use is ideal, as it captures more subtle bone-shape variation than examining scatterplots of measurements but is more straightforward than three-dimensional morphometric methods. Further, applying Bayesian methods to the established discriminant analysis can allow integration of multiple skeletal elements, e.g., phalanges (fingers), astragali (ankles), and metapodials (hand and foot bones). We test this new method on a known, artificially created assemblage of modern cervid (deer), camelid, and antilocaprid postcranial bones. In a mixed training set of four bone types, we achieved identification...
success rates ranging from 87.5% to 100%. Our method is simple but has the potential to quickly and significantly improve knowledge of the hoofed mammal ecology at several postcrania-rich fossil sites. We focus on hoofed mammals, but the method should transfer well to other mammalian groups, shedding light on hidden diversity and improving any studies that rely on identification.

Becca Cudmore (Anthropology)
Mentor: Kirstin Sterner

“The Flexibility of Gestural Communication in Bornean Orangutans (Pongo pygmaeus) in Kalimantan Tengah”

Great ape communication research attempts to reveal the cognitive abilities of our closest living relatives and to inform our understanding of the evolution of human language. Although great ape gestural communication has been well documented, relatively few studies are specific to the orangutan. The aim of this study was to determine if rehabilitant orangutans (Pongo pygmaeus) at the Orangutan Care Center and Quarantine (Pasir Panjang, Indonesian Borneo) use distinct gestures toward other orangutans versus toward humans. Because orangutans are tree-living species whose arms are typically not free to gesture, we predicted that orangutan gestures are adapted to employ the whole body. Using 59 sub-adults in 18 different home enclosures, we examined gestural types and frequencies in comparisons of orangutan-orangutan and orangutan-human communication. Orangutan-human trials were run with both the experimenter facing and non-facing to further measure gestural flexibility. Our results show that 92% of orangutan-human gestures were made with the limbs, while the majority (46%) of orangutan-orangutan gestures were facial. When the human experimenter was facing, 76% of gestures were visual, while when non-facing, only 7% were visual. Our results suggest that limb gesturing toward the experimenter may be partly due to rehabilitant orangutans learning that caretakers respond more readily to anthropocentric gestures, like arm/hand pointing. Our findings demonstrate that these orangutans use gestures flexibly.

Alan Gomez (Biology)
Mentor: Kryn Stankunas

“Opposing Roles of Wnt and BMP signaling in Zebrafish caudal fin regeneration”

Zebrafish and many other vertebrates possess an incredible ability to regenerate damaged or amputated body parts including the retina, spinal chord, fins and limbs. The zebrafish caudal fin is a widely studied system because of its simple anatomy, accessibility, and robust ability to completely and consistently regenerate after amputation in under two weeks. Regeneration of the zebrafish caudal fin is dependent upon the formation of a proliferating mass of cells that grow at the amputation site called the blastema. The cells that line the bone rays in the mature zebrafish contribute to the blastema along with other cell types and are responsible for rebuilding the lost bone. These osteoblasts become activated after a fin injury through dramatic changes in their genetic program. Two signaling pathways called Wnt and BMP are particularly important for inducing these genetic changes and for organizing the spatial localization of osteoblasts in the blastema. BMP and Wnt are proteins that cause changes in gene expression programs of the cells that they physically interact with at the cell surface. Proper expression of Wnt and BMP in the blastema is essential for regeneration to occur. By examining the genes activated by Wnt and BMP during regeneration we have concluded that the gene expression programs activated by BMP work to counteract those of Wnt signaling. Investigating this feedback between BMP and Wnt has helped to characterize the specific roles that these signaling pathways play during the process of bone regeneration.

Clare Chisholm (Environmental Science)
Mentor: Kelly Sutherland

“Prey detection and feeding success of the comb jelly Mnemiopsis leidyi on the copepod Acartia tonsa in still and turbulent waters”

The comb jelly or ctenophore, Mnemiopsis leidyi, is a voracious predator in both its native and non-native habitats. Though M. leidyi inhabits coastal waters that are frequently turbulent, previous feeding studies have been
conducted in still water tanks. This study aimed to research their feeding behaviors in turbulent waters, which is more representative of their natural environment. Interactions between the free-swimming ctenophores and copepod prey (Acartia tonsa) were observed and recorded (n = 73) in a laboratory turbulence tank. Turbulence was created using submersible speakers, and the interactions were recorded using a video camera. Capture efficiency denoted interactions containing direct contact between copepods and M. leidyi that led to eventual capture, frequently after multiple interspecies contacts. Overall copepod capture efficiency was similar in still (48%) and turbulent (43%) water, as were the overall prey retention rates for each (still = 26%; turbulent = 20%). However, M. leidyi exhibited anticipatory responses, defined as altering the position of feeding structures, nearly twice as often in still (41%) waters than in turbulent (20%) waters. The hydromechanical “noise” produced by background turbulence may inhibit the capacity of the ctenophore to detect and respond to fluid motions produced by its prey.
Concurrent Session 3: 1:45-3:00pm  
Panel C: “Explorations in Chemistry and Water” Oak Room

Facilitator: Sheri Donahoe

Presenters:

Gregory Harlow (Chemistry)
Mentor: Shih-Yuan Liu

“Thermodynamically Controlled, Dynamic Binding of Polyols to a 1,2-BN Cyclohexane Derivative”

The high affinity, selective binding of polyols to a benzylated 1,2-BN cyclohexane derivative is introduced. Solid-state structures of the covalent interactions with 1,2-, 1,3-, and 1,4-glycols have been characterized by single crystal X-ray diffraction. 11B NMR is shown to be a convenient method for distinguishing 5-, 6-, and 7-membered chelate ring size. Site-specific binding to oligoalcohols proceeds under thermodynamic control, and association constants for these contacts have been quantified by NMR peak integration. Additional mechanistic insights and evidence for dynamic exchange has been gained through combined deuterium labeling experiments and variable temperature NMR studies with a model 1,2-diol. These binding events suggest broad implications for both the field of polyol sensing and the expanding science of boron-nitrogen analogues, including 1,2-azaborines.

Mollie Bello (Chemistry)
Mentor: David Tyler

“Making a Catalyst in order to Study the Break Down of Plastics and Other Polymers”

The break-down of plastics is an important area of research; however, the way in which these plastics break down is a very complicated reaction. In order to better understand how different environmental factors play a role in this degradation, the Tyler Lab has synthesized very weak polymers (polymers are the building blocks of plastics). Simple polymers of this type have already been synthesized, which is why my project has been focused on making these weak polymers with a more complicated structure. In order to make this reaction work, a catalyst is needed. In order to use this catalyst, it needs to be synthesized. The production of this catalyst is where my focus has been centered. When the reaction conditions described in the literature are used, I have proven that a different molecule is formed. Going forward on this project, I want to discover why the catalyst is not being formed, and what I can change about my reaction conditions in order to make the desired product.

Ajay Ryerson (Chemistry)
Mentor: David Tyler

“Utilizing Shear Reactor Technology for Optimizing the Ozonolysis of Alkenes Reaction”

Ozone is a great oxidizing agent because its byproducts are water and oxygen. Current ozonolysis processes are either slow or dangerous for large scale reactions though. The use of flow reactors is a new technology that solves these problems. We have developed a process for mixing ozone, water and an organic phase together to get our desired material out with little work-up or purification needed. We utilize the Sythetron shear reactor developed by Kinetichem to achieve this mixing. Current yields are comparable to those found in the scientific literature, but results from several experiments have shown that decreasing the volume of gas in the reaction will increase yields. We are very optimistic that once we have an ozone generator that can produce concentrated ozone we will be able to produce material at rates unprecedented in the literature, all while being easier to work-up than any oxidative process to date.

By what means can we effectively deliver a bigger quantity of safe, clean water to more people? Integrated water resources management (IWRM) is the dominant framework, calling for the integration of every scale of stakeholder power to achieve increased clean water access. Participatory decision making, capacity building, public-private partnerships, and valuation are four elements of IWRM that contribute to an effective water management project. Participatory mechanisms increase clean water access by incorporating the principle of subsidiarity. Capacity building creates sustainability by strengthening local resources that would otherwise restrict the expansion of clean water access. Public-private partnerships alleviate pressure on public institutions which may be incapable of water management independently. Valuation increases the economic viability of water projects. In an evaluation of two IWRM projects in Angola, participatory mechanisms and capacity building are most prominent. In addition, each project reflects the mission of their supporting organization: a social focus for the United Nations Development Programme and an economic one for the World Bank. The United Nations’ project in Angola is more effective in increasing clean water access, validating their human rights and community-based project structure.
Northern populations physiologically adapt to extreme cold by upregulating basal metabolic rate. The thyroid appears central to this adaptation. Thyroid hormones regulate metabolic responses to chronic cold among indigenous Arctic populations. However, it is unclear whether this adaptation among circumpolar groups predisposes them to autoimmune thyroid disorders (AITDs). This study addresses this question by examining correlates of seasonal variation in anti-thyroid peroxidase antibody (TPOAb) concentrations among the Yakut of Siberia. Anthropometric and biomarker data were obtained on two occasions (Summer 2009 and Winter 2011) on a sample of Yakut men (n=52) and women (n=88) (≥18 years old). TPOAb levels are higher in summer than winter in both men (P<0.01) and women (P<0.05). Women have significantly higher TPOAb levels than men (P=0.05), and are more likely to have an AITD (28% of women versus 4% of men; TPOAb >30 IU/mL). TPOAb concentrations are associated with several anthropometric dimensions among men (negative trends with weight [P=0.08]). Finally, changes in TPOAb showed a positive trend association with change in thyroid stimulating hormone (TSH; P=0.06) among men, but among women change in TPOAb was negatively associated with change in HDL cholesterol and showed a positive trend with change in triglycerides (P=0.01) and hemoglobin (P=0.08). This study documented important sex differences in AITD risk among the Yakut, and an unexpected drop in TPOAb levels between summer and winter.

Predicted SH3 Binding Motif in Drosophila aPKC is Required for Proper Localization of aPKC During Asymmetric Cell Division of Neuroblasts

Asymmetric cell division of Drosophila neural stem cells, neuroblasts, require the proper localization of factors that influence the orientation of cell divisions and future fates of mitotic progeny. Errors in the generation of this polarity could cause cells to overproliferate and become cancerous. In neuroblasts, atypical protein kinase C (aPKC) has been previously shown to be a key mediator in the generation of apico-basal polarity by localizing to the apical cortex and restricting fate determinants Numb and Miranda to the basal cortex during cell division. This allows the dividing neuroblast to maintain pluripotency while also generating a daughter cell that differentiates into neurons. Although the mechanism of how aPKC restricts basal determinants has become transparent, we seek to evaluate how aPKC itself is apically localized. Using a combination of genetic and biochemical approaches, we have found that a predicted SH3 binding motif within aPKC is necessary for apical polarization. We hypothesize that an SH3 domain containing protein binds to aPKC at this site and plays a role in stabilizing apical localization. Future research will be focused on finding interacting partners of this SH3 binding motif using a candidate gene-based approach.

Motionese: Subject to Preference?

Research by Kuhl, Coffey-Corina, Padden, and Dawson, 2005, demonstrated that typically developing infants prefer “motherese” speech to a non-speech analog. In contrast, children with autism spectrum disorder show the reverse preference, and the degree to which this is true predicts their developmental progress in processing properties of speech streams. I am investigating possible parallels to these findings in children's processing of human action; specifically, whether developmental skills in preschool-aged children predict the degree to which they prefer “motionese” versus a non-action analog (or the reverse), and whether the strength of their preference predicts the sophistication of their processing of intentional action. Preliminary results based on participation from forty 2- to 3-year-olds indicate a significant correlation between executive function skills and degree of preference for motionese versus the non-action analog. Should these findings be borne out in the full sample, they point to important links between the development of language and intentional action processing, and they may have implications for designing interventions for children developing atypically.
**Biomechanics of Jellyfish in Turbulence**

Presenter : Susan Brush  
Major : Marine Biology  
Mentor : Kelly Sutherland

Hydromedusan jellyfish are planktonic organisms and, as such, are exposed to ocean water motion that directly impacts how they eat, disperse and eventually spawn. To understand the effect that realistic levels of water motion has on individual organisms, our research examines the role that turbulence plays in the swimming behavior of hydromedusae. Using a laboratory turbulence tank, we observed the behavior of two species of hydromedusae with distinct body shapes at two levels of turbulence. We were able to establish that these two species occupy different depths within the water. While statistical comparison resulted in no significant difference in swimming speed and acceleration between turbulence treatments, qualitative comparisons between swimming patterns of the two species suggests that turbulence does influence the swimming trajectories of prolate individuals (bullet-shaped) compared to oblate individuals (plate-shape). Swimming behavior is closely tied with feeding behavior in hydromedusae. Therefore these findings indicate that turbulent conditions, which are ubiquitous in the ocean, may disproportionately influence feeding in certain species and could impact the overall success of these organisms.

**Effects of Pentamidine Derivatives on Myotonic Dystrophy**

Presenter : Jessica Choi  
Major : Biochem  
Mentor : Andy Berglund

Myotonic dystrophy (DM) is a genetic disorder caused by an expansion of the trinucleotide (CTG) repeats in myotonic dystrophy protein kinase (DMPK) gene. This disease is characterized by myotonia and is commonly presented as the inability to relax muscles after contraction. Currently, there is no known cure or treatment for this disease. However, a drug called, pentamidine, has been discovered to relieve the severity of the disease by decreasing the level of toxic RNA. More specifically, pentamidine has been demonstrated to rescue RNA splicing, which involves excising out introns and combining exons together in an mRNA sequence to ultimately provide a functioning RNA. Without proper splicing, mutations can give rise to serious diseases like DM. In order to decrease the severity of DM, a high concentration of this drug must be administered, which also inevitably results in a significant decrease in cell viability. Thus, designing a derivative of pentamidine with higher efficacy and lower toxicity is the primary goal of this project. Performing a simple substitution reaction (SN2) from a cyano group-containing core compounds and n-butyl lithium is an easy, yet powerful method to produce the derivatives. Some previously synthesized derivatives have shown promising results with less negative effects on cell viability (less toxic) and increased levels of splicing rescue, although further study needs to continue to search for the most effective drug.the overall success of these organisms.

**Testing Different Models for Cutaneous Thermal Hyperemia**

Presenter : Patricia Choi  
Major : Human Physiology  
Mentor : Christopher Minson

Currently, the assessment of cutaneous thermal hyperemia is done by locally heating the forearm skin from a baseline of 33 to 42 ºC at a rate of 0.1ºC/1s. The purpose of this study was to test two different heating protocols from the standard heating protocol. The first heating protocol decreased the target temperature to 39ºC compared to the standard heating protocol. The second heating protocol used gradual heating rate of 0.1ºC/60s compared to the standard heating protocol. Four microdialysis fibers were placed in the forearm skin of 16 young healthy subjects. In protocol 1 and 2 (female = 8, male = 8): (1) Control, (2) NO inhibitor, L-NAME (3) KCa channel inhibitor, tetraethylammonium (TEA), and (4) L-NAME +TEA . For both studies, skin sites were locally heated on the forearm from a baseline of 33ºC to target temperatures. After maintaining the target temperature for about 40 minutes, the four skin sites were heated to 43.5ºC to attain maximal skin blood flow (SkBF). SkBF was measured with Laser Doppler flowmetry. Data are presented as % maximal cutaneous vascular conductance (CVC), which equals blood flow divided by mean arterial pressure. In protocol 1, all drug sites attenuated plateau CVC from the control sites. Compared to the control plateau CVC, there was 80.1 % decrease with L-NAME, close to 77.6% decrease in the L-NAME +TEA site, and 35.2% decrease with TEA. In protocol 2, L-NAME and L-NAME + TEA sites showed attenuated plateau CVC, 29.1% and 32.2% decrease, respectively, compared to the control site.
Domain-Specific Heaven and Hell: A Matching Theory Method for Generating Permutations of a Popular Joke

Presenter: Noah Cooper  
Major: Computer & Information Science  
Mentor: Michael Hennessy

Heaven is where the police are English, the cooks are French, the mechanics are German, the lovers are Italian, and it's all organized by the Swiss. Hell is where the police are German, the cooks are English, the mechanics are French, the lovers are Swiss, and it's all organized by the Italians. So goes the well-known joke reflecting some positive and negative stereotypes of European nations. Every intellectual community, too, has its famous methods, theories, and authors -- each known for its merits as well as its shortcomings. So it would seem fertile ground for parodies of the European Heaven & Hell joke. But it turns out this joke has a peculiar structure that resists parody. My work analyzes that structure, demonstrating why an ad-hoc attempt at parody is prone to fail. It proposes an alternative algorithmic approach to generating parodies based on matching theory, a subfield of graph theory in finite mathematics. In so doing, I hope it makes some small contribution to the body of knowledge on computer-generated humor and the semantics of humor. "noise" produced by background turbulence may inhibit the capacity of the ctenophore to detect and respond to fluid motions produced by its prey.

Presenter: Michaeli Francisco  
Major: N/A  
Mentor: 

Tetraethylammonium (TEA) abolishes a large portion of the vasodilation observed with both cutaneous thermal and reactive hyperemia by blocking calcium-sensitive potassium (KCa) channels. Some studies have shown effects of TEA on other potassium channels such as inward-rectifying potassium (KIR) channels, which are activated by increases in extracellular K+ and blocked by barium (Ba2+). Our primary goal was to test the specificity of TEA to KCa channels by ensuring TEA had no effect on KIR-mediated vasodilation to KCl. Furthermore, the effects of KIR channels in the skin has not previously been explored. Recent research suggests KIR channel activation to be the predominant contributor to ATP-mediated dilation in the forearm. Therefore, our secondary goal was to assess KIR-mediated vasodilation in response to ATP. The following drugs were continuously infused via microdialysis: 1) Control; 2) 50mM TEA; 3) 0.1mM barium chloride (BaCl2; KIR channel blocker). KCl was infused for 2 min at each site at 1mM and 10mM doses. Following KCl infusions, a single dose of 30mM ATP was infused for 1 min at each site. Dilation was characterized as Δ peak from baseline, and presented as % maximal cutaneous vascular conductance (CVC). KCl mediated vasodilation at the control site (1mM: 11.0±2.7%, 10mM: 10.4±2.3%) indicated 1mM KCl is sufficient to achieve complete activation of KIR channels, which is only ~10% of max. TEA had little effect on KCl-mediated vasodilation (1mM: 7.2.0±2.2%, 10mM: 9.2±3.1%) suggesting TEA does not affect KIR and/or Na+/K+ATPase pumps. Dilation to KCl was attenuated but not blocked by 0.1mM BaCl2 (1mM KCl: 6.0±1.7%, 10mM KCl: 4.9±2.0%). This indicates Na+/K+ATPase could also be responsible for a large portion of KCl-mediated vasodilation in the skin. ATP-mediated vasodilation was largely independent of KIR channel activation (Control: 43.7±14.0%, BaCl2: 41.0±11.4%). However, TEA blocked a large portion of ATP-mediated dilation (TEA: 11.6±4.5%) implicating KCa channels as a primary mechanism in ATP-mediated vasodilation in the skin.

Determining the Effects of Essential Amino Acid Supplementation for Total Knee Arthroplasty Patients

Presenter: Caitlin Gibson  
Major: Human Physiology  
Mentor: Hans Dreyer

Osteoarthritis affects 60% of the US population over 65 years of age. Total Knee Arthroscopy (TKA), used to mitigate osteoarthritis knee pain, is the leading cause of hospitalization for adults, ages 45-84 years old. The most significant clinical barrier following TKA surgery is persistent muscle atrophy and weakness. Previous research has shown that essential amino acid (EAA) ingestion is a potent means to stimulate muscle protein synthesis in older adults. PURPOSE: To determine the effects of twice-daily ingestion of 20g of EAA for 1 week prior to, and for 2 weeks post-TKA, on muscle mass, strength, and functional mobility. METHODS: Magnetic resonance imaging (MRI), isometric quadriceps strength and functional mobility were obtained at baseline, 2 and 6 weeks post-TKA from older adults supplemented with EAA or placebo. RESULTS: Quadriceps muscle atrophy was greater in the placebo group at 2 and 6 weeks post-surgery. The intervention group had significantly less loss in quadriceps strength and performed significantly better at 2 and 6 weeks post-surgery on functional mobility tests. CONCLUSIONS: Our results show that TKA surgery is associated with significant muscle atrophy, declines in muscle strength and reductions in functional mobility. Our findings will help us to better understand the potential for EAA supplementation in order to attenuate muscle loss and boost recovery of muscle mass, strength and function following TKA in older adults.
River Stories: Preserving and Sharing Oral Histories and Traditions of the McKenzie River Valley Using Video and Audio Media

Presenter: Starr Hathway, Adrian Robins, Jacob Sembler  
Major: Environmental Studies, Cinema Studies  
Mentor: Kathryn Lynch

The McKenzie River Valley sustains a unique heritage that is in danger of being lost. The purpose of River Stories is to preserve the oral histories and traditions of the area before they are forgotten. Our goal is to share the stories we collect with the Eugene/Springfield community, as well as the residents of the McKenzie Valley and their families. The River Stories team is collecting these accounts from McKenzie River area residents that run the spectrum from river guides to local artisans. While conducting weekly interviews, the team employs an anthropological approach to capture the endangered community knowledge, specifically using audio and video formats. River Stories then uses transcription, audio logging, and video editing to create a product that is ready for community-wide dissemination. Thus far, 13 weeks of fieldwork have yielded findings that help piece together the McKenzie’s grander story. The team has interviewed 20 individuals from over a dozen pursuits including boat building, fly fishing, and sustainable agriculture. This term, the team is developing a mini-documentary series which aims to communicate findings to the Eugene/Springfield community. This project will encourage further documentation and appreciation of the McKenzie River Valley, setting a foundation for the connection of generations and neighboring communities.

A Comparison of Hip Joint Extension, Thigh Segment Extension, and Pelvic Tilt Between Individuals Who Exhibit Poor Hip Extension and Individuals With Good Hip Extension.

Presenter: Richard Howey  
Major: Human Physiology  
Mentor: Li-Shan Chou

Full 3D kinematic analysis is often used for biomechanical assessment of running mechanics and corresponding injury risk. However, conclusions drawn from these analyses are highly dependent on data analysis methods. For example, poor hip joint extension (HJE) at toe-off is often interpreted clinically as resulting from weakness in extensor muscles. However, because joint angles are often calculated as movement of the distal segment relative to the proximal, two absolute orientations may result in the same calculated joint angle. Therefore, poor HJE could result in movements of the thigh or the pelvis. The purpose of this study is to compare hip joint, thigh segment and pelvic tilt angles in runners with good and poor HJE. Data from this study were drawn from a database of 100 runners who had been analyzed in the motion analysis laboratory. Ten individuals with HJE 1.5 standard deviations above and below the database mean comprised the good and poor groups, respectively. While the two groups were different in HJE (good: M = -15.28° ± 1.34°; poor: M = 3.51° ± 4.94°; p < .001) the angle of the thigh segment relative to vertical was not different between groups (good: M = 3.52° ± 8.38°; poor: M = 3.41° ± 4.94°; p = .991). The pelvis angles also were significantly different between groups (good: M = -4.88° ± 8.76°; poor: 7.17° ± 8.03°; p = .005). These findings suggest that pelvic instability should be considered in addition to weakness in hip extensors when reduced HJE is observed.

Spatiotemporal Patterns of Inversion Allele Frequencies in Threespine Stickleback

Presenter: Erika Jackson  
Major: Biology  
Mentor: William Cresko

Chromosomal inversions have been linked to complex traits that facilitate adaptation in new environments in a small number of studies. However, the generality of this pattern is still unclear. Studying the frequency of chromosomal inversions in threespine stickleback (Gasterosteus aculeatus) could provide an important case study to help us understand the role of chromosomal inversions in adaptive evolution. We focused on Alaskan and Oregon marine and freshwater stickleback populations to determine inversion frequencies between distant locations as well as between salinities in different bodies of water. We predicted that inversion allele frequency divergence between ocean and freshwater populations would occur if the inverted region contained genes important for adaptation to the alternative environments. We genotyped a large number of individuals for an inversion on Linkage Group XXI using polymerase chain reaction (PCR) designed to indicate alternate forms of the inversion. Our results showed that the inversion allele frequencies are highly divergent between Alaskan oceanic and freshwater populations. In addition, while Alaskan populations are geographically distant from Oregon populations, we found a similar pattern of divergence between Oregon populations in the two habitats. Our study provides additional evidence that chromosomal inversions may play an important role in adaptation to novel environments.
Plant litter from aboveground and belowground production constitutes a major carbon (C) and nutrient input to forest soils worldwide. Uncertainty in the relative effects of these two biomass allocations on ecosystem structure and function is the impetus for the Detritus Input Removal and Transfer (DIRT) experiment, which incorporates root trenching and leaf litter removal and addition. In this study, we sampled mineral soils from DIRT plots at a temperate hardwood forest in Northwestern Pennsylvania in the 0-10 cm depth for all treatments and additional organic horizon and 10-20 cm profile depths for control (CO) and double litter (DL). This DIRT site was established in 1991. By incubating samples at 35°C and near-optimal moisture content for 56 weeks, we estimated maximum potential respiration and net nitrogen (N) mineralization and used the resulting cumulative values to compare rate constants and pool sizes for 1 and 2 pool exponential models among treatments. Net N mineralization in DL plots was significantly greater than CO ($\alpha=0.05$) at 10-20 cm, while the no input (NI) treatment was significantly less than CO and DL ($\alpha=0.05$) at 0-10 cm. We also provide evidence that the treatment effects will continue to become more significant on longer time-frames. From these results, we suggest soil C and N pools are affected by plant litter allocation ratios on decadal time scales, and the most rapid effects may be outside of the pools in the uppermost mineral soil horizons.

**AICAR Administration Promotes a Cytoprotective and Pro-Angiogenic Stimulation in an Ex Vivo Model of Placental Ischemia.**

Presenter: Sarah Johnson  
Major: Biology/Human Physiology  
Mentor: Jeffrey Gilbert

The pregnancy-specific hypertension known as preeclampsia (PE) is widely observed worldwide and is recognized as a leading contributor to sickness and death of a mother and her baby. This pervasive condition is yet to be fully characterized, as is an effective therapy of symptom relief outside of inducing early delivery. We have recently reported treatment with an adenosine-mimetic, AICA-riboside (AICAR), in an experimental model of PE reduces the onset of PE-like characteristics; however, the underlying mechanisms are poorly understood. Therefore, our hypothesis was AICAR would initiate cytoprotective and pro-angiogenic stimulation in cultured placental tissue explants, and this effect would be mediated by the adenosine (ENT1/2) transporter. Tissues were cultured at 37°C for 12 hours in physiologic normoxic (8% O2) or hypoxic (1.5% O2) conditions, and treated with AICAR (2mM) and an adenosine transporter blocker (dipyridamole, DPM) (100µM). Explants treated with AICAR exhibited a decreased ($P<0.05$) secreted sFlt-1 in both O2 conditions, and DPM blocked this effect. The energy regulatory protein AMPKa phosphorylation was elevated in the tissues treated with AICAR, but was not statistically significant (0.1>$P>0.05$). Through modeling placental ischemia ex vivo, we have demonstrated AICAR decreases placental secretion of sFlt-1, mediated by adenosine transport activity. In concert with our previous in vivo studies with AICAR, this study further supports a placental specific mechanism of AICAR’s actions in vivo.

**Tracing the Endocardial Cell Lineage of Developing Heart Valves Using MADMMatter Pools?**

Presenter: Amy Jones  
Major: Biology, Human Physiology  
Mentor: Kryn Stankunas

Heart valve development is a complex, multi-step process. During development, endocardial cushions form at specific locations in the early heart tube. These cushions are populated by endocardial cells that delaminate in a process known as epithelial-mesenchymal transformation (EMT). In the mouse, EMT takes place between embryonic day 9.5-10.5. It is a vital process to understand since the heart valves are derived from this cardiac cushion tissue. Current models of cushion EMT suggest that a large number of endocardial cells undergo EMT. An alternative hypothesis is that only a few individual cells initially populate the cushions that then proliferate to expand cushion mesenchyme. To better understand how endocardial-derived cells contribute to heart valves, I am using a novel mouse genetic system termed MADMM (mosaic analysis with double markers). MADMM uses the Cre-lox system to permanently label specified cells by fluorescent protein expression. For my studies, I use the Tie2 promoter to direct Cre expression and instruct the MADMM system to specifically trace the endocardial cell lineage. The low frequency by which labeled cells are generated allows me to exquisitely monitor contributions of clonally-related endocardial cells to developing valves. By gaining a complete understanding of the contribution of endothelial-lineage cells to developing valves, we can identify when embryonic heart malformations originate, supporting the development of therapeutics to prevent defective valves from progressing to a diseased state.
Approximately 136,000 sports related concussions are diagnosed within the high school athletic population annually with little known about the longitudinal impairments that follow. The objective of this study was to investigate the longitudinal effects of concussion on gait during an obstacle-crossing task. Concussed subjects (n=20) were diagnosed by a physician or certified athletic trainer. Control subjects (n=20) were matched by height, weight, age, and sport participation and examined in similar time increments. Gait variables examined were average walking speed, step length, step width, cadence, and obstacle clearance height during an obstacle-crossing task. Subjects were tested at 72 hours, 1 week, 2 weeks, 1 month, and 2 months post-concussion. We hypothesized that concussed subjects would have decreased average walking speed, step length, cadence, obstacle clearance height, and increased step width compared to control subjects. Motion data was collected using 29 reflective markers and a 10-camera motion analysis setup. Subjects were instructed to walk over an obstacle set at approximately 10% of their height. Of the five variables investigated, step length and width showed the greatest differences between groups. Step length of concussed subjects was less than control subjects over the two months. Additionally, step width of concussed subjects was greater over the two months following injury. These results suggest altered walking performance while crossing obstacles in concussed individuals while recovering.

**Ducks Quacking - UO Network Characterization with NetFlows**

Intra/Inter-network traffic has become an important part of our daily lives. Its become a primary means of communication through email, messaging, and social networks (e.g. Facebook, Twitter). The University of Oregon represents a small community environment encompassing student housing and the daily activity of classes, staff and professors carrying out research, administration and services to keep the campus functioning. The University's network backbone thus provides a potential data source for studying how society uses internet applications in their daily activities. This project evaluates the potential of using anonymized netflows obtained from the UO Network and Telecom Services (NTS) to characterize network activity. Netflow records are provided with local addresses anonymized from UO border routers to preserve confidentiality. The records are aggregated and stored in a database for later characterization of network activity. The characterization includes packet rate, bandwidth utilization, applications (unique ports), and distribution of destination IP address. We can then look at how this characterization differs with different areas of campus (dorms, offices, wifi) and temporal patterns. The results show that netflow records will provide a valuable data source for studying how a community setting uses internet applications in carrying out their daily activities.

**Alkaline Synthesis of Amidines - A New Approach to Preparing Medicinally Relevant Small Molecules**

Myotonic dystrophy (DM) is the most common adult form of muscular dystrophy. Recently, the small molecule pentamidine has been shown to relieve symptoms of DM in cell models; however, pentamidine is an inadequate drug for DM because of toxicity and bioavailability problems. Analogs of pentamidine, generically termed amidines, have proven to be significant candidates in the search for an effective cure for DM. It is therefore important to have access to the widest possible range of amidine structures for study against symptoms of DM. Existing methods of synthesizing amidines have largely depended upon reactions with acidic conditions; features of these reactions have limited the accessible range of amidines, especially substituted amidines. Here we outline a new method of preparing substituted amidines using alkaline conditions that features shorter reaction times, better yields, and better compatibility with many of our compounds of interest. Through synthesis and NMR characterization, we explore the range of usable starting materials, test the method's selectivity in the presence of competing reactions, and demonstrate its application to the synthesis of several novel compounds. This method makes possible a host of new substituted amide compounds that could prove useful in the search for a cure for DM, and provides a new, potentially more efficient, synthetic path to unsubstituted amidines for the same purpose.
Tour de Fans: An Exercise in Comfort

Presenter: Erik Larson, Kyle Stuart-Willis, Robert Nicholls
Mentor: Alison Kwok
Major: Architecture

We are architecture students at the University of Oregon investigating into the Environmental Control Systems of an architectural space and the level of success for their implementation. This study analyzed the UO Rec Center’s spinning (stationary bike) exercise room and how human activity affects environmental conditions. By studying the temperature and relative humidity during a class we were able to understand human-generated heat in a room and apply more ventilation equipment in order for the room to remain in the architecturally-defined “comfort zone” (defined by ASHRAE standard 55) for a longer period of time. We hypothesized that a third fan added during a spin class would increase the time spent in the comfort zone by 20%. The study took place over 2 weeks to gather data with multiple controlled variables. Devices known as HOBO data loggers took intermittent measurements of the classroom's temperature and relative humidity. We concluded that the implementation of a third fan dramatically increased the classroom's circulation, resulting in highs up to 46% lower in temperature and 35% lower in relative humidity. Our investigation shows that proper research of the ventilation/air circulation of an architecturally-designed space results in a more pleasant environment for users and a greater contribution to society for the architects involved. We also learned that participating in multiple spin classes leads to great glutes.

Molecular Evolution of Indian Hedgehog Following the Teleost Genome Duplication

Presenter: Ryan Loker
Mentor: Ingo Braasch
Major: Biology

Indian Hedgehog (IHH) is a signaling molecule that acts in several important developmental processes in vertebrates including gut, vascular, and skeletal development. Duplicated (paralogous) copies of the ihh gene have been retained in the teleost fish lineage, ihha and ihhb, following the teleost genome duplication (TGD). The mechanisms of evolution following a whole genome duplication are not completely understood, but one possible reason that ihh and many other duplicates remain in the teleost genomes is that each paralog carries out essential sub-functions of the ancestral pre-duplication gene, following the Duplication-Degeneration-Complementation (DDC) model. Investigation of this mechanism requires characterization of the regulatory elements controlling expression of ihh genes in teleosts as well as the ancestral state, which can be represented using spotted gar (Lepisosteus oculatus), a member of a sister group to teleosts with an unduplicated genome. Here, we use a comparative genomics approach to compare the genomes of several teleosts and gar in order to identify ancestral conserved non-coding elements (CNE) representing possible regulatory elements, and test their functionality in vivo using transgenic reporter constructs in zebrafish (Danio rerio). In addition to the insight of the evolutionary mechanisms, characterizing enhancers of ihha and ihhb will provide an opportunity to further characterize the role of these genes in developmental pathways, which are commonly conserved throughout vertebrates including humans.

What’s in my Dust? Communicating Research Findings to Agricultural Families

Presenter: Rossmary Marquez
Mentor: N/A
Major: Human Physiology

The collection of environmental samples represents a responsibility to return study findings to participants. However, developing appropriate and understandable messages can be challenging due to language differences and cultural differences. A previous study collected information from families living in an agricultural community about ways they may be exposed to pesticides and the impact of pesticides on the health and neurological development of their children. A total of 483 dust samples were collected over 4 years. The dust samples collected were analyzed for four organophosphate pesticides. The goal of this study was to evaluate different formats for presenting study findings to participants. Material presenting the results of pesticide concentration was developed along with materials describing methods to reduced exposure. A pilot study was designed to determine which format should be used and questions were designed to evaluate knowledge and reaction to the data. English speakers and Spanish speakers were recruited for the study. It was determined that education and language impacted people’s ability to read and understand the graphs. Higher education was associated with higher quiz scores. English speaking group scored higher. Finding the best ways to return results is still a challenge. Feedback received form the community members was utilized to design an effective and appropriate intervention material to reduce pesticide exposure and inform the families about the pesticides levels found in their homes.
Reoccurring goals, such as exercising every other day, are important for health and work-life balance, yet seem to be quickly disregarded as soon as other deadlines and daily stressors enter our lives. Given that information presentation affects how one processes and acts upon the information, could a different display design other than a standard weekly planner increase an individual's chances of completing his or her goals? Specifically, could a visual object display lead to increased motivation and more goal completions compared to a text based display? Three different goal monitoring tools were created to answer this question: an Android app that shows goals as squares that visually stretch out as goal deadlines approach, another Android app that lists the goals and their deadlines by text, and a paper planner consisting of two calendar weeks. Participants were randomly assigned one of these three tools and asked to monitor their own reoccurring goals for two weeks, completing nightly questionnaires asking about motivation level, goal completion, and affect. It is predicted that the visual app will lead to more goal completions, higher motivation, and higher levels of both positive and negative affect compared to the two text conditions. Data analysis has yet to take place, but will be completed by May 16, 2013. Importantly, the study may suggest new ways in which display design can be utilized to help people achieve personal reoccurring goals.

Investigating the Effect of Heat Shock on Lifespan and Gene Expression in C. remanei

Presenter : Sarah Mete
Major : Human Physiology

Low doses of various stressors have been shown to slow the process of aging and increase tolerance to future stress in numerous organisms, a phenomenon known as hormesis. Previous studies conducted using C. elegans have examined heat-induced hormetic effects on lifespan; however, the presented data is conflicting and inconclusive. Studying the hormetic response to sub-lethal heat shock in C. remanei can help us understand the underlying mechanism of hormesis and its effect on lifespan in a new model organism. We predicted that exposing an outbred population of C. remanei to either a mild heat stress, an acute heat shock or a combination of the two would produce a hormetic response in lifespan, observing the most beneficial response in those exposed to both treatments. The worms were raised either at 20°C, or exposed to a mild heat stress of 30°C during larval development. A subset of worms from each group were then subjected to a 36.8°C heat shock for 1 hour. We measured lifespan for each group in adult, virgin females maintained at 20°C. Surprisingly, no significant differences in lifespan were observed across the various conditions. These results stimulated the idea of using RNA-sequencing to evaluate changes in gene expression to explain why no response in lifespan was observed. The sequencing data illustrated significant changes in gene expression associated with both the mild and acute heat treatments, indicating a large enough change to compensate for the heat stress but not enough to affect lifespan.

Examination of Executive Function Measurements in Healthy Adolescents and Young Adults

Presenter : Madison Murray
Major : Biology

Executive function has been defined as the ability to utilize external stimuli in order to plan purposeful action. It is thought to be important for tasks like problem solving and decision-making. As the adolescent brain has not yet reached full maturation and is undergoing rapid development particularly in the frontal lobe, where executive function is considered to take place, it may be vulnerable to trauma during this time of life. Due to the continued development of the frontal lobe in the adolescent brain it was hypothesized that healthy adolescent individuals would have decreased executive function ability when compared to healthy young adults. The Attentional Network Test and the Task Switching Test were administered to 14 healthy individuals (7 adolescents, 7 young adults) five times over a period of two months. Testing was carried out 1 week, 2 weeks, 1 month, and 2 months after the initial testing. Testing was performed in a computer lab to free from noise or visual distractions. Young adults displayed faster overall reaction times, however contrary to our hypothesis; preliminary data has shown that adolescents have increased executive function ability compared to young adults. Further research will examine the effects of concussion of the adolescent brain compared with an adult brain. In order to make an accurate comparison between concussed individuals we must first compare healthy individuals.
**Synthesis of a Water-Soluble Macrocyclic Iron-Phosphine Complex**

Presenter: Aditya Nathan  
Major: Biochemistry

Although society is progressing towards increased dependency on alternative sources of energy, natural gas remains as one of the most relied upon sources of energy. A major contaminant of natural gas is dinitrogen. Our research focuses on the synthesis and characterization of a water-soluble macrocyclic iron-phosphine complex that is capable of reversibly binding dinitrogen. Our intended method for developing such a complex involves a multistep process beginning with a template synthesis, which involves the coordination of open-chain phosphine ligands to a transition metal atom (specifically Ni(II), Pd(II), or Pt(II) for the sake of square planar geometry). Subsequently, the components would be linked/bridged together using base and an alpha/omega dihalide to form the macrocycle. The complex would then be demetallated using cyanide ion or a sulfide source and subsequently coordinated to Fe(II). In order to confer the complex with water-solubility, we plan on adding water-soluble functional groups to the side chains of the macrocycle. Thus far, we have been able to synthesize and characterize key intermediate complexes that serve as the precursor for the macrocycles. In addition, we have investigated methods for macrocyclizing the intermediate complexes.

**Evaluating 2D and 3D Methods of Measuring Fluctuating Asymmetry of Primate Skulls**

Presenter: Colin Oliveira, Lauren Moore  
Major: Anthropology

Morphological fluctuating asymmetry (FA), particularly cranial FA, can be used as an indicator of past developmental instability or environmental stress. Primate FA has been measured using a variety of two and three dimensional methods either directly from specimens or from images. We compared the effectiveness of three methods of calculating FA: Microscribe readings of three dimensional landmarks on the specimen, two dimensional landmarks measured from photographic superimposition using tpsDig, and linear distances using digital calipers on the specimen. Three observers used each of the three methods on two Macaca fuscata skulls, one that appeared asymmetrical and one that appeared symmetrical, using 5 midline points and 7 bilateral points for 5 replicates. Measurements taken by each method were compared between the two specimens. Measurement in 3D space via Microscribe exhibited no significant interaction term, no significant difference between observers (F=1.22, df 2,24, p=0.3119), and significant difference between specimens (F=5.56, df 1,24, p<0.05). Measurement of 2D distances from photographs via tpsDIG exhibited no significant interaction term, significant difference between observers (F=9.78, df 2,24, p<0.001), and significant difference between specimens (F=10.80, df 1,24, p<0.01). Measurement of linear distances via digital calipers exhibited no significant interaction term, no significant difference between observers, and no significant difference between specimens.

**Variation Through Tooth Wear Obscures the Differential Diagnoses of the Fossil Beavers Dipoides stirtoni and Dipoides smithi**

Presenter: Savannah Olroyd  
Major: Biology

Diagnostic features that show variation can be problematic when their variation interferes with clear distinction between species. Fossil identification can be further confounded when highly variable supposedly diagnostic dental characters change with tooth wear. The fossil beavers Dipoides stirtoni and Dipoides smithi are distinguished from one another by the presence or absence of striations on the fourth premolars. D. stirtoni has a parastria running down the cheek side of the upper P4 and a parastrid on the tongue side of the lower p4 in all wear stages. D. smithi lacks the parastrid and only occasionally has a parastrid in later wear stages. We have reviewed this diagnosis by examining over 200 cheek teeth of both species. No well-worn upper P4s of D. smithi have a parastrid, but the parastrid is present in the earlier wear stages of all upper cheek teeth. Approximately 25% of the lower p4s of D. smithi studied had a parastrid in later wear stages, and one D. stirtoni lower p4 had no parastrid. We investigated other dental characters to see if other features were diagnostic to these species. The two are indistinguishable in tooth size, molar shape, and wear stages. The current diagnosis makes confident identification of new specimens difficult unless the specimen includes a well-worn upper P4. Complex series of tooth wear can produce a large amount of apparent dental variation in mammals with high-crowned teeth. Caution should be taken when using dental characters to assign diagnoses to such taxa.
Over the last few decades, the construction industry has been increasingly concerned with its impacts on the environment. This relates both to the production and the operation performance of materials and assemblies. The purpose of this study was to evaluate the thermal performance of post-consumer cork stoppers re-used as insulation for OSB panels. With the use of an insulated HotBox and HOBO U12 data loggers, a sample of a cork stopper-insulated panel was tested for heat flow and thermal resistance, and compared to a panel insulated with commercial extruded polystyrene foam. The results showed that the repurposed cork insulation had a performance 17.3% higher than that of the commercial alternative. Repurposing post-consumer waste could diminish the amount of cork going to landfills, which is approximately 13 billion each year (13). Cork is a naturally produced, highly insulative material, which makes it a potential material for high-performance building construction.

**Stopping Heat: A Study of Repurposed Cork Insulation**

Presenter: Sebastian Oviedo, Maria Burbano  
Major: Architecture

**Altered Lung Development in Growth Restricted Offspring from Hypertensive Pregnant Rats**

Presenter: Alice Rear  
Major: Biology and Human Physiology

Recent studies suggest that angiogenic dysregulation in utero impairs fetal pulmonary vascular development and arrests normal alveolarization, potentially contributing to the pathogenesis of bronchopulmonary dysplasia (BPD). Since reduced utero-placental perfusion (RUPP) induced hypertension is associated with angiogenic imbalance (soluble fms-like tyrosine kinase-1, sFlt-1; and vascular endothelial growth factor, VEGF) in the maternal circulation and amniotic fluid, we hypothesized it would result in abnormal alveolarization, diminished pulmonary vascular development, and impaired VEGF signaling in the fetal rat lung. Fetal lung tissue and amniotic fluid were collected on day 19 of gestation from RUPP and normal pregnancies (NP). A second cohort delivered pups that were weighed at birth and lungs were collected at 10 weeks of age. Fetuses from RUPP pregnancies were smaller at day 19 (2.1 vs. 2.6 g; P<0.05) of gestation and at birth (6.1 vs. 6.7 g; P<0.05) than NP offspring. Preliminary data suggests that RUPP offspring may have reduced (20% decrease) pulmonary vascularity and alveolar simplification (45% decrease in alveolar space) when compared to normal pregnant controls. VEGF receptor-2 was decreased (48%; P< 0.05) in the lungs of day 19 RUPP offspring. These data suggest that chronic placental insufficienty has detrimental effects on the developing pulmonary vasculature and alveoli, and support the hypothesis that angiogenic imbalance in utero may play an important role in the pathogenesis of BPD.

**The Role of the BAF Chromatin Remodeling Complex during Heart Valve Development**

Presenter: Maithri Sarangam  
Major: Biology

Human heart valves are remarkable structures that open and close billions of time during a lifetime. Like any structure under constant mechanical strain, their shape and molecular composition are finely tuned to maximize efficiency and longevity. The development of these valves must also be finely tuned to produce proper the shape and composition, or dangerous health consequences may arise. We are studying the developmental processes of valve formation. Particularly, we are interested in the role of the BAF chromatin remodeling complex. Chromatin refers to the complex of DNA and histone proteins. Cell nuclei contain a series of cylindrical histone complexes, around which DNA is wrapped. The structure resembles a single thread wrapped around a series of spools with approximately 2 loops per spool. The BAF complex regulates gene expression by altering nucleosome positioning. We believe the BAF complex is required for the proper development of the aortic and pulmonic valves. We used mouse models and complex mouse genetic techniques to study the role of the BAF complex on mammalian heart valve development. Using a cre-lox system, we caused a loss of function of the BAF complex by knocking out Brg1, the key ATP-ase required for the complex to function. We then used various staining methods to study the resulting phenotype at different time points during the later stages of development. The results suggest that the BAF complex is required for proper organization of the valve shape and molecular composition.
**Electron Diffraction in a Scanning Electron Microscope**

Presenter: Alexander Schachtner  
Major: Physics

We use focused ion beam nanofabrication to manufacture forked diffraction gratings capable of producing electron beams with helical wavefronts and orbital angular momentum (OAM). A vast number of unique beam modes carrying OAM can be produced through manipulation of grating fork number or position. Generally these gratings are milled such that they produce a phase shift in the beam and are used with high energy electrons (300keV) in a TEM to investigate the quantum or magnetic properties of the electron or image magnetic materials. Our latest work focuses on manufacturing gratings that produce only an amplitude shift, which opens up imaging capability to lower energy electrons (5-30 keV) and thus expands their use to a wider range of commercially available SEMs. We use these amplitude gratings to show the relationship between the number/position of forks and OAM inherited by the beam. This work could lead to advances in imaging capability, and also creates a widely accessible and scalable demonstration of the quantum properties of the electron which can be leveraged by any science program with SEM access.

**Senior Honors Thesis on Attitudes Toward Gay Marriage**

Presenter: Daniel Schwartz  
Major: Sociology

A majority of Americans have been opposed to same-sex marriage since public opinion polls first began asking about it in 1988. However, beginning in 2010, attitudes in support of same-sex marriage began to outweigh opposition. This senior honors thesis helps explain why and how Americans’ attitudes have shifted toward greater support for same-sex marriage. I also thoroughly examine the homophile movement, and propose that without it being so robust, Americans’ attitudes would remain largely opposed today. I relied on existing data from the General Social Survey. My hypothesis was that age cohort would be the strongest determinant of one’s attitude toward same-sex marriage, and my findings supported my hypothesis. While previous literature has examined the strong impacts the homophile movement has had on the public, it has not empirically examined the correlates of the shift in attitudes. Additionally, my research contributes to the dialogue on same-sex marriage as a currently contentious civil rights issue. Homosexuals are the only minority groups that do not enjoy the same marital rights as non-homosexual minority groups. But considering the recent legislative attention same-sex marriage has received, it is likely that homosexuals will soon be granted the right to wed.

**An Electronic Art Installation**

Presenter: Athan Spathas  
Major: Sociology

This is an electronic art installation: using the Arduino (an open-source microprocessor), an accelerometer (which measures tilt and acceleration), an electronic drum-pad (midi-controller), and the computer program ‘Max’ to design a multi-person instrument. The accelerometer is on a cord which can be swung like a pendulum (hence that part is an electronic pendulum), and its lengths can be adjusted to demonstrate how it swings faster or slower (educational for explaining the functions of a pendulum). As it swings, the accelerometer measures the velocity at which it’s moving, and controls the amplitude of the tones which are controlled by the drum-pad. To summarize, I made an instrument that you can swing in a variety of ways to manipulate sound, and can be used in conjunction with other instruments to create an interdependent sound (this primarily came from 2 classes I took this year which are brand new, with Chet Udell in the Music (Technology) Department, Sensormusik & Computer Network Music).
### Bullying, Victim, and Aggressor: Past Experience versus Current Behavior

**Presenter:** Fushu Tan  
**Mentor:** Holly Arrow  
**Major:** Psychology

Bullying is the most common type of violence in American schools, and the consequences can persist into adulthood, affecting school achievement, prosocial skills, and psychological well-being for both victims and bullies. The current study examined whether past experience with bullying affects how likely college students are to intervene when someone they know is bullied. 120 college students (50 males, 70 females) completed a questionnaire that assessed their past experience with physical and relational aggression. They then read a scenario that asked them to imagine a real-life situation of bullying. Next, they decided whether they would intervene by contacting the aggressor, the victim, or both. Over 95% of participants reported some past experience as both aggressor and victim. Unexpectedly, males reported significantly more past experience as relational aggressors than females. Over half the participants said they would intervene by contacting both victim and bully. However, past victimization experience did not increase the likelihood of intervening. In fact, past experience scores tended to be somewhat lower for those who intervened. The only significant past experience predictor was that those who chose not to intervene at all tended to have more experience as a bully. The findings provide additional evidence that exposure to bullying often includes experience as both aggressor and victim, and that can complicate an understanding of how this experience affects future decisions to intervene.

### Do Distinct Types of Progenitors Contribute to Enteric Nervous System Development?

**Presenter:** Charlotte Taylor  
**Mentor:** Judith Elsen  
**Major:** Biology

The enteric nervous system (ENS), the largest component of the peripheral nervous system, provides intrinsic innervation of the intestinal tract and modulates gut function. The ENS forms a complex network of different neuronal subtypes and glial cells. ENS progenitors originate in the hindbrain, migrate to the gut, migrate caudally along the gut in two parallel streams, and eventually encircle the gut. ENS progenitors express different marker genes, e.g. phox2b, sox10, and ret. Our goal is to take advantage of the zebrafish model to learn whether expression of these marker genes designates distinct ENS progenitor populations. We used a phox2b:GFP transgenic line that expresses in ENS progenitors and double fluorescent in situ hybridization to quantify progenitor marker gene expression and colocalization in GFP+ cells. Our analysis suggests that subpopulations of enteric progenitors are present during zebrafish ENS development. These subpopulations are characterized by the following marker combinations: phox2b/sox10/ret, phox2b/ret, and phox2b. Our data also suggest that phox2b and sox10 expression is consistent along the length of the gut and ret expression is higher caudally. Our next step is to conduct lineage tracing studies to learn if distinct ENS progenitor subpopulations give rise to different ENS cell types, by tracing the offspring of genetically labeled subpopulations of progenitors. Traditionally, the Supreme Court has deferred to the President in times of war; however, following 9/11 the Court took an active role in placing limits on the President's unilateral powers. The Court's decisions in these cases were effective in restraining Executive power, but they only somewhat protected and restored the detainees' civil liberties. The protection of certain individual rights has been followed by the curtailment of others. Currently, the Obama Administration is facing criticism for the indefinite detention of detainees, and this study provides a framework which outlines how civil liberties can again begin to be restored.

### Deciduous Teeth Show Close Relationships Between Oreodont Genera (Euctrophus, Merycochoerus and Promerycochoerus)

**Presenter:** Kendra Walters  
**Mentor:** Edward Davis  
**Major:** Biology

Oreodonts lived during the Cenozoic Era, particularly from the Eocene to Miocene Epochs. They were abundant in the past but have no modern descendants. Classifying oreodonts is a difficult task because there is disagreement on the species, genus and subfamily classifications of many individual oreodont groups. The three genera of oreodonts we examined (Promerycochoerus, Merycochoerus, and Euctrophus) have experienced this problem and are divided between two to three different subfamilies. Our examination of the deciduous teeth of four individuals from these three genera found great morphological similarity, indicating a closer relationship than is currently recognized. We examined two individuals of Euctrophus trigonocephalus, one individual of Merycochoerus sp., and one of Promerycochoerus carrikeri from the collection at the University of California Museum of Paleontology. The deciduous premolars from all three genera are tellingly similar, varying only in size, and match previous descriptions of Promerycochoerus carrikeri. Similarities are especially evident in the last two deciduous premolars. These similar characters contradict the current subfamily divisions, indicating a close relationship between all three genera. We propose a re-division of oreodont subfamilies that reflects this close deciduous morphology. We also recognize synonymy of Promerycochoerus and Merycochoerus, as our examination primarily found size differences between them that we do not accept as genus-level distinctions.
Many US households earn an income greater than that specified by the Federal Poverty Level (FPL), a measure of poverty that does not vary across the 48 contiguous states, however, many households in the U.S who stand above the FPL still struggle to meet their basic needs and be financially self-sufficient. Although the FPL does not take into account the actual quantity of money required to meet the basic cost of living expenses across the United States, many financial assistance programs are designed solely to assist people below this line, especially federally administered programs. As there exists a percentage of population who stands above the 100% FPL but still not able to be self-sufficient, it is the ALICE (Asset Limited, Income Constrained, Employed) population. We are working on the research with United Way of Lane County who seeks a way to calculate the percentage population of ALICE and its distribution in Lane County. It is important to know the ALICE population as ALICEs has been suffering without sufficient income that will lead to a short and long-term suffering to the whole community. Our methodology is focused on meeting two separate objectives. The first objective is to calculate the number and percentage of ALICE population in Lane County. The second objective is to create a predictive model that will give United Way a tool to estimate future fluctuations in the size (but not the distribution) of the Lane County ALICE population so that they can better direct their programming to serve this group.
Index

10  Arpaia
    McGrew
    Shankman
11  Ingamells
    Leung
12  Kell
    Rheingold
    Witt
13  Bertoglio
    James
14  McKay
    Nguyen
    Valleau
15  Windrup
    Woolington
16  Carollo
    Arnold
    Petersen
17  Suneson
    Thane
18  Ly
    Shindelman
    Steinberg
19  Comnes
    Frey-Wyer
    Park
20  Barrett-Rivera
    Phillips
    Schafer
21  Smietana
    Tomlinson
    Slomoff
22  Bilyeu
    McNulty
23  Scott, Huynh
    Sosa, Senate, Keeler
24  Ward
    McHorse
25  Cudmore
    Gomez
    Chisholm
27  Harlow
    Bello
    Ryerson
    Stafford
29  Balu
    Boileau
    Brezack
30  Brush
    J, Choi
    P, Choi
31  Cooper
    Francisco
    Gibson
32  Hathway, Robins, Sembler
    Howey
    Jackson
33  G, Johnson
    S, Johnson
    Jones
34  Kado
    Kerndt
    Khalifa
35  Larson, Stuart-Willis,
    Nicholls
    Loker
    Marquez
36  Martini
    Mete
    Murray
37  Nathan
    Oliveira, Moore
    Olroyd
38  Ovideo, Burbano
    Rear
    Sarangam
39  Schachtner
    Schwartz
    Spathas
40  Tan
    Taylor
41  Nguyen, Witkop,
    White
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