

ABSTRACTS (alphabetical order)

Tiarrá Abell '12, Alicia Orkisz '10, and Navpaul Sidhu '10

Leslie Hill, Politics

United States Involvement in Somalia

Somalia's civil war was the breaking point of complex and volatile tensions that have plagued the country throughout its history. The conflict generated international concern and response, particularly from the United States. We focus on the motivations and goals of United States in Somalia from the civil war to the present, and the U.S. impact on the country. This study was undertaken in INDS 100, African Perspectives on Justice, Human Rights and Renewal.

Mariam Alam '10

Karen Palin, Biology

Development of Culturally Appropriate Symbolic Prescription Labels for the Somali Community of Lewiston, ME

Research conducted in Biology s39, Community-Based Research in Biology, shows that members of the local Somali immigrant and refugee community demonstrate difficulty in comprehending and adhering to prescription medication instructions due to language differences and low functional and health literacy. Patient misunderstanding of prescription labels can have disastrous effects, including the potential for dangerous drug interactions and patients' failure to complete treatments. Partnering with B Street Health Center and Bedard Pharmacy, I seek to improve patient comprehension of and adherence to medication instructions by developing culturally appropriate pictograms for use with prescription labels. The developed pictograms are intended to assist pharmacists in conveying information to patients and to serve as an explanatory tool for patients in their homes. Pictorial images denoting typical medication instructions were tested for their effectiveness at improving patient understanding through workshops and home-visit interviews with local Somali women, with the aid of a cultural broker. Data was analyzed for significance using SPSS.

Karl Alexander '12, Obichukwu Udeh '12, and Louis

Watanabe '12

Elizabeth Eames, Anthropology

The Oil Crisis in Nigeria and its Impact on the Nigerian Population

We studied the oil crisis in the Niger Delta and its impact on human rights in the region, addressing four main questions: Which and whose human rights are being violated by the oil companies? What is being done to stop the violations of these human rights? What role do political activists play in the region? How do players outside of Nigeria impact this situation? This study was undertaken in INDS 100, African Perspectives on Justice, Human Rights and Renewal.

Alumni Nancy Audet '96, Rachel Cohen '94, Shaheen Nazerli '06, Susanne Salkind '90, and Jordan Williams '07

Rebecca Herzig, Women and Gender Studies

Celebrating Twenty Years of Studying Women and Gender at Bates

Since its founding in 1990, the Program in Women and Gender Studies at Bates has grown into a flourishing interdisciplinary program, including a popular major and minor and contributing to two General Education concentrations. To celebrate the program's twentieth anniversary, five former students return to

Bates to reflect on the continuing connections between their studies of women and gender at Bates and their subsequent contributions to health care, education, human rights, and social justice.

Rebecca Andersen '12 and Brendan Culliton '12

John Corrie, Music

Technos International Week in Japan

Technos International Week is a two-week program that sends students and faculty from colleges around the globe to Japan to study and experience Japanese culture in order to facilitate cultural exchange. Students Brendan Culliton '12 and Casey Anderson '12 and faculty advisor John Corrie attended the 2009 Technos International Week. They will share their experiences with the Bates community and encourage other Bates members to apply to participate in the program. An illustrated talk will include the highlights of their trip.

Victor Babatunde '11

Pamela Baker, Biology

Exosome as a Tool to Search for Ovarian Cancer Stem Cell Biomarker

Exosomes are membrane-derived (50-100nm) micro-vesicles (MVs) secreted by normal cells and also by tumor cells into the extracellular environment. Exosomes could mediate intercellular communication via exchange of molecules. We sought to isolate the exosomes and extracellular proteins released by the human ovarian cancer cell line: Ovar3, Ovar5, A2780, and ovarian cancer stem cells. Exosomes were isolated through sequential ultracentrifugation from cell culture media. Extracellular proteins from the culture media were concentrated using 10kDa cut-off filter. Scanning and transmission electron micrographs showed the presence of exosomes as round-shaped MVs of homogenous size distribution (~100nm). Gel electrophoresis showed different protein banding patterns between exosomes and secreted proteins from the same cell line and also between different cell lines. Further experiments including mass spectrometry will lead to a complete proteomic characterization of ovarian cancer-derived exosomes and secreted proteins that could be used to develop more sensitive and specific biomarkers for the screening of ovarian cancer. This research was conducted at Memorial Sloan Kettering Cancer Center, NY, under the direction of Dr. Malcolm A.S. Moore, Head of Moore Lab.

Brianna Bakow '10

Kathryn Low, Psychology

Ukuthwasa: A Culture-Specific Syndrome?

This study investigates *ukuthwasa*, a South African phenomenon of dysfunction believed to be the calling to become a *sangoma*, a type of traditional healer similar to a diagnostician. In Western medicine, *ukuthwasa* is considered a mental disorder. Unstructured interviews were conducted with a participant sample comprised of South African Western mental health professionals, *izangoma* (plural of *sangoma*), and educated native South Africans living in and around the Durban metropolitan area (N=13). Based on the interview data, there is a strong association between the symptoms of *ukuthwasa* and selected disorders such as schizophrenia and depression. However, the course of *ukuthwasa* differs from that of Western illnesses, suggesting cultural determinants of outcomes.

Caroline Barr '11

Stephen Sawyer, Off-Campus Study Program

Comparative Ecology and Conservation Program in Ecuador

I studied abroad during the Fall of 2009 on the SIT Comparative Ecology and Conservation program in Ecuador. As part of the program I completed an independent research project in which I evaluated the characteristics of four sites in the cloud forest where spectacled bears had been feeding between August and October in an attempt to discover why the bears feed more often in certain places. I made four 30 m x 30 m plots, one at each site, and measured the diameter at breast height of all trees, the density of the understory vegetation, and the percentage of light that penetrated the canopy in each plot. I found that there is not one characteristic that can be used to predict where a bear will feed and that it is a combination of factors that makes one feeding site more desirable than another. This information will be used by my project advisor as part of his master's thesis in ecology.

Mohammed Basij-Rasikh '12, Mert Karakus '11, and Leena Nasser '12

Eric Hooglund, Politics

Gender under Islamic Law

In this panel students discuss the different approaches to gender under Islamic law and perspective. The three approaches include the Islamic secular approach from governments such as France and Turkey; the Islamic radical approach from governments like Afghanistan and Saudi Arabia; and the moderate approach from the Islamic feminists and Islamic critical theorists' point of view. How does prohibiting women from wearing the head scarf in public arenas in France and Turkey affect Muslim women? How do radical Islamic countries like Afghanistan and Saudi Arabia justify the enforcement of complete covering of the body for women under Islamic law, and how do they justify the prohibition for women to drive, have equal access to education, and equal job opportunities as men do under "Islamic law"? How do Muslim feminists and critical theorists reinterpret the Quran, and argue using the sacred text that Islam has not been implemented correctly under "Islamic" governments?

Julia Bedell '10

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Shifts in the Sand: Mapping Fire Island's Erosion

Fire Island, a barrier island separated from southern Long Island by the Long Island Sound, has experienced continual erosion over the past one hundred years and as an earth form is gradually moving north toward the mainland. This project examines the island's current land mass in comparison with data from over the past few decades to develop a model for the erosion pattern. The project's second component compares data for the island's piping plover (*Charadris melodus*) population with land change data to find possible correlations between the changes in the land and the birds' population decline. Variables include increased human population, land cover change, and sea-level rise.

John Berry '10

John Kelsey, Psychology

The Effects of Electrolytic Lesions of the Nucleus Accumbens Core on Nicotine-Induced Conditioned Taste Aversion

Drugs of abuse are rewarding in large part because they increase dopamine (DA) levels in the nucleus accumbens (NAc). Surprisingly, drugs of abuse can also have aversive effects and that some of these aversive effects may also be mediated by DA in the NAc. Recent evidence suggests, however, that the aversive and rewarding effects may be anatomically segregated within the NAc. In particular, it has been suggested that while the rewarding effects are mediated by the NAc shell, the aversive effects may be mediated by the NAc core. To further examine this hypothesis, I plan to determine if electrolytic lesions of the NAc core in rats will reduce the conditioned taste aversion that occurs when a novel flavor is paired with injections of nicotine. Thus, this study will attempt to provide further insight into the possibly functionally distinct regions of the nucleus accumbens in mediating the effects of addictive drugs.

**Shana Bilech '10, Hannah Davidoff '10, Molly Dilworth '10
Leslie Hill, Politics*****The African Union Convention on Internally Displaced Persons and the Proposed Standards of International Human Rights***

This poster examines the efforts of the African Union Convention on Internally Displaced Persons (IDPs), which convened in October 2009. The convention is the first movement to legally bind an entire region on issues related to preventing mass displacement of people and addressing the vulnerability and needs of those who have been displaced. We explore the outcomes of the convention and its implications for IDPs in Africa. This study was undertaken in INDS 100, African Perspectives on Justice, Human Rights and Renewal.

John Bladon '10

Nancy Kleckner, Biology

Locating Buccal Ganglion Neurons that Have Processes that Traverse the Esophageal Trunks through Nerve Back-Filling with Intracellular Tracers

Feeding behavior in *Helisoma trivolvis* is controlled in part by cells in the buccal ganglia, some of which send processes through the buccal nerves to communicate with the buccal mass. Three distinct groups of interneurons that reciprocally oscillate have been found in the buccals, and have been collectively identified as the central pattern generator (CPG) controlling feeding behavior. Each of these CPG groups drive one stage of the triphasic forward and back motion in which a toothed odontophore scrapes substrates and deposits food particles in the opening of the esophagus. Some of these interneurons have processes that traverse the esophageal trunks. However, it is postulated that other groups of sensory neurons that have a modulatory role on the CPG have more connections through the esophageal trunks. One recently discovered cluster of neurons that may have a modulatory role on this buccal CPG is the buccal A cluster (BAC). To better understand the role of these BAC cells in feeding related behaviors, and of other modulatory cells in the buccal ganglia, it is important to learn the connectivity of all cells in the buccal ganglia. Limited research has been done to categorize feeding related cells in the buccal ganglia by the morphology of their processes. One buccal nerve

will be filled through the distal end with the fluorescent dye Lucifer Yellow in order to dye all cells that send processes through that nerve. This will help determine the specific connectivity of dyed neurons and their potential roles in feeding in *H. trivoltis*.

Lindsay Blitstein '12, Caylin Carbonell '12, and Edward Wells '13

Elizabeth Eames, Anthropology

The Impacts of Tourism on the Economy of Tanzania

Tourism has played a beneficial role in developing the local and national economy in Tanzania. Masai people have been greatly impacted by the developing role of tourism. What does globalization and tourism mean for the indigenous peoples? In Tanzania the Masai have adapted to tourism and experience the impact of international influence on a daily basis. How is Masai culture being affected, and how do the Masai maintain their traditional values while adhering to Tanzania's decision to adopt tourism as a main vehicle of economic growth? This study was undertaken in INDS 100, African Perspectives on Justice, Human Rights and Renewal.

Adam Blythe '10

Todd Kahan, Psychology

The Negative Priming Effect: Inhibition or Episodic Retrieval

When people are asked to respond to an object that had just previously been ignored responses are slowed relative to situations where people respond to an object that had not just been ignored. This finding is often referred to as negative priming. There are two major theories which account for this negative priming effect -- an inhibition based theory and an episodic retrieval theory. In prior attempts to test these theories the familiarity of the target and distractor were not equated by researchers and as such, critics have dismissed the results of these studies. The current experiment equated the familiarity of repeated targets and distractors that enables proper testing of these theories. 40 participants completed the task. Implications of the data for theories of negative priming are discussed.

Henry Bodkin '10

Hilmar Jensen, History

Thesis on Blackface Minstrelsy

Blackface minstrelsy is important to study because of how it defined American identity as well as American Whiteness and Blackness. I examine three different stages of blackface minstrelsy, hailed by historians as the first form of American popular culture. In stage 1, working-class Irish Americans used minstrelsy to parody their Black subjects and thus affirm their own White American identity. But contrary to blackface's sinister, racist legacy, it was also, to a limited degree, as a means of Black-Irish cultural exchange. Also, some of the best known Irish American minstrels, like Stephen Foster, used the art form to express pro-Black and abolitionist sentiments. In stage 2, from the end of the Civil War, to the turn of the twentieth century, minstrelsy became "integrated" as Black troupes were accepted into the industry. This strange cultural phenomenon wherein Black performers painted their faces black and contributed to an entertainment form based largely on anti-Black caricature is complex and difficult to comprehend in current times. But before the Civil Rights Movement, minstrelsy actually provided one of the few ways that Blacks could achieve financial success. Furthermore, some Blacks used minstrelsy to

humanize Black social stereotypes and to expand opportunities for Black artists in theater. In stage 3, Eastern European Jewish immigrants used minstrelsy to Americanize themselves at the turn of the twentieth century, much in the same way that Irish immigrants had in the first half of the nineteenth century. Whether Jewish American minstrels intentionally parodied Blacks as a way to affirm their own Whiteness or whether minstrelsy provided a means for Jews to identify with another American subgroup with a similar history of suffering is hotly debated among cultural historians. The relations among Jews and Blacks within the minstrel industry provides important insight into this issue.

Bridget Brewer '11

Stephen Sawyer, Off-Campus Study Program

Tribal Tattooing in Western India

In fall 2009 I studied in the South India Term Abroad (SITA) Program in Madurai, Tamil Nadu. During my time in India, I received a Barlow Enrichment Grant to research tribal tattooing in Western India, an area of the subcontinent known for its high population of tribal peoples. After my abroad program, I traveled for three weeks, conducting research, interviews, and attending *adivasi* (tribal) festivals. I decided to study tribal tattooing for a variety of reasons. I have always been fascinated by tattoos and the roles they play according to different societies. *Adivasis* are not considered part of the caste system, and the effects this categorization has on their role within modern Indian society fascinated me. The injustices that also accompany existence outside the caste system inspired me to learn more about the topic. Finally, the tattoo in tribal communities is a dying art, and I wanted to document the beauty, grace, and devotion of this practice interviewed academic experts at various Indian universities and institutions, and tribal peoples. Little academic research on tattooing practices has been undertaken, and the language barrier was also rather difficult. My three weeks of research revealed to me that tattoos in *adivasi* communities contain hundreds of meanings, from clan markings to addresses (for those who are illiterate) to names of family members. This is largely a religious practice: the *adivasis* I observed stated that tattoos are the only things that stay with one's body after one's death. Tattoos remind the gods of who the deceased are, and even serve as offerings.

Charlotte Brill '10

Kathryn Low, Psychology

Exploring the Role of Platonic Cross-sex Friendship in an Alcohol-related Rape Scenario and in Alcohol Myopia

The relationship between alcohol consumption and sexual assault has not yet been examined in the context of college students' casual sexual relationships with their cross-sex friends. Previous research on alcohol intoxication and sexual assault between brief or romantic acquaintances has frequently drawn on alcohol myopia theory (AMT). AMT suggests that alcohol impairs the processing of environmental behavioral cues, such that an intoxicated individual only attends to disinhibitory behavioral cues and lacks the cognitive resources to process subsequent inhibitory behavioral cues. Interestingly, AMT research has demonstrated that alcohol may also act as a behavioral inhibitor: when intoxicated individuals receive the fear-provoking cue of a risky behavior's negative consequences, they are less likely to endorse that behavior. This experiment

expanded previous AMT research by exploring the effects of expected and actual alcohol consumption on perceptions of when a man should stop his sexual advances and of a woman's sexual arousal in a rape scenario featuring cross-sex platonic friends. It also examined the impact of both social intimacy and sexual history on responses to such a scenario. Implications for these findings include a broader view of the interpersonal and situational factors that contribute to alcohol-related rape.

William Brunnquell '10

Karen Melvin, History

The Ever-Present Power: U.S. intervention in Bolivian Tin-Mine Nationalization Policy

The victory of the National Revolutionary Movement (MNR) in the Bolivian national revolution of 1952 cultivated hope within Bolivia that the country, long entrapped in a mineral-based export economy, would escape the liberal economic policies which had hampered development. The MNR advocated expropriation and nationalization of the tin-mining industry, the nation's most important resource, but in working toward this goal the MNR confronted U.S. foreign policy in the height of McCarthyism. The United States, fearing a foothold of communism and socialism in the hemisphere, vehemently opposed expropriation of Bolivia's strategically valuable tin industry. This work examines the role of the United States in shaping Bolivian nationalization policy following the revolution of 1952, arguing that it was significantly altered by U.S. economic and political coercion. Exploiting the fractured political composition of the MNR party, the United States compelled the fledgling Bolivian regime to enact a weakened policy of nationalization which allowed for the defense of North American economic and political interests in region.

Emma Bystrom '10

Karen Palin, Biology

Effect of Cranberry, Blueberry, and Lingonberry Juice on Growth of Staphylococcus saprophyticus

Urinary tract infections (UTI) in women are among the most common bacterial infections in humans. Annually, approximately 13 million women in the United States report having UTI. UTI occur due to growth of uropathogens, possibly as biofilms, in the otherwise sterile urinary tract. *Staphylococcus saprophyticus* disproportionately affects young women and accounts for 5-15% of UTI. Due to the increasing antibiotic resistance among uropathogens, alternative treatments for UTI are being explored. This thesis focuses on the effects of cranberry, blueberry, and lingonberry juice on the growth of the uropathogen *S. saprophyticus* in vitro. Preliminary results have shown that cranberry and blueberry juice have inhibitory effects on bacterial growth. Scanning electron microscopy (SEM) was used to visualize biofilm formation and the inhibitory effect of the juices.

Stephanie Cabot '11, Uriel Gonzalez '11, Cambria Hempton '11, and Rebecca Waldo '11

David Das, Off-Campus Study Program

The International Lens: The Art and Ethics of Photography Abroad

Student photographers who participated in study-abroad programs in the Czech Republic (Cabot), Ecuador (Waldo), Italy (Hempton), and Russia (Gonzalez) discuss the ethical, artistic and cultural challenges they faced while taking photographs

abroad. The panelists will illustrate their talks with a selection of their photos. Phyllis Graber Jensen, a photojournalist and the Bates official photographer, and Lincoln Benedict '09, a professional photographer and videographer, will serve as respondents. The panel is presented in conjunction with the 10th Annual Barlow Off-Campus Study Photography Exhibition.

Julia Caffrey '10

Loring Danforth, Anthropology

Modern-Day Samurai or the Dog of Society? Masculinity in Popular Representations of the Japanese Salaryman, 1994-2010

Salarymen, Japanese white-collar corporate businessmen, received widespread credit for the booming success of "Japan, Inc." from the post-war period. Since the collapse of the economic "bubble" in the early 1990s, however, a period of sustained recession followed. Meanwhile, international pressure and a shockingly low birthrate pushed Japan toward a "Gender-Equal Society" initiative. As a result, the institutions that supported the salaryman as a cultural identity and dominant form of masculinity were dramatically altered. Using an interpretive approach to the anthropology of gender, I analyze popular representations of salarymen in satirical songs, poetry, and graphic novels to understand how this historically situated form of masculinity has shifted in response to social and economic change. I explore changes in models for success for young salarymen and analyze contestations of men's domestic role in order to interpret what the persistence of this male institution suggests for Japan's pursuit of a "Gender-Equal Society."

Caylin Carbonell '12

Elizabeth Eames, Anthropology

The Impacts of Tourism on the Economy of Tanzania -- see

Lindsay Blitstein '12 for abstract

Anne Carlton '10

Rebecca Sommer, Biology

Developmental Arsenic Exposure Causes Sexually Dimorphic Alterations in Body Weight, Liver Histology, Blood Glucose, and Global DNA Methylation

Arsenic is abundant in the granite bedrock underlying eastern New Hampshire and western Maine. Wells drilled into arsenic containing rock often contain arsenic concentrations above the Environmental Protection Agency and World Health Organization limit of 10 ppb in drinking water. Arsenic in drinking water, at high concentrations (above 300 ppb) is of significant concern: it has been classified as a group I carcinogen by the International Agency for Research on Cancer and has been associated with cardiovascular disease and type II diabetes. While much is known about the effects of arsenic at high concentrations, less is known about low-dose arsenic exposure. Additionally, the mechanisms underlying the effects of arsenic are unclear. We are investigating the physiological and molecular effects of developmental exposures to low-dose arsenic (50 or 500 ppb) in mice. Preliminary data indicate that developmental arsenic exposure causes liver inflammation in adulthood in female but not male mice. Additionally, developmental arsenic exposure appears to increase blood glucose levels in adult males but not females. Alterations in gene expression, resulting from differences in DNA methylation, may explain these physiological observations.

Currently we are investigating possible alterations in global DNA methylation in adulthood following arsenic exposure.

Leah Carr '10

Nancy Koven, Psychology

The Neurogenetic Basis of Alexithymia and Executive Dysfunction: The DAT1 Gene

Alexithymia, a multifaceted trait, is marked by the reduced capacity to identify, distinguish, and describe emotions. Although not a unique clinical syndrome per se, alexithymia has been implicated as a risk factor for numerous medical and psychiatric conditions. Previous studies indicate frontal lobe impairment in alexithymia, suggesting weaknesses in executive functions such as abstract thinking, creativity, and cognitive flexibility. Little is known about the genetic contributions to the cognitive components and emotion dysregulation in the alexithymic population. With dopaminergic innervation in the frontal lobe, the present study seeks to examine the possible relationships between the genetic basis of dopamine, alexithymia, and cognition. This study looks at an unselected sample of community participants who completed self-report measures of alexithymia, a broadband measure of executive functioning (BRIEF-A), a variety of neuropsychological measures of executive functioning, and who were assessed for the 40 base-pair variable number of tandem repeat (VNTR) polymorphism of the dopamine transporter gene (DAT1). In examining participants with the 9/10 genotype (n=53) and 10/10 genotype (n=61), results suggest a significant role of DA in aspects of cognitive and emotional functioning within the mesocortical pathway.

Elizabeth Casline '10

Sonya Kahlenberg, Biology

The Function of Non-Offspring Infant Carrying in Kanyawara Chimpanzees (Pan troglodytes schweinfurthii)

Alloparenting -- individuals caring for another's off-spring -- is common in mammals and throughout the Order Primates. Alloparenting ranges from energetically expensive acts to less costly ones, including infant carrying. Historically considered an altruistic behavior, research has found alloparenting to be mutually beneficial. Wild chimpanzees occasionally carry non-offspring infants, but little study of this rare behavior leaves its adaptive significance unclear. In order to assess its role, we studied infant carrying in Kanyawara chimpanzees (Kibale National Park, Uganda). Infants were primarily carried by subadults, although adults also carried. Both sexes carried infants at similar rates, but the patterning of the behavior suggests different functions exist. Only subadult and nulliparous adult females carried infants, providing support for the "learning-to-mother" hypothesis, while precluding female reproductive competition. Although no bias existed in infant choice by females, males preferentially carried male infants. As males chimpanzees are philopatric, we suggest male carrying reflects future social bond investment.

Thomas Chapman '10

Francisca López, Spanish

Andalucía, Its Identity and the Speech that Defines It

In 1980, Andalucía, the region most emblematic of stereotypical Spanish culture, became the only region apart from Catalonia, the Basque Country, and Galicia to accede to the newly created Spanish constitution by way of Article 151, a special

provisionary clause which allowed regions with exceptional "historic, cultural, or economic characteristics" to expedite the path to autonomy and self-government. Fascinatingly, the three regions apart from Andalucía used their regional languages as the basis for this special maneuver, as did Andalucía, despite the fact that it can claim no unique regional language distinct from Spanish. What it does have is its own dialect, *el andaluz*. In the process of acceding to the constitution through this special article, the southerly dialect of Spanish took on special significance for the region, transcending decades of disparaging stereotypes and re-inventing itself as a unifying force within the Andalusian community. This sociolinguistic thesis examines the way that the regional dialect diverges from normative Spanish and serves as the representative marker of Andalusian identity.

Anna-Frances Chase '10, Theresa Dokus '10, Emily Grady '10, Julia Lee '10, and Lillian Sheridan '10

Holly Lasagna, Harvard Center for Community Partnerships Collaborating on a Community Food Assessment: Unraveling Hunger and Food Justice in Lewiston

Within the past year, dialogues around hunger, community food security, and sustainable, local food systems converged, and community food work within Lewiston entered a new phase. The Community Food Assessment (CFA), a collaborative project looking at how hunger and food insecurity are manifested in Lewiston, was launched in the summer of 2009, and by the summer of 2010, the data collected throughout the assessment will provide a platform for developing creative, inclusive and multifaceted solutions to these issues. During the 2009-2010 school year, several courses and senior thesis students worked closely with the CFA to gather and analyze data, and support the CFA in other logistical functions. This panel consists of students who were part of these courses or are writing their theses on Lewiston's community food work. The panelists will discuss their findings, present highlights from the larger assessment, and reflect on their experience partaking in a collaborative, community project.

Chester Chiao '13

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Mapping Safe Landing Zones at Yosemite National Park

Every year, nearly three and a half million people visit Yosemite National Park to enjoy the great outdoors. However, some may face the problem of being lost and injured in the rugged backcountry. When this happens, the Yosemite Search and Rescue team (YOSAR) is called into action. These rescue missions often require YOSAR to transport patients quickly. One way to extract victims from the backcountry rapidly is by helicopter. When helicopter becomes the primary means of transportation, a safe landing zone is needed. This project maps safe landing zones according to local protocols using GIS. These sites are mapped to recreational zones so that YOSAR can use the nearest site during rescues, thereby reducing the time needed to extract injured people from the backcountry. Finally, they are linked to nearest hospitals in Mariposa County of California.

Cora Chisholm '10

Thomas Wenzel, Chemistry

Cationic Cyclodextrins, Derivatized Cyclofructans, and (+)-(18-Crown-6)-2,3,11,12-tetracarboxylic Acid as Chiral Solvating Agents in NMR Spectroscopy

Cationic cyclodextrin compounds were synthesized by reacting glycidyltrimethylammonium chloride with α -cyclodextrin, β -cyclodextrin, and γ -cyclodextrin. Their effectiveness as chiral nuclear magnetic resonance (NMR) solvating agents for water-soluble, aromatic-containing, sodium carboxylate salts was determined. These substrates form host-guest complexes with the cyclodextrin compounds. This complexation is confirmed by the upfield shift in the proton resonances of the substrates. The extent of enantiomeric discrimination was found to be dependent on the size of the substrate and of the cyclodextrin compound. Additional studies were conducted to test the effectiveness of native cyclofructan, sulfated cyclofructan, and isopropyl-cyclofructan as chiral NMR solvating agents. These compounds were tested with substrates containing protonated amine groups. All cyclofructan compounds proved to be poor enantiomeric selectors for the substrates tested. Lack of shifting of substrate proton resonances indicates that host-guest complexes are not likely forming. Additional studies were conducted to test the effectiveness of (+)-(18-crown-6)-2,3,11,12-tetracarboxylic acid (18-C-6-TCA) as a chiral NMR solvating agent with cyclic β -amino acids. 18-C-6-TCA was found to be an effective chiral solvating agent for most of the substrates tested.

Classical and Medieval Studies/History 253: Introduction to Roman Law

Margaret Imber, Classical and Medieval Studies

Iudicium! A Mock Trial

Ripped from a lost millennium's headlines! A family conflict that encompassed two provinces, three cities, and several generations of Roman Africa's most powerful families. On Friday, April 2, the feud will culminate in a trial – one party emerges the victor – and it's all down to you. Members of the Mt. David Summit audience will serve as jurors in the lawsuit Sicanus Pudens brings against his stepfather, Apuleius. Who lied, who cheated, who stole? We report, YOU DECIDE.

Kathryn Collier '13, Elizabeth Henry '12, Monthe Kofos '11, and Zachary Kofos '13, and Huong Sutliff '13

Lavina Dhingra, English

Image and Sound: Reading and Writing Lyric Poetry

A student representation from Professor Dhingra's Lyric Poetry class will recite a selection of poetry written in the fall of 2009. Students were inspired by poets ranging from Wordsworth to Ginsburg and writing workshops conducted by visiting poet Susann Pelletier. Please note the influence of prior works through stylistic, tonal, and/or referential subtleties.

Mayur Contractor '10

Nancy Kleckner, Biology

Role of Dorso-Medial Dye Coupled Buccal A Cluster Neurons in the Modulation of the Feeding Central Pattern Generator in the Pond Snail *Helisoma trivolvis*

The feeding behavior of *Helisoma trivolvis* is controlled via a tri-phasic central pattern generator (CPG), a system of neurons that produces recurring motor output through activation of corresponding motor neurons in a network. This pattern can be modified via input from other neurons in the form of electrical

signals, chemical signals, or directly via drug application. A group of neurons in the buccal ganglia of the *H. trivolvis* central nervous system called the buccal A cluster (BAC) is known to play a role in modulating the feeding CPG via activation and inhibition of CPG subunits, resulting in disruption of feeding or regurgitation. This study aims to investigate modulatory characteristics of a dorso-medial group of BAC neurons that have previously shown dye coupling as the result of filling neurons with Neurobiotin tracer. Morphology of dye-injected cells confirms identity of BAC neurons in the target group and intracellular recordings show uni- and bi-directional electrical coupling between BAC neurons as well as unidirectional dye coupling within the target group. Coupling coefficients will be used to determine the magnitude of electrical coupling and pharmacological activation will be used to investigate the role the dorso-medial coupled neurons in feeding CPG modulation.

Brendan Culliton '12

John Corrie, Music

Technos International Week in Japan -- see Rebecca Andersen '12 for abstract

Katherine D'Angelo '11, Micaela Holland '11, and Jorie Ohlson '10

Elizabeth Eames, Anthropology

Ritual Use of Albinos in Tanzania

In the past two years, over 50 albinos have been murdered in Tanzania, a country in which the prevalence of albinism is five times greater than the world average. The murders are connected to ritual practices: the murderers kill these individuals for their body parts, which are believed to bring good fortune when used by witch doctors. This study was undertaken in INDS 100, African Perspectives on Justice, Human Rights and Renewal.

Hannah Davidoff '10

Leslie Hill, Politics

The African Union Convention on Internally Displaced Persons and the Proposed Standards of International Human Rights -- see Shana Bilech '10 for abstract

Sarah Davis '10

Heather Lindkvist, Anthropology

The Role of the Lewiston/Auburn Time Bank in Facilitating the Social Integration of Refugees in Lewiston and Auburn, ME

Time banks are a type of alternative community currency in which members exchange services through the use of "time dollars." Existing research documents time banks' capacity to build social capital and facilitate the social inclusion of disadvantaged populations. In Lewiston/Auburn, ME, a time bank has been established in collaboration with the local refugee resettlement agency, Catholic Charities of Maine, to assist refugees with the challenges of resettlement. Through this thesis, I examine the extent to which the Lewiston/Auburn Time Bank facilitates the social integration of refugees. I consider three elements of social integration: a) providing needed services to refugees, b) valuing refugee skills, and c) building positive, crosscultural relationships between refugees and long-term residents. To do so, I conducted community-based research (CBR) with Catholic Charities and the Lewiston/Auburn Time Bank. Research involved participant observation and semi-structured interviews with time bank members and

administrators. Findings include a discussion of the current characteristics of the Lewiston/Auburn Time Bank and recommendations for improvement.

Nicolas DeFrancis '10

Bonnie Shulman, Mathematics

The Origin of Cooperation: Modeling Behavioral Evolution on Graphs

The well-known mantra of Darwinian selection, "survival of the fittest," leads to disturbing consequences in game theory. The Prisoner's Dilemma (PD) is a game used to model competition over common resources, something that happens constantly in nature. When we model these PD games using evolutionary fitness payoffs, Darwinian selection implies that free-riders (non-cooperators) should outcompete and out-reproduce their cooperative counterparts. Yet we do not see this in nature. Evolutionary game theory and computer simulations are used to explore possible explanations for the existence of cooperative behavior, even in a world dominated by PD-type interactions.

Harita Dharaneeswaran '10

Nancy Kleckner, Biology

Confirmation and Localization of Cotransmitter Buccalin in the Central Neural Network that Underlies the Feeding Behavior of Pond Snails, *Helisoma trivolvis* and *Biomphalaria glabrata*

Buccalin is a neuropeptide that modulates feeding behavior in various marine mollusks such as *Aplysia californica* and *Clione limacina*, in addition to arthropods such as the crab, *Cancer borealis*. However, not much is known about buccalin in the pond snails, *Helisoma trivolvis* and *Biomphalaria glabrata*. Buccalin peptides are predicted to exist in *Biomphalaria* based on a search of the expressed sequences tags (EST) database from the National Center for Biotechnology Information (NCBI). These predicted peptides in *Biomphalaria glabrata* from the EST database were homologous to known *Aplysia* buccalin peptides. In order to validate the presence of these peptides, analytical techniques such as mass spectroscopy, followed by immunocytochemistry and in situ hybridization are performed to identify and localize the site of action of buccalin in *Helisoma* and *Biomphalaria*. Ultimately, this study will facilitate our understanding of the function of buccalin neuropeptides and their physiological roles in feeding-related behaviors in *Helisoma* and *Biomphalaria* and in relation to other mollusks.

Molly Dilworth '10

Leslie Hill, Politics

The African Union Convention on Internally Displaced Persons and the Proposed Standards of International Human Rights -- see Shana Bilech '10 for abstract

Alexandra Disney '10

Pamela Baker, Biology

Sangre de drago: An Antibacterial and Antioxidant Tree Sap
Sangre de drago (Dragon's blood) is a viscous, red sap derived from the tree *Croton lechleri* Muell-Arg. The sap is used by indigenous Amazonian cultures externally and internally for its healing properties, such as the treatment of wounds, insect bites, inflammation, viral infections, diarrhea, stomach ulcers, tumors, and cancer. The sap is said to have antioxidant and antibacterial properties. *Sangre de drago* is extracted from *C. lechleri* by scoring the tree or, more efficiently, by felling the tree.

According to scientists and Ecuadorian natives, the trees are threatened due to increased U.S. pharmaceutical interest and the lack of local reforestation efforts. This biological chemistry thesis is designed to test the sap as an antibacterial agent against certain pathogens, including *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, and *Salmonella typhimurium*. The antioxidant properties of the sap will also be studied and compared to those of Vitamin C. 1H-NMR spectroscopy will be used to determine the sap components. The goal of this study is to shed light on the biological properties of *sangre de drago*, as a means of scientifically analyzing a natural medicine long been in traditional practice.

Theresa Dokus '10

Holly Lasagna, Harvard Center for Community Partnerships
Collaborating on a Community Food Assessment: Unraveling Hunger and Food Justice in Lewiston -- see Anna-Frances Chase '10 for abstract

Vantiel Duncan '10, Alicia Orkisz '10, and Navpaul Sidhu '10

Sue Houchins, African American Studies

Haiti's Quest for Autonomy: Understanding the Sociocultural and Economic Effects through a Brief Survey of Caribbean Literature

The first successful slave revolt against French colonialism established Haiti as an independent nation. Though once "the Jewel" of the French empire, Haiti has struggled to break its colonial chains and establish its own economic and political autonomy. By surveying some Caribbean literary texts, we shed light on Haiti's quest for self-determination through an investigation of religion, economics, and culture. Our presentation is an effort to answer the question: "Why do we know so little about Haiti?" To this end, we recount the history of Haiti's courageous past and the way in which United States and Europe have sabotaged its development. We contend that knowledge of this nation's struggle over the last 200 years gives perspective on Haiti's present situation.

Ronald Ead '12

Margaret Imber, Classical and Medieval Studies

Imperial Protection at the Expense of Senatorial Libertas

How did autocratic figures in the late Roman Republic protect their positions from an often hostile senatorial elite that sought to obstruct their assumption of power, or in the case of the Princes, from those who sought to take the throne for themselves? They could only protect themselves from senatorial opposition by further disempowering the senatorial elite through a reduction of its *libertas*. The two elements of *libertas* that were incompatible with the protection of these autocrats were the senatorial elite's freedom of political speech and its right to protection from arbitrary judgment. In taking away these two elements of the aristocracy's *libertas*, autocrats were able to eliminate at will those who they deemed opponents.

Rachel Eades '10

Emily Kane, Sociology

Bridging the Health Care Gap: How Uninsured, Working Adults Negotiate Health and Illness

According to 2008 U.S. Census data, 46.3 million Americans are living without health insurance. While many are unable to access the care they need, the uninsured are not passive victims

of a broken health care system. Instead, people without health insurance constantly find ways to adapt within and even act back on institutional structures to maintain health for themselves and their families. Using data from 21 qualitative interviews conducted in Maine and New Hampshire, this thesis explores the strategies for health care used by working adults without health insurance. Every day, individuals without health insurance suffer the adverse consequences of their insurance status, but also creatively manage their health needs. This thesis contributes to the conversation on health care reform, giving voice to the lived experiences of Americans without health insurance.

Emily Egan '13

Patricia Buck, Education

The Achievement Gap

At the core of the American psyche is the belief that citizens with a strong work ethic and perseverance can overcome the disadvantage of wealth, background, or class. Yet current empirical data documents an achievement gap, which indicates the disparity in academic performance between poor, minority students, and white students from all income brackets. Many minority students must overcome three significant barriers to attain educational excellence: poverty, a language gap, and institutionalized racism. Thus, ethnically diverse students score lower than Caucasian counterparts on standardized tests due to external factors. For instance, schools are funded by local property taxes, which results in a two-tiered educational system because underfunded city schools cannot compete with more affluent suburban schools. Education reform on the national and state level must responsibly redistribute funds to provide all children an equal education experience. Exploring the socioeconomic forces behind the quantitative numbers reveals opportunities to close the gap.

Kate Eisenpress '10

Julie Rabinowitz, Rhetoric

How Conservative Media Derailed Liberal Health Care

President Barack Obama, the first African-American to hold that office, promised to issue in a new era of politics, one that values bipartisan pragmatism above partisan pettiness. However, in the first year of his presidency, partisan politics continued to rule the legislative process in Washington D.C. The debate surrounding the passage of the cornerstone policy of his administration, health care reform, has been mired in partisan debate. During these deliberations, both conservative and liberal figures have attempted to persuade voters of the wrongfulness or the rightfulness of such a bill. Overall, conservative media personalities have been more successful than liberals in arguing against reform, by changing the terms of the debate. Through the use of metaphorical analysis, this thesis examines the use of the metaphor of "death panels" within the health care debate as an example of conservatives' ability to sway voters through deep-value frames, and develops an understanding about the liberals' failure to popularize their own agenda (Lakoff and Johnson, 1980). By naming, framing, and changing the debate through metaphor, conservatives have boasted of their comparative success, which exemplifies the power of metaphor to alter and affect public opinion (Steen, 2008).

Elizabeth Ellman '10

Krista Scottham, Psychology

The Effect of Extended Contact on Reducing Prejudice in Children

Arrival of Somali refugees in Maine has been met with mixed reactions, including tensions involving local youth. To help mitigate this, it is important to examine how prejudice can be reduced. Extended contact is a successful technique for reducing prejudice. Previous research has shown that providing preliminary support for extended contact is an effective tool for reducing prejudice toward minority groups, but those studies have focused on interventions framed around discussions of published books. The current project creates books that function independently as the manipulation for prejudice reduction directed toward both minority and majority groups. To assess their validity, the books were provided to 25 third graders, measuring whether they convey the desired messages. It was found that the books successfully conveyed the intended message. These books are integral to assessing prejudice reduction through the larger extended contact study this fall and will provide the basis for interventions targeting prejudice reduction.

Ethan Emerson '12

Joshua Henry, Chemistry

IR Spectroscopy of Alkyl Phosphines

We are currently examining the stretching wavenumbers of tributylphosphine oxide (TBPO) to establish the dependence of P = O stretching frequency on concentration through infrared spectroscopy. It is known that a linear relationship exists between triethylphosphine oxide (TEPO) and concentration. TEPO is also known to have a linear relationship between solvent acceptor numbers and stretching wavenumbers. Our goal is a more complete understanding of the vibrational spectra of alkyl phosphine oxides because of their importance in the surface chemistry of cadmium selenide nanocrystals. Our approach is to carefully examine the differences between TBPO's spectrum and other trialkylphosphine oxides, so that we may be able to attribute the differences in spectra to differences in the compounds. Initial results show significant differences between the spectra to TBPO and trioctylphosphine oxide (TOPO) attributable to both concentration and molecular structure effects.

Kate Fetrow '13

Sylvia Federico, English

Male Dominance in Courtly Love in "The Saga of the Mantle" and "Lanval"

This presentation discusses of the portrayal of courtly love and male dominance in Arthurian texts, in particular the anonymous the "Saga of the Mantle" and Marie de France's "Lanval." I argue that the texts present males as dominant in courtly love, contrary to initial appearances and popular perception

Jenna Finegold '10

Michael Sargent, Psychology

The Perception of Sanctioned Bias and Its Effect on Hiring Decisions

Previous research indicates that when individuals make hiring and admission decisions, their standards of excellence tend to shift based on the applicant's social category. Some researchers

have discovered that an effective way to counter individuals' demonstration of biases is to ask them to express the qualifications that they believe are important for their decision before viewing any applicant's resume. However, other research has not replicated this finding. The current study attempts to determine if individuals' beliefs about how sanctioned a bias is plays a principal role in whether or not their precommitting to criteria is effective at reducing discrimination. 320 participants (160 males and 160 females) of a variety of ages and from multiple locations, were recruited to complete an online survey. Participants believe that a bias is either sanctioned or prohibited, precommit to criteria or will not, and read about either a male or a female applicant. A 3-way ANOVA is run to analyze interactions among the three manipulations. The findings of this study could prove useful in helping to eliminate hiring discrimination.

Alyeska Fiorillo '10

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Historical Land Changes of Lake Sunapee, NH

Lake Sunapee, in central New Hampshire, USA, is a large oligotrophic lake that is showing signs of eutrophication. Used as a water source by the local residents and for recreational activities it is important to understand where these ecological changes are stemming from. The goal of this project is to analyze historical and current data using GIS to try and understand how changes in the landscape have affected the connected watershed. Layers of historical data including land cover types, vegetation, road construction, and urban development were used to reconstruct an historical image of Lake Sunapee that can be compared to current data layers. Two maps were made using the following GIS data layers for the Sunapee, NH, area: roads, streams, watershed, land cover, vegetation, population, digital elevation models, slope, and soil types. By combining these data layers we can compare how land cover and urbanization have changed over time in the Lake Sunapee area and potentially impacted the water body.

Jillian Fogarty '10, Benjamin Gaffney '10, and Kira Kramlich '10

Leslie Hill, Politics

The Issues behind the Civil War in Somalia and the Road to Renewal

This poster examines the civil war in Somalia, the events that propelled it, and its impact. We consider the story of the country's road to renewal as it struggles to find peace. The state of Somalia today is detailed in light of these struggles. This study was undertaken in INDS 100, African Perspectives on Justice, Human Rights and Renewal.

Jillian Fogarty '10

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Colonization's Effects on African Trade Routes

The purpose of my project is to present the effects former African trade routes may have had on current natural resource abundance, disease prevalence, and other indicators of economic prosperity in the regions subjected to the colonization that depended on these trade routes. I address this question by using GIS to compare the regions around past trade routes with the contemporary maps showing the current economies, disease, and

natural resource distribution across these regions. My data of trade routes comes from a database compiled by researchers at the Kennedy School, Harvard University, and data from Relief Web, the United Nations, and Brown University.

Alison Frye '10

Sonya Kahlenberg, Biology

The Effect of Teacher Education on Students' Environmental Knowledge in Primary Schools near Kibale National Park, Uganda

Kibale National Park (KNP) in Uganda contains abundant biodiversity essential to the local ecology and wellness of the planet. This forest habitat, however, is being degraded due to human activities. The Kasiisi Project aims to combat this threat through conservation education in primary schools neighboring KNP. A current Kasiisi educational initiative involved taking teachers on wildlife tours of KNP and a savannah habitat. Environmental knowledge and motivation to teach about conservation increased in teachers after these trips. This study evaluated whether teacher improvements influenced the environmental knowledge of students. Students were assessed through their drawings of KNP and savannah wildlife completed before and after teacher trips. Student drawings reflected basic habitat differences and results showed more correct animals were drawn after teacher trips. These findings indicate that teacher-focused education effectively spreads to students. Future research is necessary to evaluate whether increased knowledge translates to changes in detrimental activities around KNP.

Catherine Frye '13

Paula Schlax, Chemistry

Epidemics at Bates College

During this past year's severe outbreak of H1N1 on the Bates College campus, several extreme actions were taken including vaccination and quarantine. One was left to consider how our forefathers would have approached this same kind of epidemic, or if they ever had to. By using primary sources from Bates's own Student and Annual Reports, I have created a timeline illustrating the history of epidemics at Bates College. Walking through the 160 years since Bates's inception, this project looks at how health played into the existence of this college community. Trends of change in the areas of technology, privacy laws, and business decisions have all given insight into how the reactions toward illness have changed, and remained the same, over the years.

Benjamin Gaffney '10

Leslie Hill, Politics

The Issues behind the Civil War in Somalia and the Road to Renewal -- see Jillian Fogarty '10 for abstract

Peter Garber '10

Matthew Côté, Chemistry

Synthesis and Exploration of Plasmonic Nanostructures

In this work we developed metal nanostructures whose plasmonic behavior will enable us to combine the high spatial resolution of scanned probe microscopy with Raman spectroscopy. In particular, we are refining an electrochemical technique for fabricating gold nanorods within track-etched polycarbonate filters. After the electrochemical process, the polycarbonate was dissolved and the rods were dispersed in alcohol. The rods were observed using UV-visible and infrared

spectroscopy as well as atomic force microscopy. These rods are of interest in their own right because they are convenient for studies of plasmon excitation and propagation and also because they may be useful as highly reproducible plasmonic scanned probe microscope tips.

Alexander Garnick '10

Margaret Imber, Classical and Medieval Studies

A Comparison of the Vestal Virgins to Livia Drusilla

I compared the legal status of the Vestal Virgins at the time of the early empire to that of Livia Drusilla. The unique status of the Vestals isolated and raised them above other Roman women. The legal status of the Vestals was one of the only ways the Roman governing powers traditionally knew how to honor and empower women. Augustus, Tiberius, and the Senate empowered Livia with legal privileges shared by the Vestals, because those were the most logical means to honor a woman without overstepping any boundaries. The Vestals also mimicked Livia's status. Livia was the ideal Roman matron, and the status of the Vestals also had matron-like aspects. The relationship between the Vestals and Livia, therefore, was reflexive instead of one-sided.

Briana Gerrish '10

Helen Boucher, Psychology

Effect of Ingroup Identification on Threats to Belief in a Just World

A fundamental hypothesis of belief in a just world (BJW) explains that the awareness of innocent or relatable victims threatens individuals' BJW, especially if the victim is an ingroup member (Aguilar, Vala, Correia & Pereira, 2008). The current study attempted to determine whether participants' identification with their own ingroup moderated the effect of ingroup victims on threats to BJW. There were 120 undergraduate participants in this study, all of whom were self-described as White. Participants completed the White Identity Centrality Implicit Association Test created by Knowles and Peng (2005) to implicitly measure ingroup identification. The participants then read a prompt describing either a White victim (ingroup condition) or a Black victim (outgroup condition) and completed the modified Stroop task created by Hafer (2000) to measure threat to BJW. The predicted findings were that only participants with strong ingroup identities experienced threat to their BJW as a result of an ingroup victim. Implications for these findings included the consequences of ingroup identification and how we form our own scopes of justice.

Cosmin Ghita '12

Áslaug Ásgeirsdóttir, Politics

Investigating Political Apathy in Romanian Youth

The goal of this study was to investigate the causes of political apathy in Romania's youth (18- to 24-year-olds). After recent rampant voting absenteeism and a close to standstill development of civil society (Catalin Augustin Stoican, President of CURS Agency), the question of whether Romania has been affected by the global downward trend of electoral presence; is it suffering from communist inheritance (Rupnick) or are there other overlooked factors influencing this issue? I conducted several in-depth interviews with government officials and members of the local civil society and disseminated a questionnaire to 650 Romanian citizens aged 18-24 that measured the interest in politics but also how much is known

about the basic civic political rights and responsibilities. The research also included analyzing trends in voter turn-out and the development of a civil society. In doing so I cooperated with two Romanian NGOs, the League of Romanian Students Abroad and the Pro-Democracy Association. I identified the lack of political education as the main cause of political apathy in this social category. Campaigns that do not target Romania's youth as well as a negative social image of Romanian associations constitute another reason. The collected data, however, will form the basis of a future independent in-depth study of this problem.

Kelly Gollogly '10

Katherine Mathis, Psychology

How Stereotype Threat is Affected by Gender Identification as Measured by the BSRI

When women perform a complex math activity they risk being judged by the negative stereotype that women have weaker math abilities than men; this is called stereotype threat. The current study looked at the effects of stereotype threat on math performance for female college participants (no male participants were studied) who identified as having high levels of femininity or masculinity. The first portion determined participant's levels of femininity/masculinity using the Bem Sex Role Inventory (BSRI) and self-reported math SAT scores. Portion two examined how participants with high masculinity/low femininity and low masculinity/high femininity were affected by stereotype threat while completing a short GRE math test. The predicted outcome was that females who identified as being high femininity/low masculinity would perform worse on a math exam than females with low femininity/high masculinity when stereotype threat was present, but perform equally when no stereotype threat was present.

Uriel Gonzalez '11

David Das, Off-Campus Study Program

The International Lens: The Art and Ethics of Photography Abroad -- see Stephanie Cabot '11 for abstract

Peter Goodwin '10

Robert Thomas, Biology

Changes in Grass Species Distributions in Sprague Marsh Correlated to Sea-Level Rise

Plant species in tidal salt marshes display typical zonation patterns based on elevation above sea level. The low oxygen associated with twice-daily flooding below mean high water limits the extent of certain grass species. Global climate change has increased rates of relative sea-level rise, causing extensive marsh habitat loss due to flooding in some regions. New England tidal marshes display landward shifts in plant species distribution as a result of the consequent sea-level rise. The extent of these shifts is reflected in differences between relative sea-level rise and vertical marsh growth. This study assessed changes in annual marsh growth rates and species distribution at Sprague Marsh in Bates Morse Mountain Conservation Area, Phippsburg, ME. Twelve marsh peat cores from three transects at this site containing identifiable roots, rhizomes and pollen were analyzed to correlate marsh habitat changes with sea-level rise.

Peter Goodwin '10

J. Dykstra Eusden, Geology, and Camille Parrish,
Environmental Studies

Thirty Years of Change in Vegetation Cover in the Greater Portland Area

Portland, the largest city in Maine, has grown for the last 30 years through exurban development. Exurban development occurs as the surrounding areas increase in size and population, converting previously undeveloped land to residential and commercial areas or roads. In southern Maine this development process involves the clearing of undeveloped land by removing vegetation, typically forest or grass and marshlands along the coast. This process results in patchworks of fragmented vegetation embedded within suburban landscapes. As the surrounding areas are developed for human use, land is cleared of vegetation and replaced with man-made structures that differ from the surrounding vegetation in color and absorbance of infra-red wavelengths. These different reflective properties can be observed through satellite imagery and analyzed using Arc GIS. Using this method, changes in vegetation cover for Portland, Maine can be determined by comparing satellite imagery data taken over the course of 20 years.

Eleanor Gourley '10

Claudia Aberto Guzmán, Spanish

The Discourse of Memory: Representing the Past through Film in Argentina and Chile

Art is an important part of collective memory building. Film, an accessible art form, helps shape the collective memory of an event or a period of time. Chile and Argentina both experienced repressive military dictatorships that came to power in the 1970s, and produced *desaparecidos* -- persons arrested in secret by the state who were tortured or killed. However, different perceptions exist about the dictatorships in both countries. The Argentine dictatorship is remembered as a failure, due to massive human rights violations and an unsuccessful war over the Falkland Islands. Contrarily, Pinochet's dictatorship in Chile was considered "successful;" to this day some Chileans support Pinochet's economic restructuring of Chile, even at the expense of human rights. My presentation analyzes the differing discourses of memory through films in order to shed light on the cultural representations of the dictatorships and the formation of collective memory in each country.

Emily Grady '10

Holly Lasagna, Harvard Center for Community Partnerships
Collaborating on a Community Food Assessment: Unraveling Hunger and Food Justice in Lewiston -- see Anna-Frances Chase '10 for abstract

Munroe Graham '13

Hilmar Jensen, History

Does Your Government Protect Your Freedoms?

This presentation studies the legal curtailment of civil liberties of American citizens by the United States government in the year following the terrorist attacks on September 11, 2001. These curtailments exemplify how the American government, under the guise of the "War on Terror" and national security, violated the Constitution and the Bill of Rights that President George W. Bush and his administration promised to uphold.

Catherine Green '10

Julie Rabinowitz, Rhetoric

America's "Other" Sweetheart: Michelle Obama's Navigation of Intersectionality and the Public/Private Divide as Represented in Political Cartoons

The role of first lady has since its inception been subjected to conflicting expectations. She is ideally a role model of domesticity but is paradoxically expected to shine in the public domain as an accessorial figure to the epitome of American masculinity. Michelle Obama presents an especially intriguing case as the current first lady; on top of merging the public and private spheres, a balancing act inherent in her responsibilities upon entering the White House, she serves as a point of intersectionality between race, gender, and class as a Black woman in one of the most visible roles of unelected, relative power. The American people's reception of the first lady is reflected graphically in the genre of political cartoons, with varied results and consequences. Using Kenneth Burke's rhetorical theory of perspective by incongruity and Medhurst and DeSousa's tools of graphic discourse with a focal point of intersectionality, I examine the representations of Michelle Obama in political cartoons spanning her husband's bid for presidency. In my analysis, I explore the implications of these depictions, whether they truly take into consideration the multifaceted aspects of her public/private persona, and what these representations contribute to the reconciliation of socially constructed identities.

Philip Greengard '10

Shepley Ross, Mathematics

The Dynamical Behavior of $F(z)=z^n+C/z^n$

My research is part of a full-year expository thesis centered around "Singular Perturbations of Complex Analytic Dynamical Systems," a paper by Robert Devaney of Boston University. On display in my presentation are various complex topological spaces created using a computer program in Visual Basic that has been under development for the past two years. Analysis of these topological spaces and theorems surrounding them is also presented.

Eric Grodman '10

Todd Kahan, Psychology

Male Body-Image Dissatisfaction: Increased Feelings of Weakness and Body Discontent Following Failure to a Female on a Task

Research suggests that young men have been becoming more susceptible to pressures for obtaining a muscular body over the past few years. "Threatened masculinity" theory suggests that many men are working out in order to compensate for feelings of perceived weakness that arise from greater female equality in contemporary society. In accordance with this theory, a study by Mills and D'Alfonso (2007) has indicated that men experience greater body dissatisfaction following perceived failure to a female on a competitive task. The current study seeks to determine whether males who perceive failure to a female experience increased body dissatisfaction as a result of feeling cognitively weak. Approximately 60 undergraduate males participated in this study, aged 17 to 22. Participants were given false performance feedback on a cognitive task that is presented on a computer screen. Predicted findings include increased feelings of weakness and greater body dissatisfaction among men who fail to a female. This could provide important

information to those wishing to design an intervention geared toward helping men who exercise excessively.

Christine Grover '10

Susan Langdon, Psychology

The Telling Room: How a Nonprofit Writing Center Affects the Self-Efficacy, Classroom Engagement, and Literacy Skills of Students in an ELL Biology Class at Portland High School, ME

This study looks at the effectiveness of a school-based writing program implemented in an English language learning (ELL) biology course at Portland High School. This program was run by The Telling Room, a nonprofit writing center that works with young people using various kinds of writing and creative expression to enhance their self-confidence and literacy and creative skills to prepare Maine's youth for a successful future. Previous research shows that writing activities can be effective in increasing self-confidence and academic ability and that writing competence can lead to higher intrinsic motivation. This investigation aimed to evaluate the program's effects on students' self-efficacy, classroom engagement, and literacy skills through the use of questionnaires, interviews, classroom observations, and collection of writing samples. Baseline and post-program data were collected. We expect results to support previous findings and demonstrate that The Telling Room's school-based program has a positive impact on the students' self-efficacy, classroom engagement, and literacy skills.

Melanie Harkins '10

Helen Boucher, Psychology

The Moderating Effect of Money on Mortality Salience and Conforming to Worldviews: Is Money Enough?

Terror Management Theory (TMT) and Meaning Maintenance Model (MMM) argue that mortality salience (MS) leads to anxiety and distress, which causes worldview-bolstering responses. The TMT posits that anxiety aroused from thoughts of death causes culturally conforming behaviors (e.g., punitive responses toward a prostitute and harsh judgments towards anti-American beliefs). New findings (Zhou, Vohs, Baumeister, 2009) suggest that money creates a feeling of strength and acts as a buffer toward physical and emotional distress. The current study attempts to determine if money can buffer the anxiety associated with thoughts of death. Approximately 100 undergraduate students (50 female 50 male) participated in this study, which was a 2 (MS: death vs. television) X 2 (materialism: money vs. paper) factorial design. The data were analyzed to determine if money acted as a moderating variable, causing participants to conform to cultural worldviews when presented with paper in comparison to money.

Amelia Harman '10, Anne Smith '10, and Qinglan Wang '10

Robert Farnsworth, English

Poetry Reading

In this poetry reading, three poets will read a selection of their works. This will be concluded by a question-answer session about each poet's individual creative-writing process.

Carolynn Harris '11

Beverly Johnson, Geology

Stable Isotope Analysis of Archeological Bone Samples

Carbon and nitrogen stable isotope levels in archeological and modern samples were analyzed to gain information about the

diet of individual consumers to reconstruct food webs from the Maine coast. Bone samples included a variety of species from several time periods from Turner Farm, a site already well sampled, and from other sites around the Maine coast. Muscle tissue, fin, heart, and liver were analyzed in addition to bone collagen in modern cod and flounder. This information will allow the modern and ancient food webs to be compared. All the bone samples were demineralized in 0.2M HCl and then extracted in 0.25M NaOH to remove the humic acids that accumulate in archeological bone samples. After freeze-drying samples, the bulk isotopic composition was analyzed using the EA-IRMS before and after lipid extraction. The process of demineralizing the bone samples was photographed using an Epson V750 Photo flatbed scanner. The photographs and percent collagen recovered data show that the archeological samples analyzed were well preserved. The stable isotope data for modern cod tissues show that solvent extracted tissues were less enriched in $\delta^{15}\text{N}$ values and that solvent extraction reduced the variation between $\delta^{13}\text{C}$ values.

Whitney Harrison '10

Kathryn Low, Psychology

The Use of Self-Monitoring to Decrease Inappropriate Behaviors in an Academic Setting

The present study used self-monitoring strategies to decrease inappropriate behavior. The participant was a 9-year-old female enrolled in a special-purpose school who frequently exhibited behaviors that were disrupting her learning. The purpose of the study was to decrease such behaviors through self-monitoring techniques such as self-charting and reinforcement.

Lisa Hartung '10, Tahira Khalid '10, Catherine Lary '11, and Nkese Rankine '11

Melinda Plastas, Politics and Women and Gender Studies

Gender Analysis for a Global Era: New Work in Women and Gender Studies

This panel offers transnational perspectives on the working lives of women and men in the twenty-first-century United States. Based on recent thesis or seminar work in Women and Gender Studies, the panelists describe how a gendered lens alters understandings of current K-1 visa regulations, maple sapping, lobstering, and apparel production. This panel and an alumni panel mark the 20th anniversary of the Program in Women and Gender Studies at Bates.

Zachary Harwood '10

Katherine Mathis, Psychology

Sport Fandom and Personality

Research suggests links between both sport-fan motivations and gender, and sport-fan motivations and culture. Furthermore, studies have also shown personality differences are also related to gender. This study analyzed the possible links between gender, personality types, and sport-fan motivations, using personality types (within gender) to predict sport-fan motivations. Additionally, the study examined differences in sport-fan motivations between American and Australian cultures. This study sought to analyze previously unlinked topics from sport psychology and personality psychology.

Cambria Hempton '11

David Das, Off-Campus Study Program

The International Lens: The Art and Ethics of Photography Abroad -- see Stephanie Cabot '11 for abstract

Elizabeth Henry '12

Lavina Dhingra, English

Image and Sound: Reading and Writing Lyric Poetry -- see Kathryn Collier '13 for abstract

Joncarl Hersey '12

Margaret Imber, Classical and Medieval Studies

The Mystery of Acceptable and Unacceptable Magic in Ancient Rome

I examined the ways magic was socially and legally acceptable and unacceptable in ancient Rome. First I investigated the laws concerning magic in the Twelve Tables and Lex Cornelia to establish what was considered unacceptable in the law. Pagan religious practices that included magical components were reviewed to look for clues as to what made these particular magical practices acceptable. Apuleius's "Apologia" was studied to analyze how he defended himself against the charge of practicing magic. Finally Apuleius's novel *The Golden Ass* reveals cultural attitudes toward magic in a more social situation. The review of these materials reveals that the distinction between what was considered acceptable and unacceptable magic is often a nebulous notion dictated by what was popularly accepted and considered a social and religious norm. Of equal consideration in the determination of acceptability is the perception of whether the magic was conducted with malicious or dangerous intent. In many ways, these materials show that it was not magic in itself that was unacceptable, but the participation in activities outside the realm of traditionally sanctioned religious and social behavior that was dangerous.

Benjamin Hester '10

Claudia Aburto Guzmán, Spanish

Reflections about Frontier Identity through People Living in Mexican-American Border Lands

How does topophilia, the love of land, contribute to identity construction? How do political borders affect this identity construction? I aim to see if identity changes when a person crosses political frontiers or borders, even while remaining within a geographical space used in their identity processes. My research is based on my analysis of interviews conducted with Mexicans at El Colegio de la Frontera Norte in Tijuana, Mexico, and another set of interviews conducted with Mexicans in Laguna Beach, CA. I analyze the interviews with regard to religion, gender, and class. With these three aspects, I am able to examine how political geography, a border, which excludes people that are not part of the preferred national identity, affects identity construction: same geography, same people, and same culture but separated by a line on a map.

Micaela Holland '11

Elizabeth Eames, Anthropology

Ritual Use of Albinos in Tanzania -- see Katherine D'Angelo '11 for abstract

Neeraj Hotchandani '10

Margaret Imber, Classical and Medieval Studies

Degeneration of Citizens' Rights and Increased Brutality in Roman Law

I have explored the causes for the degeneration of citizen rights among the humiliores in the Western Roman Empire. The development of increased cruelty in penal law was made possible by a loss of humanitas caused by a habituation to violence. Increased militarism sparked a desire for gladiatorial games that soon engulfed the fascinated populace. Romans became increasingly comfortable with, even desired the brutal spectacle that further inured them to its horror. This decline in humanitas gradually accustomed many to savagery to the point where violence began to make inroads into penal law. The maiestas trials under Nero and Domitian demonstrate that by making political dissidence a treasonable crime and by assuming jurisdiction over the courts which tried treason, the Princeps was able to use the lex maiestatis as a tool to eliminate senatorial opposition.

Stephanie Houle '10

Margaret Creighton, History

The Bates Home Front: The Implications of World War II on Bates Coeds

During World War II, coeducational colleges across the country became distinctively lop-sided in their enrollment figures. Female students quickly became the majority on campus, opening up opportunities previously unavailable to them. Bates was no exception. Using the invaluable resources housed in the Muskie Archives, this poster exhibits the impact that these wartime concessions had on female students during and after the war.

Alexandra Howard '10

Julie Rabinowitz, Rhetoric

Screening the First Lady: Michelle Obama's Negotiation of Race, Class, and Gender in Entertainment Television

In 2008, Michelle Obama became the first African-American first lady of the United States. An icon of both American womanhood and racial progress, Michelle Obama embodies the intersection of race and gender more prominently than any other American figure. Despite her groundbreaking role, the American public restricts Obama. Tied to traditional expectations of the first ladyship, Obama must negotiate between her private role as a wife and mother and her public role as a champion of social causes. Further bound by race, she must work to identify with African-Americans of varying classes while simultaneously presenting an acceptable image of Black womanhood in keeping with the traditionally White image of the first ladyship. In this thesis, I examine Michelle Obama's enactment of race, gender, class, and first ladyship in her presence on *Sesame Street* and *Iron Chef America*. I suggest that the way Obama performs the multiplicity of roles with which she is saddled on entertainment television reflects societal views on race and gender.

Eli Huebner '13

Sylvia Federico, English

The Agency of Men in Le Morte Darthur and Sir Gawain and the Green Knight

Courtly love has widely been attested to be an institution meant to give power to women in medieval Europe, but this may not be the case. On examination of the texts of Malory's *Le Morte*

Darthur and Sir Gawain and the Green Knight, the reader in confronted with a system in which men pull all the strings. It is the men who start relationships and men who deny them. It is also men who control what happens within a relationship. When women such as Queen Guinevere, actually exercise power, they are seen as evil. This system gives the appearance of agency in order to mask the true situation: a world in which men have complete control.

Interdisciplinary Studies 100: African Perspectives on Justice, Human Rights and Renewal

Leslie Hill, Politics

African Perspectives on Justice: Session Ia

As part of their work in INDS 100, students explored specific issues of justice in African countries. Can justice be served in regions engulfed in disasters and for people who have suffered countless acts of murder and mass destruction? How can the communities themselves and even the international community help in bringing to justice those who are responsible? When can forgiveness be granted and peace restored after human disasters have swept across numerous nations from the Atlantic slave trade to contemporary events? Students present their finding on the following topics:

Gaining Justice through the Middle Passage

Raina, Jacques '13

Post-Genocide in Rwanda: Living Hand in Hand with the Killers

Amanda Sirianni '12

Raising a Voice for Justice in the Congo

Canice Ahearn '13

Fueling the Conflict in Niger Delta Region

Jessica Cooper '13

Can the Suffering Be Saved? Health Care in Africa

Olivia Tawa '12

Interdisciplinary Studies 100: African Perspectives on Justice, Human Rights and Renewal

Elizabeth Eames, Anthropology

African Perspectives on Human Rights: Session Ib

As part of their work in INDS 100, students explored specific issues of human rights in African countries. This panel focuses on the limits and responsibilities of the nongovernmental organization Human Rights Watch within the international community. Is this NGO effective in stopping human-rights violations where it has jurisdiction or are other NGOs more successful in their efforts to end humanitarian crises? Students assess the actions of various nongovernmental and governmental organizations and how they have chosen to address the issue of human rights in Africa, focusing on the following topics:

The Human Rights Watch Perspective on Human Rights

Kate Eisenpress '10

The Changing Role of the United Nations and Other NGOs' Efforts in Somalia's Humanitarian Crisis

Kiely Barnard-Webster '12

Rwanda's National Approach to Human Rights: The Rwandan National Commission on Human Rights as a Domestic Substitute for Human Rights Watch
Elizabeth Leberman '10

Human Rights Watch in Nigeria: The Interplay between Oil, NGOs, and a Modern African Nation

Molly Newton '11

Human Rights in South Africa

Cristian Ruiz,'12

Interdisciplinary Studies 100: African Perspectives on Justice, Human Rights and Renewal

Alexandre Dauge-Roth, French

African Perspectives on Renewal: Session II

As part of their work in INDS 100, students explored specific issues of renewal in African countries. This session examines the process of renewal: the rebuilding of villages, societies, and entire countries. Topics include restoring the environment and agriculture in Tanzania, overcoming military rule in Algeria, rebuilding society in Rwanda after the genocide, reconstructing life after apartheid in South Africa and fighting HIV/AIDS in South Africa. This panel focuses on the challenges and the progress as well as future goals for renewal in these areas. Students will speak on the following topics:

Environmental and Agricultural Renewal in Tanzania

Maayan Cohen '10

Post-Military Renewal in Algeria

Alicia Roy '12

Post-Genocide Renewal in Rwanda

Stephen Wright '12

Political Renewal in Post-Apartheid South Africa

Ryan Langendorf '10

Health Renewal : HIV/AIDS in South Africa and Malaria

Katie Mack '10

Renewed Conceptions of Renewal

Elise Lang '10

Kyle Hutton '10

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Protecting Piping Plovers in Maine

Piping plovers are a shoreline bird found along the Atlantic coast. In the State of Maine, Plover populations are listed as endangered due to stressors like the development and human traffic that accompany the recreational use of beaches. The Maine Audubon Society is taking up efforts to protect piping plovers by setting up exclosures and erecting fence and twine on select beaches. To aid Maine Audubon in its protective efforts, this project maps piping plover habitats along Maine's shorelines and determines their proximity to human development areas. Based on the layout of beach terrain, the project also determines which habitats have are ideal for nesting, feeding, and rearing young. Finally the project examines which habitats are the most at risk from storm surge waters. A series of maps will be made

using the following GIS data layers for Maine's coastlines: roads, storm surge, human development, beach land cover, and plover populations. Ranking plover habitats based on these criteria will help Maine Audubon determine which habitats should be the focus of their protection efforts.

Daniela Jaeckel '10

James Hughes, Economics

Risk Aversion in East and West Germany

Although the Berlin Wall fell more than 20 years ago, the differences between the eastern and western parts of Germany are still glaringly apparent. The two opposing economic systems influenced East and West Germans' behavior and attitudes in different ways. This study uses the large-scale German Socio-Economic Panel to examine risk attitudes of East and West Germans as measured through labor market outcomes (full-/part-time employment, fixed-term contracts, employer change, quits, training, wages and job satisfaction).

Nathaniel Johnson '10

Lee Abrahamsen, Biology

MRSA at Bates

Prevalence of nasal *Staphylococcus aureus* colonization was assessed among individuals from three populations: Bates College students, St. Mary's Hospital Wound Center staff, and local Lewiston area residents. All *S. aureus* isolates were tested for methicillin resistance. Methicillin-resistant *Staphylococcus aureus* (MRSA) isolates were strain-typed and drug resistance patterns were determined. Chi-square analysis was used to assess risk factors for nasal carriage of both the methicillin-susceptible and -resistant strains. Preliminary results from Bates College students indicate colonization rates of approximately 27% for *S. aureus* and 6% for MRSA.

Elyse Judice '10

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Historical Comparison of Migratory Fish Returns to the Connecticut River, CT, from 1967 to 2007 as a Result of the Growth of Dams

The Connecticut River Watershed encompasses approximately 28,500 square kilometers making it the largest river ecosystem in New England (Commonwealth of Massachusetts, 2010). It encompasses the states of New Hampshire, Vermont, Connecticut, and Massachusetts. The first dam was built along the Connecticut River over 200 years ago (U.S. Fisheries and Wildlife Service). Presently, there are over 1,000 dams that block the natural flow path of the river (U.S. Fisheries and Wildlife Service). Although some dams have fish ladders, others make it difficult for migrating fish to return to the Connecticut River during spawning season. Hydroelectric dams that thermally pollute the Connecticut River exacerbate the problem by making waters too warm for fish to survive. This study includes a spatial and temporal analysis of fish counts from Holyoke, MA, of the American shad and the Blueback herring every decade from 1967 to 2007. Data regarding fish counts from 1967 to 2007 and dam construction are available from the U.S. Fisheries and Wildlife Service Web site. The Connecticut Department of Environmental Protection provides the GIS shapefiles needed to complete this analysis. An analysis of fish returns in relation to the number of dams along the Connecticut River are also included in this study. Finally, based on past

patterns of fish returns to the Connecticut River, predictions are made for fish returns over the next decade.

Elyse Judice '10

Beverly Johnson, Geology

Stable Isotope Analysis of *Fundulus heteroclitus* and the Effectiveness of Ditch-Plug Restoration at the Sprague River Salt Marsh, Phippsburg, ME

The Sprague River salt marsh is a back-barrier salt marsh adjacent to Seawall Beach in Phippsburg, ME. The Sprague River salt marsh has undergone significant modification by humans over the past 300 years with evidence of three different episodes of ditching documented. In an effort to restore sections of the marsh by creating pool habitats, the U.S. Wildlife and Fisheries Service plugged several of the ditches in the southern end of the marsh between 2002 and 2006. The purpose of this study is to evaluate the efficacy of the restoration method by studying differences in food web dynamics and water quality in ditch plugs versus natural pools. Stable carbon and nitrogen isotopes from muscle tissue and liver from *Fundulus heteroclitus*, vegetation from biomass cores, sediment from surface cores, and salt marsh vegetation were examined in one ditch-plugged pool, two pools that had been natural but were enlarged in order to obtain salt marsh peat to plug preexisting ditches, and three natural pools. Water quality parameters including pH, temperature, dissolved oxygen, and specific conductivity were measured in 215 pools throughout the marsh to identify pools for more detailed analysis. Our results show that livers are consistently depleted in ^{13}C relative to muscle tissue likely reflecting the presence of more lipids in liver relative to muscle. Additionally, the C and N isotopic composition of *F. heteroclitus* tissues indicate that significant differences exist and is likely reflective of the degree and duration of water saturation and/or salinity of the pools. As a result, differences in mummichog diets appears to be independent of ditch-plug versus natural origin. Additional analyses are currently underway to evaluate our preliminary interpretations.

Zachary Jylkka '10

Francesco Duina, Sociology Panel

U.S. Government Neglect of Social Research Concerning the Impact of Fishery Regulations on Communities: The American Lobster Industry

How important are the interpersonal relationships of fishermen within harbors and communities to the vitality and success of their respective industries? This is a question that state and federal regulatory agencies governing U.S. fisheries ought to always consider before enacting new policies which have the propensity to drastically alter socioeconomic dynamics of fishing communities. Recent trends in fisheries management have encouraged the privatization of common pool marine resources to increase economic efficiency and sustainability, but at what expense? My thesis first explores the state and federal management of the American lobster industry to assess the extent to which government consider social research before deploying new regulations. I then show why it is important to conduct social research in communities prior to the creation of new laws by demonstrating how some recently implemented lobster policies may in fact undermine their designed intent.

Chomba Kaluba '10

Emily Kane, Sociology

Food for Peace: Breaking the Hunger-Violence-Hunger Cycle, Tanzania

In the summer of 2008, 3 Bates students were awarded a Peace Project grant to work in Tanzania on social justice issues. Their project addressed fighting HIV/AIDS, empowering female street children, and ending sex-for-food practice. They designed a sustainable community garden in Mwanza City of Tanzania for orphans and street children through the support of the Davis Foundation Peace Grant.

Nathan Kane '11

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Statistical Insight into the Meaning of U.S. Military Intervention in Pakistan

In 2008 *The New York Times* printed an article about a controversial, "theoretical" map that was created in neoconservative circles in the United States. This portrayed a re-drawn South Asia and Middle East; Afghanistan was much larger and an independent Baluchistan had been carved out of Pakistan's southwest territory. This project tries to determine if this altered map informs U.S. military action by projecting the patterns of U.S. drone attacks onto both the theoretical and the actual maps. Because the U.S. government is not releasing information about the civilian casualties, I use respected news sources to estimate the number of casualties and the location of the strikes. By mapping attacks, and their varying levels of success, on both a real map and the altered map aggregated over a two-year period, this project provides statistical insight into the meaning of U.S. military intervention in Pakistan.

Eliza Kano-Bower '11

Margaret Imber, Classical and Medieval Studies

The Impacts of the Lex Julia de Adulteris

The Lex Julia was the first state sanction against adultery and thus changed the way the "crime" of adultery was treated in the Roman Empire. This presentation discusses the Lex Julia de Adulteris and the actual effect it had on women in the Roman Empire. This political use of the law affected the elite women in the empire since it put them in danger of becoming political tools used to bring down their husbands or lovers. Some elite women, including Augustus's own daughter Julia, faced the harsh punishments the law stipulated. I conclude that most women were not strongly affected by the new laws, but elite women were affected by the political ways in which the law was used.

Mert Karakus '11

Eric Hooglund, Politics

Gender under Islamic Law -- see Mohammed Basij-Rasikh '12 for abstract**Ilya Kashtelyan '10**

Michael Sargent, Psychology

Personality Moderators of Attributional Bias: Need for Cognition, Attributional Complexity, and Preference for Dialectical Reasoning

Research suggests that individuals are likely to misattribute the effects of self-change to changes in the world. Eibach, Libby, and Gilovich (2003) demonstrated that salience of self-change

can decrease this misattribution and proposed that cognitive reasoning drives this effect. The present research evaluated aspects of cognitive reasoning as potential moderators of the relationship between self-change and perception of change in the world. The first study explored the effects of need for cognition and attributional complexity. The second study explored the effects of preference for dialectical reasoning, a cognitive style relatively prevalent among East Asians, compared to other groups..

Esther Kendall '10, Emma Scott '10, Andrea Svigals '10, and Krystina Zaykowski '10

William Low and Anthony Shostak, Museum of Art, and Rebecca Corrie, Art and Visual Culture

The Bates College Museum of Art: A Look at the Experiences and Practices of Student Interns

The Bates College Museum of Art is an important resource for the College, as well as larger community. Education is central to the mission of the museum and informs all aspects of its practices, from changing exhibitions and permanent collections to programming and outreach. Among its many offerings is an internship program that provides Bates students with the opportunity to gain pre-professional training in some of the many aspects of museology as they serve vital roles in museum management and project execution. This past semester, interns organized a major exhibition, *Collection Project 4: Alumni Collections*; provided research on possible acquisitions; and managed public programs. Each of these projects contributed to the museum's mission. It is our hope that the museum can continue to advance its mission to maintain its important collection of art and produce exhibitions that serve a significant role in visual arts education and interdisciplinary learning at Bates and in the community. The goal of this presentation is to reveal some of the processes that take place behind the scenes in the museum and to share what we interns have experienced. We also hope to initiate a dialogue that may help increase awareness of the museum's potential as a resource for Bates's students, faculty, and administration.

Tahira Khalid '10

Rebecca Herzog, Women and Gender Studies

Gender Analysis for a Global Era: New Work in Women and Gender Studies -- see Lisa Hartung '10 for abstract**Madison Kilbride '10**

Mark Okrent, Philosophy

Speech Perception

The ease with which we perceive and produce speech belies the difficulty of the task. Speech perception is quite a feat because the acoustic speech signal does not correspond to what we hear. Our experience of speech sounds has often been compared to beads on a string. We hear speech as composed of discrete, sequentially ordered, transposable units with recognizable beginnings and ends. These equivalence classes of sounds are called phonemes. However, the acoustic speech signal is not segmented. Rather, it is fluid and continuous. Furthermore, there is not a straightforward mapping between the acoustic signal and phonemic classes. In other words, there is not a single acoustic pattern that is present whenever we hear a /d/ or a /g/. Must the lack of isomorphism between physically measurable features of the acoustic stimulus and the subjective features of our

experience lead us to the conclusion that our experience of speech systematically misrepresents the way the world actually is? I reject the view that in order for our perceptions to count as veridical, there must be perceiver-independent entities whose structure is isomorphic with perceived phonemic structure. The tendency of speech perception theorists to think that either there must be something in the world that is phonemically structured or speech perception is a systematic illusion is a false dichotomy. One of the central questions speech perception theorists ask is "What are the objects of speech perception?," which is a technical way of asking what our experiences are about or directed toward when we listen to speech. Carol Fowler argues that the objects of speech perception are articulatory gestures. I agree that articulatory gestures are among the objects of speech perception. However, I reject her argument that vowel and consonant gestures are independent events that structure the acoustic signal in discrete yet temporally overlapping ways. We need to think of phoneme perception in terms of the larger articulatory event that contains all of the information that the perceptual system uses in categorization.

Monthe Kofos '11

Lavina Dhingra, English

Image and Sound: Reading and Writing Lyric Poetry -- see Kathryn Collier '13 for abstract

Zachary Kofos '13

Lavina Dhingra, English

Image and Sound: Reading and Writing Lyric Poetry -- see Kathryn Collier '13 for abstract

Kira Kramlich '10

Leslie Hill, Politics

The Issues behind the Civil War in Somalia and the Road to Renewal -- see Jillian Fogarty '10 for abstract

Jennifer Kress '12, Jacob McIntosh '13, and Eleanor Torrey '10

Alexandre Dauge-Roth, French

Hutu Women's Role Both in the Genocide of the Tutsis in Rwanda and in Its Rehabilitative Aftermath

Many Hutu women played key roles in the planning and execution of the Tutsi manhunt of 1994. We consider some central figures such as Agathe Habyarimana and their strategies to initiate and perpetuate the killings. However, not all Hutu women were involved in this way, and post-genocide, both Hutu and Tutsi women participated in creating Avega Agahozo, an organization founded to address the needs of widowed women and orphaned children. Today in Rwanda, some Hutu women are working toward the complex and difficult process of rehabilitation. This study was undertaken in INDS 100, African Perspectives on Justice, Human Rights and Renewal.

Emma Krueger '10

Joshua Henry, Chemistry

Surface Chemistry of Cadmium Selenide

Global energy demand has increased dramatically over the past half century. Solar energy has the potential to meet this demand, but improvements in energy harvesting technologies like photovoltaic cells are critical. Photovoltaic cells based on semiconducting nanoparticles have theoretical efficiencies of over 68% and represent a potentially huge improvement over

traditional photovoltaic devices, but experimental devices to date have been far less efficient (~5%). The discrepancy between predicted and observed efficiencies is at least in part attributable to surface chemistry. In photovoltaic cells made from cadmium selenide (CdSe) nanoparticles, removal of surface-bound ligands resulted in hundredfold increases in efficiency. The ligand, trioctylphosphine oxide (TOPO) and its interaction with the surface of cadmium selenide are the focus of our research. The presence of TOPO on CdSe is readily identified by Fourier Transform Infrared (FTIR) spectroscopy through the strong vibration of its phosphorus-oxygen bond. Our research shows that this bond is exceptionally sensitive to its electronic environment making FTIR a powerful tool for investigating the nature of the CdSe-TOPO bond.

Emily Kuehn '10

Nancy Koven, Psychology

The Selective Role of Cognitive Control in Utilitarian Decision Making

There is a long-standing debate in the discussion of morality as to whether rational or emotional processes dominate in order to arrive at a decision within a moral domain. Classically, rational processes are discussed as the fundamental process for moral decision making; however, more recent research has suggested that emotion plays an equally important role in moral decision making (Haidt, 2001). Current dual process theories concerning moral decision making combine rational and intuitive thinking styles as competitive processes, where a rational or utilitarian decision is arrived at by overriding competing emotional processes (Greene, 2008). Although emotion is an integral part of moral decision making, it is beyond the scope of this study to further classify its role in moral decision making. It is the purpose of this study to classify the role of cognitive control in utilitarian decision making. Evidence from previous studies suggests that utilitarian responses are strongly associated with activation of the DLPFC and the ACC (Greene, et al. 2004), which suggests a selective role of response inhibition in utilitarian judgment. Other research includes models of the DLPFC and working memory as crucial for utilitarian decision making, as cognitive load selectively interferes with utilitarian decision making (Greene, Morelli, Lowenberg, and Nystrom, 2008). Participants in this study will be grouped by their utilitarian tendencies in response to a moral dilemma questionnaire. Scores for response inhibition tasks (CPT-II and D-KEFS Color-Word Interference test) as well as scores from verbal and spatial working memory tasks (PASAT and WMS-II spatial span respectively) will be compared between utilitarian and non-utilitarian groups. I expect to observe lower error rates for the utilitarian groups in response inhibition tasks as well as higher percent correct trials for the utilitarian groups in working memory tasks when compared to non-utilitarian groups. This effect should also be selective to verbal working memory and not spatial working memory.

Rachel Kurzius '10

Sylvia Federico, English

Deconstructing the Language of Revolution in the Poetry of Gioconda Belli

My thesis explores the work of Gioconda Belli, a Nicaraguan poet whose literary life intertwined with her activism in the Sandinista Revolutionary Front. I studied abroad in Nicaragua last spring, and felt utterly struck by the national passion for

poetry; among the many wonderful poets, Belli's straightforward style and erotic sensibility is particularly resonant. She writes about uniquely feminine experiences and ties them to the fate of her nation. My close reading and critical analysis of her text functions as the fulfillment of my English thesis, and I apply the ideas of Marxist theorist Louis Althusser to deconstruct the language of revolution. I examine her notions of agency: Who has power? Who acts and who is acted upon? I contextualize her work in light of Nicaraguan history and politics, as well as the feminist notion of revisionist mythmaking and the feminization of land.

Sarah Kwoh '10

Michael Murray, Economics

How Language Skill Acquisition Affects Immigrants' Earnings

It has been established in scholarly literature that fluency in the host-country language increases immigrants' earnings by about 14%. In a case study done by Geoffrey Carliner, it is shown the longer an immigrant lives in the host country the more exposure he or she will have to the new language, which will increase his or her assimilation rate. This paper tests to see if the types of immigrants coming to the United States today still have the characteristics of fewer years of education and less work experience that Carliner found in 1996. I will also examine how the amount of prior exposure to the new language before migration and current exposure to the new language after migration increases the returns of language skill acquisition for immigrants. Finally, I will decipher whether learning by reading, listening, or speaking proves to initially raise immigrants' earnings by a higher percentage.

Kristin LaConte '10

Georgia Nigro, Psychology

Communication Dynamics between Well Parents and Children During the Loss of a Second Parent Due to Terminal Illness

This study examines the dynamics between a healthy parent and a child during the loss of the other parent to terminal illness. Research focused on how the child's communication with the well parent impacted the child's process of coping with parental bereavement. The researcher interviewed surviving parents, children, and parent-child pairs who have experienced the loss of the child's other parent. "Child," for the purposes of this study, referred to any individual who was under the age of 18 at the time of the parent's death; however, interviews took place any number of years after the death. Reflections on communication, as expressed by parents and children, are compared to identify effective parenting and communication strategies for use during the loss of a second parent.

Andrew Laflam '10

Paula Schlax, Chemistry

Regulation of Alpha Operon r-proteins in Synechococcus Sp.

This study is an investigation of translational repression mechanisms across diverse species of prokaryotes. In *Escherichia coli* the alpha-operon is repressed by S4, one of the proteins that is coded within the operon. In the organisms used for this study, unique genomic arrangements with respect to the alpha-operon suggest a repression mechanism that differs from that of *E. coli*. The goal of this investigation is to determine whether unique mechanisms of translational repression have

evolved in diverse species due to variation in genomic arrangement.

Elise Lang '10

Karen Palin, Biology

Vitamin D and Calcium Education

Recent national studies have shown that 7 out of 10 children are vitamin-D insufficient. Vitamin D is a fat-soluble prohormone that plays an important role in regulating body levels of calcium and bone mineralization. Adequate vitamin D and calcium nutrition is important for healthy bone growth. This study tests 5th/6th graders' knowledge about the importance and functions of these vitamins and estimates through a food diary whether they have sufficient vitamin D and calcium intake. The students are asked to take a survey to determine their knowledge of vitamin D and nutrition, to keep a food diary of the foods and drinks they consume for one week, participate in short activities and complete small homework assignments. Post-tests will assess student learning achieved through the nutrition workshops and activities.

Rebecca Lange '10

John Kelsey, Psychology

PCP-Induced Behavioral Changes in the Hole-Board Apparatus as a Rat Model of Schizophrenia: The Role of the Metabotropic Glutamate 5 Receptors

The glutamate NMDA receptor antagonist phencyclidine (PCP) induces all symptom sets of schizophrenia in healthy individuals, and is used to reproduce them in animal models. In many studies, acute injections of PCP (4.0 mg/kg) induce hyperlocomotion and decrease head-dipping in rats within a hole-board apparatus (HBA), two behaviors presumed to reflect the positive and negative/cognitive symptoms, respectively. A typical antipsychotic reduces the first symptom, and an atypical reduces both symptoms, consistent with their clinical efficacies. The first goal of this study is to determine if these effects are mimicked by additional antipsychotics. The second aim is to use the HBA to examine the effects of drugs that alter transmission at the mGluR5 receptor, which is associated with the NMDA receptor. Preliminary research suggests that mGluR5 activation may have therapeutic potential across all symptoms. Therefore, drugs that activate this receptor may prove antipsychotic, while drugs that block it may be pro-psychotic.

Ryan Langendorf '10

Ryan Bavis, Biology

Modeling Diving Patterns of Foraging Crabeater Seals

While much of the physiology and behavior behind seal diving patterns is understood, little has been done in the way of linking the two. In light of this, I constructed a physiologically based model to contextualize seal behavior. The dive data used was recorded by Satellite Relay Data Loggers attached to 34 crabeater seals (*Lobodon carcinophagus*) in the Marguerite Bay Region of the Antarctic Peninsula during the winters of 2001 and 2002. Telemetry was collected for up to 174 days and the seals with the most complete dive records were used to model and analyze diving patterns. Oxygen handling was modeled using a combination of diffusion equations for oxygen transport throughout the blood and muscles, with dive-specific metabolic rates which were empirically derived. Parameters were determined from previous studies on free-diving seals, both crabeater seals and other species as well. Rather than using

statistical approaches, this physiologically based model was used to isolate bouts and determine behavioral patterns. Estimated spatial coordinates from ARGOS satellites were also used to add a spatial component to the diving patterns. In conjunction with recent work on the quality of patches in which seals dive, this analysis continues the important task of modeling seals as part of an interactive environment. Ultimately, the model is intended as a robust, predictive tool that provides insight into the behavior of diving crabeater seals.

Ramona Lapadus '10

Francisca López, Spanish

Integration of Romanian Immigrants in Spain: Achievements and Challenges

This thesis investigates how economic and social factors affect the cultural integration of Romanian immigrants in Spain and, particularly, in Madrid. Integration describes the process of adaptation of Romanian immigrants as well as the attitude of the locals toward the growing community of immigrants. Over the past two years, the Romanian and Spanish governments have been collaborating to promote the positive aspects of the migratory process investing in a campaign addressed to both Spanish and Romanian citizens. The communication campaign, entitled "Rumanos en Europa," includes the documentary *Un euro, 3,6 lei*, by director Carlos Iglesias, the study "Rumanos en España," by professor and economist Ramón Tamames, and the mass media campaign "Hola soy rumano." In addition, interviews, questionnaires, and newspaper articles relate individual true stories about the achievements and the struggles of Romanian immigrants in Madrid and its suburbs.

Nancy Lappetito '10

Susan Langdon, Psychology

College Students: Athletic Identity, Alcohol, and Sustaining an Athletic Injury

A substantial amount of research has been conducted regarding college athletes and their experiences with injury and alcohol. Some statistics reveal that up to 80 % of college athletes have been seriously hurt while playing sports. It is proposed that athletes use alcohol as a coping mechanism to help manage the emotional and physical pain associated with experiencing an injury. Athletes, especially those with a strong athletic identity, consume larger quantities of alcohol and drink more frequently than non-athletes. The primary focus of this study is to determine if the strength of athletic identity can predict an individual's likelihood of using alcohol as a way to cope with sustaining an athletic injury. An online survey was created which manipulated the severity of the athletic injury. Each participant was randomly assigned to a version of the survey and the differences between these conditions will be analyzed. The data from this study could be beneficial to athletic personnel who are interested in implementing new strategies to help athletes cope with injuries.

Catherine Lary '11

Rebecca Herzig, Women and Gender Studies

Gender Analysis for a Global Era: New Work in Women and Gender Studies -- see Lisa Hartung '10 for abstract

Benjamin Latham '11

Stephen Sawyer, Off-Campus Study Program

The Impact of an Oil Spill on Fishing in Madagascar

This past semester I spent four months on SIT's Madagascar: Ecology and Conservation program, based out of Ft. Dauphin, in the southernmost region of the country. My program included two language classes and two seminars, as well as a month-long independent study project. For my research, I traveled to the rural fishing village of Faux Cap to study the economic and social impacts of a fishing ban imposed after the MS Gulser Ana oil spill late August, 2009. I collected data through interviews with local fishermen and farmers, although I found it very difficult to get unbiased information. I found that fishermen who continued to fish despite the ban were just as hurt financially as those who respected it, and that all the residents found it more difficult to feed their families, as the removal of fish from the market raised the prices of substitute goods.

Latin 204: Republican Poetry

Dolores O'Higgins, Classical and Medieval Studies

Miles Gloriosus (The Swaggering Soldier)

The members of Latin 204, Republican Poetry, perform scenes from Plautus' *Miles Gloriosus (The Swaggering Soldier)* in Latin. The class rehearsed together, outside of class. There are eight student actors, each of whom is responsible for lines and stage directions. *Miles Gloriosus* is an ancient comedy depicting a sting operation to divest a foolish and boastful mercenary soldier of a girl he has kidnapped. The cast includes wily slaves and scheming prostitutes, as well as the obtuse hero. The performance conforms to some traditional characteristics of ancient Roman comedies. English translations are provided in supertitles.

Julia Lee '10

Holly Lasagna, Harvard Center for Community Partnerships

Collaborating on a Community Food Assessment: Unraveling Hunger and Food Justice in Lewiston -- see Anna-Frances Chase '10 for abstract

Julia Lee '10

Emily Kane, Sociology

Perceptions of Access to Healthy Foods in Lewiston, ME

Food insecurity is currently a major problem in the United States. Research shows that individual and family food insecurity is linked to issues such as health and nutritional deficiencies, weight problems, and social status. Therefore, access to healthy foods is an issue of critical importance. Through a senior thesis project with Local Food for Lewiston and Lewiston's Community Food Assessment, I am helping identify food accessibility issues in Lewiston, ME. This is being done through a series of qualitative interviews with Lewiston residents on the meaning of "healthy" foods, and the barriers they may face in accessing these items. This community-based research helps inform my thesis and provide data for the Community Food Assessment, so that they can better analyze and address the community's needs for accessible, affordable, and culturally appropriate healthy foods.

Joshua Linscott '10

Paula Schlax, Chemistry

Translational Regulation of RpoS in *Borrelia burgdorferi*

The alternative sigma factor RpoS is essential in the expression of key virulence factors in the spirochete *Borrelia burgdorferi*. Our studies investigate the role of the extended 5' UTR and corresponding secondary structure of different length rpoS mRNA transcripts. Equilibrium affinity assays using 30S ribosomal subunits purified from *Escherichia coli* indicate that the small ribosomal subunit binds with a higher affinity and to a greater extent to the short (-50 nt) rpoS transcript than the long (-171 nt) rpoS. Translational efficiency was measured using in vitro primer extension "toe-print" assays and the translational efficiency of the short rpoS transcript is up to 3-fold greater than translational efficiency of the longer transcript. Additionally, a second ribosome binding site is detected on the long transcript. A synthetic DNA regulator that mimics the natural sRNA translational regulator DsrABb increases translational efficiency of the longer transcript and modulates 30S subunit interactions at the alternative ribosome binding site. Examination of the effects of mutations that influence the sequence and structure of the ribosome binding state and comparisons between *E. coli* and *Borrelia* 30S subunits is described. It is our desire that this research will give insight into the life and development of *Borrelia burgdorferi*.

William Loopesko '10, Sallie Mack '13, and Julie McCabe '12

Alexandre Dauge-Roth, French

Comparing Judicial Systems for the 1994 Genocide in Rwanda

This poster examines the post-genocide penal system in Rwanda. Through a three-fold comparison of the *gacaca* trials, the ordinary criminal justice system in place before and after the genocide in Rwanda, and the International Criminal Tribunal for Rwanda (ICTR) trials in Arusha, Tanzania, we compare the merits and criticisms of each. We also aim to contextualize the development and implementation of post-genocide penal systems by examining the international community's involvement in the years leading up to the 1994 genocide and the ongoing period thereafter. This study was undertaken in INDS 100, African Perspectives on Justice, Human Rights and Renewal.

William Loopesko '10

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Base Mapping and Recording the Vegetation Zones, Wildlife Habitats, and Soil Types of the Harvey Ranch, Hutchinson County, TX

The Harvey Ranch is a 35,000-acre property located in the Hutchinson County, 16 miles north of Skellytown in the Texas Panhandle. Currently the ranch is being used primarily for cattle ranching activities with minor oil and gas exploration sites. The development of a guided hunting program is being explored. The objectives of this project are to construct the first comprehensive base map of the ranch. Ranch facilities are mapped by georeferencing high-resolution Google Earth maps. DEM data, soil data, and vegetation data are added to the base map using online data sets from the USGS Seamless Server and the Texas Bureau of GIS. The objective of the project is to determine the ideal location for agricultural plots on the ranch. The analysis takes into account factors such as soil and vegetation types, wildlife habitats, watershed characteristics and topography. The location of a hunting lodge will also be determined using the same parameters.

Sallie Mack '13

Alexandre Dauge-Roth, French

Comparing Judicial Systems for the 1994 Genocide in Rwanda

-- see William Loopesko '10 for abstract

Elizabeth Martin '10

Katherine Mathis, Psychology

Are You Tough Enough: The Relationship between Athletic Status, Athletic Identity, Gender, Gender Roles, and Toughness with Pain Tolerance

The current study focused on the relationship between athletic identity, athletic status, gender, and gender roles on an individual's pain tolerance. Due to the nature of individual responses to pain, and documented pain tolerance of elite male athletes, further research must be conducted to determine the best factors for predicting pain tolerance levels. Previous research has tested differing pain tolerances between athletes and non-athletes, masculine and feminine individuals, and between men and women. However, the measure regarding athletic status fails to account for a person's identification as an athlete, thus the Athletic Identity Measurement Scales (AIMS) was used to assess participants' athletic identity. Additionally, the BEM Sex Role Inventory (BSRI) scale was used to group participants by gender identification; a classification that will consider masculinity or femininity as an indicator of pain tolerance. To effectively measure pain tolerance the experiment used the Cold Pressor Task (CPT), a procedure which records the duration of time a participant can submerge their arm in freezing water. Prior to the cold pressor task, men and women completed the AIMS, the BSRI, and demographics questions, including gender and athletic status. It was predicted that high athletically identifying masculine male athletes would have the highest pain tolerance. It was also predicted that athletic identity would provide the best predictor for pain tolerance.

Avery Masters '10

Claudia Aburto Guzmán, Spanish

Partners in Health Maine in Miskito Coast, Nicaragua

My presentation focuses on the Miskito Coast of Nicaragua and its African descendant population. I discuss the work and educational projects of the nonprofit group Partners in Health Maine, for whom I interpreted during my stay in Nicaragua. I have photos from my trip, background information about the Miskito coast and its people, and reports of our projects and the clinics in Bilwaskarma and the surrounding villages. Using my experiences as a lens I highlight the medical assistance given through rural clinics in order to alleviate diarrhea and malaria which are the most common causes of infant death. I also present the larger questions of exclusion and discrimination that plague communities like the Miskitos that represent African diaspora and indigenous groups in Central America. I connect their problems with the efficacy of American foreign aid and my experiences in nonprofit work.

Mathematics 255C: Mathematical Models of Social Dilemmas.

Bonnie Shulman, Mathematics

Evolutionary Game Theory Poster Session

Philosophers have long pondered the question of what, if anything, distinguishes humans from animals. Many ideas have been proposed, including the capacity for cooperation and

altruism. However, Darwin and others ultimately suggest that "the moral sense or conscience" is also present in animals, and the differences are more a matter of degree than kind. Even if, as Darwin conjectured, moral behavior (the capacity to act for the benefit of another at cost to oneself) is continuous between animals and humans, we are still left with a mystery to ponder: How can behavior that harms one's chances of survival and/or reproduction result from natural selection? This is the problem considered by students in Math 255C, Mathematical Models of Social Dilemmas. They present their final projects in poster format, including the following topics:

Ian Gilchrist '11, Neal Goldberg '12, William Hines '11, and Bradley McGraw '10
Applications of Evolutionary Game Theory to Vaccination Strategies

Arjada Bardhi '12, Ngoc Ngo '12, Lirong Tan '11, and Tianjiao Yan '11
Cultural Influences on Behavior in the Ultimatum Game

Michael Evans '10, Mert Karakus '11, and Michael Rashkov '11
An Evolutionary Game Theoretic Approach to the Optimum Tax Rate

Casey Dropkin '12, Sophie Leonard '12, and Emily Tato '12, and Nina Wolf '12
Evolutionary Game Theoretic Explanations for Animal Conflict and Cooperation

Mohamed Cader '11, Miles Davee '11, Tasnia Huque '12, and Dae Ro Lee '11
The Handicap Principle: Costly Signaling and Why It Evolved

Justin Johal '13, Sean McGhee '12, and Elliott West '13
How Cooperation Can Help Prevent Major Disasters

Katherine Bernier '11, Rachel Carlson '11, and Eammon Riley '11
Nice, Provocable Strategies: The Iterated Prisoner's Dilemma and the Evolution of Cooperation

Syed Hasan '10 and Ramona Lapadus '10
Voluntary Charitable Contributions and Nonprofit Capital Structure: An Evolutionary Game-Theoretic Perspective

Abby Mays '10
Sawyer Sylvester, Sociology
What's Missing: Exploring Sex Education in Maine Public Schools
In 2002, Maine set forth a mandate for comprehensive sexuality education in all public schools. Alongside this mandate, Maine rejected federal funding for abstinence-only programs offered under the Bush administration. These decisions should make Maine's sexuality education programs among the more comprehensive in the nation. My thesis explores these questions: Are Maine's programs universally comprehensive? If there is variation in the quality of programs, why? My methods of investigation included talking to sex education teachers and administrators responsible for implementing the mandate, as

well as those who designed the mandate. Through this process I discovered that not all sex education programs in Maine are created equal, that a lack of assessment of health programs makes for legislation that is almost impossible to enforce, and that teachers and administrators alike struggle with the disconnect between what is hoped for in Maine and what is actually accomplished.

Julie McCabe '12
Alexandre Dauge-Roth, French
Comparing Judicial Systems for the 1994 Genocide in Rwanda
-- see William Loopesko '10 for abstract

Maura McGee '10
William Corlett, Politics
The Architecture of Social Life in a Participatory Democracy: Gated Spaces, Gated Selves, and Gated Politics in the United States
This presentation prods the links between the constructed environment, social life, and democratic politics in the United States. It exists in the intersection of the theoretical frameworks of space, society, and democracy and explores the spaces that comprise the social world, the public and private spheres, and how such spaces affect democracy and our relations to ourselves and others. It considers the structures that shape our social and political world and how those structures shape that world and influence how we experience life within it. More specifically, it examines the residential gated community and the online social network to understand the changing nature of the public realm and what that means for a democratic society.

Sean McGowan '10
John Smedley, Physics
Analysis and Investigation of the Solar Chimney
On a yearly basis, the energy coming from the Sun is ten thousand times the Earth's energy demand. If we could harness even a fraction of a percent of this energy, we could meet our increasing energy demands and reduce harmful greenhouse gas emissions. One way to utilize solar energy is to produce electricity through the construction of a solar chimney. The solar chimney uses a large collector sheet which traps solar-heated air beneath it. The warm air rises and flows out through a tall chimney, turning a turbine at the chimney's base to generate electricity. This thesis compares the theoretical power output of a small scale solar chimney on the Bates campus to its measured performance.

Jacob McIntosh '13
Alexandre Dauge-Roth, French
Hutu Women's Role Both in the Genocide of the Tutsis in Rwanda and in Its Rehabilitative Aftermath -- see Jennifer Kress '12 for abstract

Justin Medeiros '10
Amy Douglass, Psychology
A Mediation Examination of the Relationship between Transformational Leadership Behaviors and Athlete Self-Efficacy
Sport coaches attempt to employ positive beliefs and optimal styles of leadership to most effectively influence their athletes' behaviors and beliefs. Transformational leadership styles have

been suggested as the best forms of leadership to make a positive impact on athletes. Transformational behaviors such as inspirational motivation and individual consideration influence athlete self-efficacy. The current study proposed that transformational leadership behaviors, such as inspirational motivation and high performance expectations, exhibited by coaches would positively influence the self-efficacy ratings of athletes, while also controlling for a mediating relationship of athletes' perceptions of coach self-efficacy influencing the athletes' self-efficacy.

Russell Milholland '10

J. Dykstra Eusden, Geology, and Camille Parrish,
Environmental Studies

Baseline GPS Mapping of the South Pond Preserve, Buckfield, ME

The Western Foothills Land Trust (WFLT) is a small conservation organization with a mission to acquire and conserve land in the Oxford Hills Region of Maine. In 2009, the WFLT conserved 1294 acres around South Pond in the town of Buckfield. The South Pond Parcel contains old logging roads, ATV and snowmobile trails, cemeteries, historic cellar holes, and a variety of different ecosystems. A comprehensive recreation management plan would require that current trails and scenic opportunities be inventoried and consolidated to allow for informed restoration of current infrastructure and new trail construction projects. This project uses ArcGIS mapping software to create a baseline of maps of various ecosystems, recreational opportunities, and historic cultural sites on the South Pond Preserve. Data from the Seamless Server, MaineGIS, and National Wetland Inventory databases are analyzed in conjunction with original GPS data into several maps for use in future land management.

Christopher Miller '10

Margaret Imber, Classical and Medieval Studies

Fideicommissa

The Roman will provides historians with valuable perspectives into the daily lives, the daily worries, and the daily appearances of the average Roman. Wills were culminations of the individual, representations of the true nature of the testator in their last moments on earth. Wills were public and private documents, representing the wishes of the testator, but also his/her desire to maintain social appearances. This presentation focuses on *fideicommissa* or trusts, and by analyzing the social background of wills, the legal adaptations of trust law drastically altered the face of Roman law. Trusts played a legal cat-and-mouse game in the legal realm and only by the restriction and regulation of trusts did the government finally gain control over the practice. After a long legal battle, trusts effectively fused with direct inheritance and drastically reformatted hereditary succession in the Empire.

Peter Miller '12

J. Dykstra Eusden, Geology, and Camille Parrish,
Environmental Studies

Bedrock Geological Map of Georges Islands, Muscongus Bay, ME

The simplified bedrock geology of Maine and certain regions on the 1:100,000 scale have been well mapped by geologists, yet there are many smaller quadrangles that remain unmapped or unpublished. The bedrock geologic map of the Georges Islands

off the coast of Port Clyde is a compilation of numerous Bates Geology Department theses. The area studied consists of Ordovician - and Devonian/Silurian-aged rock formations with younger dikes cutting through the older rock. The gabbro-diorite and granite outcrops that compose the islands were felsic and mafic magmatic intrusions into the older crust during a period of high volcanic activity. The outcrops mapped are the remnants of pockets of magma that cooled and solidified underground. The bedrock map was compiled in Adobe Illustrator using polygons to represent geologic units, lines representing contacts, and points representing strikes and dips of foliation and bedding. The objective of this project was to transfer the polygons, lines, points, and tiff files from Illustrator to Arc GIS to create a working map that can be posted online as an open file report with the Maine Geological Survey.

Courtney Mitchell '10

Helen Boucher, Psychology

The Effect of Affirming Relational Selves on Replenishing Self-Regulation

This study attempted to determine if a category of self-affirmation -- relational selves, counteracts self-regulatory depletion. There were approximately 80 students in this study (40 males and 40 females). Participants completed a writing task designed to induce self-regulation in half of the sample. Half of the participants were instructed to free write on a topic while the other half was given the same topic but told not to use the letters a or n. Next, participants completed a writing task wherein half the participants affirmed a relational self and the other half completed a filler task. Finally, the participants' ability to self-regulate was tested by the administration of the Stroop test. The predicted finding was that participants in the relational self-affirmed condition would make less color naming errors than participants in the non-affirmed (control) condition, indicating that affirming relational selves replenishes self-control when it has been depleted.

Jennifer Morse '10

J. Dykstra Eusden, Geology, and Camille Parrish,
Environmental Studies

Mapping the Devastating Effects of the Earthquake in Haiti

Following the devastating effects of the earthquake in Haiti, disaster relief action became an immediate priority in order to respond to the national emergency and infrastructure damage. GIS mapping has the unique ability to rapidly analyze data and show the areas of Haiti that were most affected. The purpose of this project was to develop a GIS map that illustrates the areas in Haiti that sustained the greatest damage as well as the areas with the highest population in order to prioritize needing the greatest relief efforts. In addition, a second GIS map shows the road damage and road blocks that affected access to the damaged areas in Haiti. In order to create these maps, important variables were defined such as fault activity, building destruction, population density, building destruction, bridge destruction, and road blocks.

Ashleigh Musser '10, Emma Scott '10, and Benjamin Trook '10

Alexandre Dauge-Roth, French

Burundi and Rwanda: A Comparison of Conflicts between Hutus and Tutsis and Where the Countries are Today

Burundi and Rwanda are neighboring countries in East Africa whose populations were divided into Hutus and Tutsis, categories that were created and implemented by colonizers. We compare and contrast the history of both countries leading up to the conflicts in 1993 in Burundi and 1994 in Rwanda, the conflicts themselves, and how the countries are recovering presently. This study was undertaken in INDS 100, African Perspectives on Justice, Human Rights and Renewal.

Leena Nasser '12

Eric Hooglund, Politics

Gender under Islamic Law -- see Mohammed Basij-Rasikh '12 for abstract

Jorie Ohlson '10

Elizabeth Eames, Anthropology

Ritual Use of Albinos in Tanzania -- see Katherine D'Angelo '11 for abstract

Alicia Orkisz '10

Leslie Hill, Politics

United States Involvement in Somalia -- see Tiarra Abell '12 for abstract

Alicia Orkisz '10

Sue Houchins, African American Studies

Haiti's Quest for Autonomy: Understanding the Sociocultural and Economic Effects through a Brief Survey of Caribbean Literature -- see Vantiel Duncan '10 for abstract

Nola Palombo '10

Hong Lin, Physics

Low Frequency Instabilities at High Injection Currents in a Vertical-Cavity Surface-Emitting Laser subject to Isotropic Optical Feedback

I experimentally studied the low frequency instability that is present at high injection currents just above the LP-11-S mode's threshold. My control parameters were current, feedback strength, and laser temperature. How my control parameters affected the low frequency peak's amplitude, frequency, and current regime where it is present was observed. I also calculated the cross correlation coefficient of the orthogonal polarizations for both the fundamental and LP11S mode at different time intervals and feedback strengths.

Judson Peck '11

Stephen Sawyer, Off Campus Study Program

Growing Food at the Top of the World: A Case Study of Greenhouses in Khumbu, Nepal

During my study-abroad program in Nepal, I trekked for three days without guide or porter and only a little Nepali language toward Everest. I stopped in the villages below the massive peak to live with and interview the villagers who had received greenhouses as part of a community development project from a national park, that has enclosed and cut off the villages from valuable resources. My goal was to determine the economic, social, and environmental impacts of the greenhouses in

Khumbu. Waking up every morning to the sun rising over the mighty peaks I interviewed farmers who lead expeditions up Everest.

Judson Peck '11

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Tourism's Effect on Cultivated Land, Rangeland and Forested Land on Mount Everest

Mount Everest draws trekkers and tourists from around the World to gaze at or climb the towering peak. The influx of seasonal tourists has led to significant changes in the lifestyles of the residing population of Sherpas. Originally subsistence farmers and traders with nearby Tibet, many Sherpas have been lured into the profitable tourist economy. The shift in labor from agriculture to tourism has impacted the natural environment. After a recent trip to the region I learned that cultivated land and rangeland is decreasing as people engage in tourism and forest cover is increasing as a result of the use of alternative technology now affordable from the more lucrative tourist market. My goal is to determine how land use has changed from the 1970s to the present, specifically focusing on cultivated land, rangeland, and forested land. I will use GIS to classify the land types based on statistical analysis of Landsat images.

Marilla Pender-Cudlip '10

Rachel Austin, Chemistry

A Mechanistic Inquiry into Partially Pure ω -Alkane Hydroxylase

The kinetically challenging conversion of alkanes to alcohols is important for several reasons. Key to this reaction is understanding the metal-based enzymes that facilitate the reaction. This research targets ω -Alkane Hydroxylase (AlkB), the dominant metalloenzyme in organisms that use alkanes as their sole energy source. Our goal is to purify AlkB, crystallize it, and characterize its reaction mechanism. A key step in crystallizing the protein is solubilizing it to remove it from the cellular membrane that it spans. We have found that adding Deoxycholate detergent (DDM) results in a solubilized and active protein. Strains of AlkB used in this study are *Pseudomonas Putida* GPo1 (AlkB-containing soil organism) and *Alcanivorax borkumensis* AP1 (AlkB-containing marine organism). We have also found that AlkB catalyzes the oxidation of alkanes by generating a substrate-based radical consistent with a high-valent iron intermediate on the enzyme. This mechanistic data is consistent with a sterically restricted active site. We have seen that the thermodynamically favored position is oxidized in smaller molecules, while the sterically favored position is oxidized in larger molecules. Studies with more substrates will allow us to further relate mechanistic data to structural information.

Margaret Pennoyer '10

Emily Kane, Sociology

Watering Even the Youngest Plants?: Concerted Cultivation of Preschool-Aged Children

Concerted cultivation is a phrase coined by Annette Lareau (2003) to describe the ways in which parents consciously strive to develop their children, a tendency she finds is particularly common among middle- and upper-middle class parents. While Lareau's (2003) study of concerted cultivation focuses on parents' elementary-school-aged children, my thesis investigated

whether concerted cultivation is also used by urban upper-middle class parents as a way to parent preschool-aged children. This study involved drawing upon research from Lareau (2003) and Redford, Johnson, and Honnold (2009) to create interview questions that address specific aspects of concerted cultivation and interviewing a sample of 19 upper-middle class mothers of preschool aged children in New York City. The results of this study show that upper-middle class mothers in New York City use concerted cultivation to prepare their preschool-aged children for future education access. They do this through transferring cultural capital, parental involvement, habitus, and the organization of daily life.

Gina Petracca '10

Krista Scottham, Psychology

Cooking Made Easy: A Healthy Eating Behavior Change Intervention for Adolescents

Adolescent obesity has become a national epidemic in the United States of America, generating an urgent need for adolescents to make healthier eating choices. Research shows that adolescents who help cook food in their households have healthier diets and better eating behaviors than those who do not assist with preparing food (Larson, Story, Eisenberg, & Neumark-Sztainer, 2006) and that cooking programs successfully teach adolescents the necessary skills for food preparation. Interestingly, there is very little research on the effectiveness of cooking classes as an intervention for creating changes in eating behavior. The current study developed a behavior change intervention in the form of a cooking class, using the transtheoretical model of change -- which has been used in a variety of health behavior change interventions -- as its framework, in an attempt to demonstrate the effectiveness of cooking classes to initiate healthy eating behavior changes in adolescents. The program was assessed using a stages-of-change questionnaire, individual interviews and focus groups. Qualitative results indicated that adolescents' eating behaviors were positively affected by the cooking classes. Quantitative results will be discussed after additional data collection. Based on the findings the use of cooking classes as healthy eating interventions for adolescents is highly encouraged.

Ngoc Pham '10

T. Glen Lawson, Chemistry

The Development of a Method for the Kinetic Analysis of EMCV 3C Protease Catalytic Activity

The concentration of viral proteins in infected cells depends upon the rate of synthesis, processing, and degradation of these proteins. As with other picornaviral 3C proteases, the encephalomyocarditis virus (EMCV) 3C protease catalyzes the majority of processing cleavages in the large polyprotein precursor produced by EMCV, thereby releasing functional viral proteins. In addition, it has been found that the 3C proteases target cellular substrates, thereby inactivating host proteins including transcription and translation factors and other proteins needed for host cell defense. Kinetic analysis has the potential to be a useful tool for examining the efficiency with which the 3C proteases catalyze peptide bond cleavage. Previous studies, using very short synthetic polypeptides, have provided information about the reactions catalyzed by the 3C proteases of a small number of picornaviruses. However, there have been no thorough kinetic measurements of EMCV 3C protease cleaving activity. For this study, I have prepared and evaluated, using a

novel expression vector, EMCV 3C protease protein substrates for the purpose of determining the biologically relevant kinetic parameters that characterize 3C protease processing reactions. The results of this study will provide new insights into the 3C protease-catalyzed cleavage of viral, and possibly cellular, substrates.

Laura Poppick '10

Michael Retelle, Geology

Modern Sedimentary Processes Proximal to a Polythermal Tidewater Glacier Complex, Kronebreen/Kongsvegen, Kongsfjorden, Svalbard, Norway

Climate change effects are expected to be more extreme in the Arctic than at lower latitudes as a result of polar amplification, whereby ice and snow melt reduces Earth's reflectivity and induces increased melting. Given the significant influence of Arctic change on global climate patterns associated with ocean thermohaline circulation and atmospheric circulation, it is important that the effects of climate change on Arctic systems are well understood. Accordingly, the status of such systems must be monitored today so as to generate baseline data upon which future comparisons and predictions can be made. The purpose of this study was to provide such baseline data by characterizing the modern sedimentary processes in front of a tidewater glacier complex on Svalbard, Norway. A series of sediment gravity cores collected proximal to the ice margin were analyzed through x-ray, thin section, and grain size analyses, and were considered in conjunction with local fjord floor morphology.

Nelish Pradhan '10

Ryan Bavis, Biology

In Vitro Single-Unit Nerve Recordings in Hypoxic Conditions from the Carotid Body of Infant Rats Treated to Hyperoxia

I am studying the effects of chronic hyperoxia (~60% O₂) on oxygen sensitivity of the carotid body in new born rats (0 to 8 days old). The carotid body detects arterial oxygen partial pressure. It has a narrow developmental window after birth during which it adjusts to the prevailing O₂ conditions. Chronic exposure to hyperoxia during this period results in decreased O₂ sensitivity. Using electrophysiological techniques the chemoreceptor cells were studied in vitro. Exposure to 24 hours of hyperoxia initially led to increased O₂ sensitivity in 7-day-old rats, which may be caused by reactive oxygen species (ROS). The purpose of my research was to replicate the results seen in one day old rats and also on 7-day-old rats and get at the mechanism behind the increased sensitivity.

Evan Procknow '10

Margaret Imber, Classical and Medieval Studies

Law and Ethnogenesis

The Visigoths, a newly formed and multiethnic assemblage of Germanic peoples, invaded and established successor kingdoms within the Roman provinces of Spain and Gaul. The formation of the Visigothic kingdom reveals the extent to which the Visigoths constructed an ethnic identity. Despite its normative character, the *leges Visigothorum* is informative in this respect. The apparent duality of Visigothic law may suggest that it was an active agent in ethnogenesis. Hitherto, historians have reconciled this duality by asserting that Visigothic law was "personal" rather than "territorial" in its application. However, this duality has nothing to do with ethnicity qua ethnicity; rather

it reflects the longstanding Roman legal dichotomy of Civil and Praetorian Law. In addition, the alleged "Germanic" customs of Visigothic law merely represent the codification of heretofore extra-judicial legal practices. This leads historians to reassess the ethnogenesis of the Germans of the Migration Period.

Baijing Qin '10

Nancy Kleckner, Psychology

Differential Expression of Glutamate Receptor Subtypes in *Helisoma trivolvis* Central Nervous System

Glutamate is a ubiquitous amino acid that serves as a neurotransmitter in both the vertebrate and invertebrate central nervous systems (CNS). In the pond snail, *Helisoma trivolvis*, glutamate is particularly vital to the neural network that controls feeding behavior, in which a modifiable central pattern generator (CPG) is responsible for the rhythmic activation and inhibition of different subunits of neurons (S1-S3), resulting in distinct phases of feeding. Glutamate receptor (GluR) subtypes in vertebrates include AMPA (GluR1-4), kainate (GluR5-7), NMDA, and metabotropic receptors. Previous immunocytochemical studies using α -GluR5/6/7 and α -GluR6/7 antibodies indicate that the GluRs of the known feeding CPG and motor neurons are not kainate-like. Furthermore, both AMPA-like and kainate-like GluRs have been cloned from the *Helisoma trivolvis* CNS. This study uses immunocytochemistry, in situ hybridization based on the two GluR partial clones, and electrophysiology of immunoreactive CPG neurons through intracellular recording to identify and characterize the different GluRs expressed in the CNS. Preliminary findings suggest that a S2 motor neuron, B27, and a S3 motor neuron, B19, express AMPA-like glutamate receptor subtypes, whereas S1 motor neurons are not immunoreactive to vertebrate α -GluR2/3 antibodies. In situ hybridization studies may confirm these results.

Molly Radis '10

Susan Langdon, Psychology

The Effects of Physical Activity on Academic Achievement in Children

Previous research illuminates a relationship between exercise and cognitive functioning in young children. The current study examined this relationship in the context of the Lewiston School System. Goals of the study included a) determining if exercise and academic achievement are positively correlated and b) promoting physical activity in local elementary schools. The study was comprised of three parts. A week-long Pedometer Pilot Program was conducted with 98 students in 5 fourth-grade classrooms. Daily step counts were compared to academic grades and to Northwest Evaluation Association (NWEA) standardized test scores. FITNESSGRAM and NWEA scores of 142 students from 2008 were analyzed to determine if physical fitness can predict academic achievement. Lastly, students at Farwell Elementary School engaged in a movement-based learning intervention for 9 weeks. The Pedometer Pilot and FITNESSGRAM study both indicated that exercise and academic achievement are positively correlated. Students who were more physically active earned better grades and performed better on standardized tests than their peers. The results of the 9-week movement intervention are pending. Taken as a whole, these results indicate that educators should be made aware of exercise's cognitive benefits, and may want to allocate more in-

school hours to physical education and movement-based learning.

Nkese Rankine '11

Rebecca Herzig, Women and Gender Studies

Gender Analysis for a Global Era: New Work in Women and Gender Studies -- see Lisa Hartung '10 for abstract

Katherine Reilly '10

Georgia Nigro, Psychology

The Effect of Playful versus Academic Learning Experiences on Preschoolers' Cortisol Levels

The decline of play in the lives of children has sparked great concern among developmental psychologists and early childhood educators. Although research suggests that children learn best when they are playing, many parents, educators, and policymakers have turned to more direct-instructional programs in the hopes of fostering greater intellectual gains. Some research has shown a link between direct-instructional programs and higher stress levels. I conducted an experimental study to find more compelling evidence about this association. Preschoolers from the Lewiston-Auburn area participated in pairs in an 80-minute study in the developmental lab at Bates College. Half of the participants participated in a learning experience designed to simulate a play-based preschool curriculum. The other half participated in a learning experience designed to simulate a direct-instructional preschool curriculum. Saliva samples were obtained before and after the learning experiences and were later analyzed for concentrations of the stress hormone cortisol. Results may provide stronger evidence about the suggested link between different types of preschool programs and stress levels, giving parents, educators, and policymakers important information to consider as they choose what types of learning experiences are most beneficial for preschoolers.

Matthew Reynolds '10

Robert Feintuch, Art and Visual Culture

Two Experiments in Animation: The God of High Score Legacies and The Rescue Party

I created two short stop-motion animation pieces (1 minute and 30 seconds and 4 minutes and 30 seconds, respectively) during the Short Term and fall semester of 2009. Paper cut-outs were used to create the majority of animation subjects in both pieces; *The God of High Score Legacies* also includes various craft materials such as toothpicks, yarn, and felt. The process of traditional animation, in which the illusion of movement is created by physically reorganizing the objects in the frame, is a laborious and repetitive one; I like to reflect this in the narratives of my films (especially in *The Rescue Party*). I'm particularly concerned with visual composition in these two films, and I found myself emulating the organization of iconographic portraits and manuscript illuminations rather than those typical to film compositions. An objective specific to *The Rescue Party* was to convey the progression of a narrative within a stagnant frame, much like what was accomplished by early manuscript illustrators. Animation is inherently playful; I like to juxtapose this playfulness with sometimes horrifying or dark images.

Hannah Roebuck '10

J. Dykstra Eusden, Geology, and Camille Parrish,
Environmental Studies

Predictions of the Effect of Wetland-Type Soils on the Water Chemistry in the Lake Sunapee Watershed, NH

Understanding the ecosystem controls on the production and accumulation of methylmercury (MeHg) is a pressing issue for both environmental and public health. Certain landcover characteristics affect water chemistry in a watershed, thus predisposing it to MeHg contamination. Of these factors, wetlands have been found as the primary characteristic in predicting concentrations of MeHg in a stream. It is not clear, however, whether 1) total area or 2) percentage of wetland soils in a watershed or 3) the proximity of wetland soils to the sampling site matter most in predicting associated stream water chemistry. GIS modeling was applied to test each of these scenarios in the Lake Sunapee Watershed by overlaying information on the delineation of the Lake's major watersheds, stream sampling sites, soil data from the NRCS, and summarized water chemistry data from each site. Soil composition of each watershed and streamwater data on dissolved oxygen (DO), dissolved organic carbon (DOC), turbidity, and sulfate concentrations were analyzed for correlations and relationships.

Christine Roemer '10

Michael Sargent, Psychology

The Potency of Anticipatory Regret within the Ultimatum Game

The purpose of the present study is to determine if anticipatory regret is powerful enough to outweigh monetary benefit so that participants will forgo utility maximization in order to minimize regret. The participants include approximately 100 Bates College students, both male and female, playing the ultimatum game. Within the ultimatum game, participants are randomly assigned to three conditions: control (no feedback), feedback if rejected, and feedback if accepted. By manipulating the conditions under which participants receive feedback, and therefore possible regret, it is possible to determine if regret aversion is potent enough to outweigh utility maximization, as well as if there are multiple types of regret aversion. Results should indicate that offers made during the ultimatum game are being influenced by a desire to minimize regret more than a need to maximize utility. If the desire for regret minimization is strong enough to negate utility maximization, or at least lessen utility gained, this result would suggest that regret aversion is a powerful determinant of our decisions.

Daniel Rosenzweig '10

Nancy Koven, Psychology

A Look into the Unknown: Viral, Autoimmune, and Nonspecific Encephalitis

Encephalitis is a neurological condition in which the parenchyma of the brain swell as an immune system response to a perceived infection, just as other tissues might. Unlike other bodily tissues, edema in the brain produces intracranial pressure, which, if not successfully treated, can cause permanent damage to the brain and sometimes death. The high proportion (in Australia, 57.2% according to Huppatz et al., 2009) of encephalitis cases reported as of having nonspecific etiology are often assumed to be viral in etiology. However, there may be evidence in the form of patterns of symptoms and recovery that

may uncover a subset within the nonspecific group. This group is likely to have increased recovery rates as well as more moderate symptoms, and may be milder forms of encephalitis of autoimmune forms. The current study will attempt to isolate this subgroup.

Amrita Roy '11

Hong Lin, Physics

Developing a Fiber-Optics Experiment for Advanced Teaching Laboratory

In this project, I am developing an experimental station on fiber-optics. I am looking at the 2 important characteristics of optical fiber: "numerical aperture" and "attenuation."

Elisabeth Russell '10

Francisca López, Spanish

Semana Santa of Seville: A Cultural Analysis

Every spring religious confraternities of Seville, Spain, celebrate the Holy Week (*Semana Santa*) by processing floats representing the Passion of the Christ and the grieving Virgin Mary through the streets. Although the celebration has a basis in the Roman Catholic faith and is a prime example of popular religiosity, it is the secular and sometimes profane behaviors present during the *Semana Santa* of Seville that make it unique. Employing cultural studies as a theoretical approach, this thesis analyzes media representations and various newspaper articles and videos posted on the Internet, focusing on the comments of the articles and videos. Most comments emphasize secular aspects of the processions rather than religious, demonstrating more loyalty to the city of Seville than to Catholicism. The reactions of the people of Seville show that their *Semana Santa* not only reflects a sense of identity and pride, but simultaneously forms these ideas as well. The significance of the *Semana Santa* of Seville extends beyond religion and becomes a manifestation of allegiance for the people of Seville.

Lindsey Scherer '10

Nancy Koven, Psychology

Longitudinal Investigation of Cancer Treatment-induced Dorsolateral Prefrontal Cortex Volumetric Changes Affecting Working Memory Performance

Since the early 1970s, cancer patients treated with chemotherapy have expressed concern over loss of cognitive abilities experienced during and after chemotherapy. Recent studies assessing cognition with neuropsychological testing have indicated subtle but recognizable differences in executive functions and memory. Brain imaging techniques assessing structure, volume, and activation patterns during executive function tasks have implicated abnormalities largely in the prefrontal region. The current study is a longitudinal investigation of breast cancer (BC) patients' working memory deficits as they may relate to structural changes in DLPFC over time. The sample includes 15 female BC patients treated with chemotherapy (CTx+), 15 without (CTx-), and 15 healthy controls (HC) evaluated using structural MRI, neuropsychological testing, and mood evaluation at each of three time points: baseline (BL; post-surgery but prior to radiation, chemotherapy, and/or anti-estrogen treatment), one month post-chemotherapy (M1), and one year (Y1). It is hypothesized that female BC patients treated with chemotherapy (CTx+) without (CTx-), and healthy controls (HC) will not significantly differ at baseline in DLPFC volume or cognitive

function. However, at M1, CTx+ and CTx- subjects will demonstrate cognitive and volumetric decline, but experience a moderate recovery of volume and function at Y1, as compared to HCs who will only present age-related changes in function and volume across the three time points.

Kurt Schuler '10

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Creating an ArcGIS Map of the Mt. Abrams Ski Area

The ski patrol at Mt. Abrams, a family-owned resort in Greenwood ME, is lacking an accurate map of the ski area. Recently, in an effort to attract more adventurous skiers and riders, Mt. Abrams has opened all of its wooded in-bound terrain, increasing the potential for accidents and placing extra strain on the patrol force. The goal of this project is to use ArcGIS to create a detailed boundary-to-boundary map of the mountain's features including trails, glades, chairlifts, t-bars, buildings, terrain parks, and toboggan houses. These features were traced in the field using a Trimble GPS unit and uploaded to georeferenced Maine GIS Catalog images of the mountain. In addition to these physical settings, the map includes possible evacuation routes and high risk areas. This information was collected from current ski patrol members. The finished product will be presented to the Mt. Abrams ski patrol.

Kurt Schuler '10

Michael Retelle, Geology

Monitoring Sediment Transport at the Seawall Beach Complex, Phippsburg, ME

Seawall Beach in Phippsburg, ME, and its adjacent pocket beaches, Little and Ice Box, combine to form a barrier beach complex with an undeveloped shoreline, making it a vital resource for research on the effects of sea-level rise and storm erosion. Understanding the seasonal processes that affect this dynamic system will help to predict inland migration of the beach complex and its potential impact on current anthropogenic structures. Throughout the summer and fall of 2009 and winter of 2010, topographical profiles, activation rod analysis, time-lapse photography, and GPS tracking were used to record sediment transport trends, wave energy patterns, and the Sprague River inlet migration.

Emma Scott '10

Alexandre Dauge-Roth, French

Burundi and Rwanda: A Comparison of Conflicts between Hutus and Tutsis and Where the Countries are Today -- see Ashleigh Musser '10 for abstract

Emma Scott '10

William Low and Anthony Shostak, Museum of Art

The Bates College Museum of Art: A Look at the Experiences and Practices of Student Interns -- see Esther Kendall '10 for abstract

Shawn Sendar '10

Krista Scottham, Psychology

Promoting Cultural Awareness among Adolescents: A Service Learning Experience with the Civil Rights Team

The Lewiston Middle School Civil Rights Team (CRT) aims to reduce the occurrence of bias-motivated violence and tension among students. The Team endorses a safe environment by instituting preventative measures that raise awareness of

ethnicity and race. Research indicates that interracial contact (Allport, 1954) between groups reduces hostility and anxiety, and promotes positive intergroup attitudes, empathy, and trust (Brewer & Gaertner, 2004). In order for intergroup contact to influence the targeted members, several features must be in place. The situation requires acquaintance, equal status, institutional support, and cooperation (Allport, 1954). Based on these elements, the current project encourages interaction between two groups of middle school students in a set of activities suited to promote positive attitudes about the other. Additionally, the research includes an evaluation of the program's effectiveness through focus groups and data collection.

Caroline Servat '10

Katalin Vecsey, Theater

Medea Redux

This Mount David Summit presentation is a live performance of *Medea Redux*, by Neil LaBute, part of an independent study originally performed in March in the Black Box Theatre and directed by Katalin Vecsey, lecturer in theater. *Medea Redux* is a monologue extracted from a larger piece called *Bash*, by LaBute. The other performers of the original piece were Marielle Vigneau-Britt '10, Rory Cosgrove '11, and Drew Gallagher '11.

Lauren Shapiro '10

John Kelsey, Psychology

The Effects of D-cycloserine on Extinction and Reinstatement of a Morphine-Induced Conditioned Place Aversion

Although it is relatively easy to get drug addicts through withdrawal, it has proven difficult to prevent subsequent relapse. Relapse can be induced by environmental cues that were once associated with drug use, such as a particular context. As a result, extinction therapy, in which the cue is repeatedly presented in the absence of the drug or withdrawal, has become a treatment for addiction. However, even following such extinction, relapse can sometimes be induced by re-exposure to the drug, other drug cues, or stress. D-cycloserine (DCS), a co-agonist at glutamatergic NMDA receptors, has been found to improve the rate and effectiveness of extinction of drug-related cues. For my neuroscience thesis, I am attempting to determine if DCS will also enhance the extinction of cues predictive of opiate withdrawal (drug-absent) in rats will enhance extinction and reduce the relapse produced by stress.

Matthew Sherburne '10

Susan Langdon, Psychology

The Role of Self-Efficacy in Fruit and Vegetable Consumption: "Eat Your Colors"

In contemporary America, Americans are facing a health outlook that is characterized by an unhealthy population. In order to combat this serious issue health organizations have looked for ways to correct this problem. One such program is "Eat Your Colors," a diet-intervention program designed to increase fruit and vegetable consumption by using a simple guideline for the users to follow, thus allowing their increasing self-efficacy to increase as a result in increased competence. However this intervention has not been studied in a college population. Additionally, research suggest that amount of information provided to participants can affect their knowledge, thus leading to an increase in self-efficacy. This experiment tests

the "Eat your Colors" program in a college population. Specific attention is paid to the amount of information provided to participants by means of three interventions in order to find the most effective. The results will help researchers better understand nutrition intervention programs in college populations.

Lillian Sheridan '10

Holly Lasagna, Harvard Center for Community Partnerships
Collaborating on a Community Food Assessment: Unraveling Hunger and Food Justice in Lewiston -- see Anna-Frances Chase '10 for abstract

Lillian Sheridan '10

Emily Kane, Sociology

Evaluating the ArtVan: A Child's Perspective

This project reports on the multi-method evaluation of a community arts program for children. It explores the children's perspectives on art, art programs and in particular their evaluations of the ArtVan program at the Lewiston Public Library. ArtVan is a mobile arts program based out of Bath, ME, whose mission is to "service children, teens and adults, providing the arts as a healing agent for safe, creative expression and self discovery." The goal of this project was to create a child-friendly evaluation template, which was interactive and informative. This work reveals the challenges and opportunities connected with doing community-based research.

Navpaul Sidhu '10

Leslie Hill, Politics

United States Involvement in Somalia -- see Tiarra Abell '12 for abstract

Navpaul Sidhu '10

Sue Houchins, African American Studies

Haiti's Quest for Autonomy: Understanding the Sociocultural and Economic Effects through a Brief Survey of Caribbean Literature -- see Vantiel Duncan '10 for abstract

Michelle Silverman '10

Krista Scottham, Psychology

The Expansion of Dialectical Behavior Therapy in an Outpatient Setting to the Lewiston-Auburn Community

Dialectical Behavior Therapy (DBT) is an evidence-based treatment, which blends standard cognitive behavioral therapy with Eastern meditation practices. Although previous research has demonstrated its effectiveness with adolescents suffering from a wide range of psychological disorders, DBT is not currently offered as an outpatient service in the Lewiston-Auburn community. In order to provide therapeutic treatment to the increasing number of at-risk youth in the community, a local group home for teens is preparing a grant proposal for state funding, so that DBT can be offered as one of its outpatient services. The present study assessed how to best implement this program by investigating how DBT has been adapted for adolescents, barriers associated with DBT for adolescents, local adolescent commitment to undergoing therapy for their target problems, and parent and adolescent interest in DBT techniques. Results support interest in DBT among community members and indicate that many local youth are not only exhibiting negative behaviors that DBT has been shown to improve, but that they are motivated and ready to commit to therapeutic

treatment. Implications and limitations of these results are discussed.

Sara Sinicropi-Yao '10

Sawyer Sylvester, Sociology

Accommodating HIT for Elderly Users: The View from a Nursing Home in Auburn, ME

Geriatric patients represent one of the fastest growing sectors of our population. Health information technology (HIT) has been proposed as a solution to address the complex health care needs of geriatric patients. The goal of this study was to document geriatric patients' perceptions regarding their health care and the relation between HIT and quality of health-care delivery. In-depth interviews were conducted with 10 older adult patients and 2 health-care-affiliated professionals at a nursing home located in Auburn, ME. Questions posed in structured interviews focused on four areas: 1) history of their doctor-patient relationships and how this relationship may have changed or evolved over time, 2) current opinions about the health care system, 3) opinions about technology and HIT, and 4) whether they felt that HIT was beneficial to their personal health care. Patients' responses were evaluated using a rubric designed to assess the patients' attitude toward their relationship with their doctors. Additional response trends among patient interviews were determined. Patients overwhelmingly agreed that the doctor-patient relationship has changed and evolved as a response to an increasing need for specialization within geriatric medicine. Overall, patients were positive about their current quality of health care, though there were areas identified in need of improvement. One such area was the patient's involvement in the treatment decision-making process. There was tremendous support for the implementation of HIT from the patients. HIT systems that were user-friendly and tailored to the needs of the geriatric patient population would benefit the quality of geriatric health care. With the growing geriatric patient population requiring complex care within a fragmented health care environment, implementation of HIT provides a novel system to facilitate interactive decision making between patient and doctor as well as to monitor, coordinate, and follow patient progress in a holistic manner.

Scott Sinisgalli '10

Georgia Nigro, Psychology

The Effect of Cognitive Dissonance, Fear Induction, and Point of View on Driving Attitudes and Behavior

Risky and aggressive driving among the late-adolescent male cohort is of great contemporary public-health concern as young males are most likely to be involved in traffic accidents and fatalities. The present study uses two experiments to assess the effectiveness of interventions in reducing dangerous driving behavior among young males. In the first experiment, participants are randomly assigned to one of six writing-based conditions formed by crossing the two variables of intervention type (a dissonance-based intervention, a fear-induced intervention, or an expressive writing control condition) with perspective type (first-person field-perspective vs. third-person observer-perspective). Driving attitudes are assessed using a comparison between pre-intervention and post-intervention scores on two scales. The second experiment evaluates the degree of behavior change by comparing students' performance on a driving simulator prior to and after exposure to an intervention. Results are discussed in context as findings may

suggest new efficacious ways to decrease hazardous driving and the associated health risks in the young adult male cohort.

Haley Sive '12

J. Dykstra Eusden, Geology, and Camille Parrish,
Environmental Studies

Dams for Towns: The Stagnation of Farming Culture in Delaware County, NY

New York City's water supply system is among the most extensive municipal water systems in the world. It serves over 8 million people daily and holds about 580 billion gallons (The City of New York 2010). The Pepacton Reservoir, built in 1955, is the largest reservoir in the system and supplies almost 25% of the total drinking water in New York City. During its construction, 943 people were forced to move from their homes in the towns of Arena, Pepacton, Shavertown, and Union Grove. These small, rural farming communities disappeared, reflecting a general trend within United States agriculture during the 1900s. The goal of this project is to represent spatially these changes in agriculture during the 1900s for Delaware County. The analysis is based on historical census data available from the U.S. Census Bureau in shapefile format and statistical, agricultural data from Delaware County and the U.S. Census of Agriculture, which is not yet georeferenced. Joins of nonspatial data from census to spatial data layers from the Seamless Server form a major component of the analysis, along with georeferencing maps available from Delaware County of the towns and farms.

Lauren Slipp '10

John Kelsey, Psychology

The Role of Dynorphin in Mediating Opiate Withdrawal and Reinstatement in Rats

The endogenous opiate dynorphin stimulates kappa opioid receptors (KORs), which have been implicated in mediating the aversive effects of stressful events. For example, in our lab blockade of KORs prior to opiate withdrawal reduces withdrawal symptoms. However, blocking KORs prior to induction of drug dependence has been shown in some studies to increase opiate withdrawal. To examine the time course of these effects, rats were pretreated with nor-BNI to block KORs 24 hours prior to initiation of morphine dependence. Rats were then be subjected to naltrexone-induced withdrawal and their subsequent aversion for the location in which withdrawal occurred was measured. Nor-BNI had no effect on the aversion at this time point. A second experiment will be conducted to investigate the hypothesis that dynorphin may mediate stress-induced reinstatement, an animal model of relapse. Additional morphine-dependent rats will undergo the same procedures as in Experiment 1 followed by extinction trials, in which animals are exposed to the withdrawal location in the absence of withdrawal. Rats will then be administered nor-BNI 24 hours prior to restraint stress and tested for reinstatement of the extinguished aversion. Together, these data will help elucidate the role of dynorphin in mediating opioid withdrawal and relapse.

Benjamin Smeltzer '10

Lilian Childress, Physics

Nuclear Spins in the Diamond NV Center

The nitrogen-vacancy (NV) impurity in diamond is recognized as an attractive candidate for applications in quantum computing. The focus of our work primarily concerns three

different nuclear spins: the isotopes ^{14}N and ^{15}N of the NV nitrogen atom, and proximal ^{13}C nuclear spins. We investigate NV's with proximal ^{13}C spins at different discrete coupling strengths, measuring the strength of interaction with the electron spin of the NV center. We also present measurements of the coherence properties of the nitrogen isotopes.

Anne Smith '10

Robert Farnsworth, English

Poetry Reading -- see Amelia Harman '10 for abstract

Laura Smith '10

Todd Kahan, Psychology

The Effect of a Mood Induction on the Emotional Stroop Task

Gilboa-Schechtman, Revelle, and Gotlib (2000) found a mood congruency effect where a participant's affect interacted with word valence in the emotional Stroop task. However, this study did not control for varying lexical characteristics in all word lists, a factor which was later determined to be of importance by Kahan and Hely (2008). Upon controlling for word frequency, word length, and orthographic neighborhood as well as word valence, results indicated a significant interaction of word valence and word frequency on participants' response times. Specifically, participants had the slowest times when responding to low frequency, emotionally negative words. The current study altered the moods of 123 participants in order to investigate whether the emotional valence of words presented in a Stroop task interacts with mood and whether this differs depending upon the frequency of the words seen.

Mark Stehlik '10

J. Dykstra Eusden, Geology, and Camille Parrish,
Environmental Studies

The Origins and Costs of the Fruits Served throughout the Year in Bates' Dining Hall

Bates College is committed to increasing the percentage of its food that is organic and local (self-defined as the State of Maine) in order to become more sustainable. With data from the USGS National Map and Bates College Dining Services, I used ArcGIS to map the origins and costs of the fruits served throughout the year in Bates' dining hall. I also used GIS to calculate the distance each type of fruit traveled and the estimated CO_2 emissions from transportation. Colored proportional symbols were used to illustrate this relationship. In addition, I mapped the costs for local versus distant locations, because budget is an important factor for Commons. This map showcases Commons' commitment to local food and illustrates where many foods that are unavailable locally come from, enabling diners to be conscious of the way they are affecting the world as they eat a meal.

Allison Stiles '10

Georgia Nigro, Psychology

Enhancing Preschoolers' School Readiness through Structured Dramatic Play

Early education programs have gained increasingly more funding and attention as research demonstrates their value. Studies have revealed notable short- and long-term positive effects on school readiness skills that children can gain through preschool programs. Research identifies executive functioning, which includes higher cognitive thinking processes such as self-regulation, problem solving, planning, and goal-oriented

thinking, as particularly valuable in preparing children for school. One method of enhancing executive functioning is through the use of adult-guided, structured dramatic play (role-playing). In an attempt to strengthen the school readiness of children in the Auburn public preschool program, I implemented a four-week long play intervention in the preschool classroom at Walton Elementary School. The intervention involved guiding a group of five students through various role-playing scenarios for 25- to 30-minute periods, four days a week. In order to maximize the benefits of the dramatic play, the researcher led the students through planning, doing, and reviewing their actions during the play period. The Behavior Rating Inventory of Executive Function-Preschool Version (BRIEF) was used before and after the intervention to assess the effects of the intervention on the executive functioning of the experimental group compared to the control group. The results of this study could provide suggestions for an effective addition to the Auburn preschool curriculum that would have the potential to better prepare preschool students for school.

Kate Stillman '12

Dennis Grafflin, History

Writing History: Discovering the Story of Tibet and the People's Republic of China, 1950-1970

Historical study strives to discover the truth, a purpose often thwarted because the victor determines history. A piece of history struggling to be written concerns the interactions between Tibet and China from 1950 to 1970. Both the Chinese and the Tibetans have expressed different versions of the events that took place during that period of time. Most notable are the differences in their perceptions of old Tibetan society, the Chinese rise to power in Tibet in 1950, the flight of the Dalai Lama in 1959, and the reforms that took place in Tibet prior to and during the Cultural Revolution. These differences in the historical record reflect the divisions not only between the Chinese and the Tibetans but within China and Tibet. It is only by peeling away the layers of exaggeration designed to elicit support for a particular side that the truth can be determined.

Huong Sutliff '13

Lavina Dhingra, English

Image and Sound: Reading and Writing Lyric Poetry -- see Kathryn Collier '13 for abstract

Andrea Svigals '10

William Low and Anthony Shostak, Museum of Art
The Bates College Museum of Art: A Look at the Experiences and Practices of Student Interns -- see Esther Kendall '10 for abstract

Hans Tobiason '10

Amy Douglass, Psychology

Eyewitness Interview Directions

Eyewitness misidentification testimony was a factor in 74 % of post-conviction DNA exoneration cases conducted by the Innocence Project in the United States, making it the leading cause of these wrongful convictions (Innocence Project, 2010). The current study examines how manipulating the directions given to laboratory eyewitnesses will affect their responses to the interviewers' questions. The variable manipulation takes the form of two sets of instructions for the eyewitness. One set instructs the eyewitness to only give information they are

absolutely positive about while the other set instructs them to express any and all information they have for the questions they are asked. The goal of the study is to try to figure out whether direction type in an eyewitness interview affects the accuracy and informativeness levels as well as the grain size of submitted information from eyewitnesses.

Eleanor Torrey '10

Alexandre Dauge-Roth, French

Hutu Women's Role Both in the Genocide of the Tutsis in Rwanda and in Its Rehabilitative Aftermath -- see Jennifer Kress '12 for abstract

Lila Totino '10

Katherine Mathis, Psychology

The Effects of Environmental Infantilization on Perceptions of the Elderly

With the population of the world aging rapidly, issues related to geriatric health care are gaining priority in the minds of citizens and policymakers. Infantilization of the elderly is one recurring theme within eldercare institutions that must be addressed. Infantilization, also termed patronization, describes any instance in which someone treats an older individual as a child, thereby discrediting her lifetime of experiences. Some kinds of infantilization, such as speech infantilization, have been studied in recent years, with findings indicating that people who view elders being verbally infantilized rate these elders as less competent, less alert, and weaker than those who viewed elders as not verbally infantilized (Giles, Fox, and Smith, 1993). However, little is known about how environmental infantilization affects perceptions of the elderly. Thus, the current study employed a 2 (room condition: infantilized vs. noninfantilized) x 2 (ageism: high vs. low) between subjects experimental design in an attempt to determine how environmental infantilization affects positive and negative perceptions of the elderly. Contrary to the hypotheses, neither room condition nor ageism significantly impacted composite positive or negative trait ratings of a hypothetical elder. However, ratings of some individual character traits, such as independence, significantly differed across room condition. Implications of these specific findings and directions for future research are discussed.

Emily Treat '10

Kathryn Low, Psychology

The Experiences of Adolescents with Parents Deployed in the Military

The current study explores the experiences of children who have a parent deployed in military combat. Previous published research investigating the effects of military deployment on families and children has been limited by methodology. In order to provide a broader knowledge base and more depth, researchers have called for more qualitative investigations into the topic. The present study answers this call by using both qualitative and quantitative methodologies. 12 to 15 high-school-aged (14 to 18) adolescents were interviewed and asked open-ended questions about the experience of having a parent who has been deployed. These data were analyzed by using grounded theory to discover the children's experiences of military deployment (Strauss and Corbin, 1998). Using content analysis of the interview transcripts, the researcher looked for themes that are reported in the literature, such as depression and

anxiety. In addition, participants were asked to complete questionnaires including the Revised Children's Manifest Anxiety Scale (RCMAS), the Child Depression Inventory (CDI), and the Inventory of Parent and Peer Attachment (IPPA) to compare participant scores to national norms of anxiety and attachment, respectively. Further qualitative research could investigate the extent to which male and female adolescents vary in their experiences.

Benjamin Trook '10

Alexandre Dauge-Roth, French

Burundi and Rwanda: A Comparison of Conflicts between Hutus and Tutsis and Where the Countries are Today -- see Ashleigh Musser '10 for abstract

Helena Turner '10

John Kelsey, Psychology

Levodopa-Induced Dyskinesia: Development and Treatment in a 6-OHDA Rat Model of Parkinson's Disease

Parkinson's disease (PD), a neurodegenerative disease that destroys the dopamine neurons in the nigrostriatal bundle, produces severe and debilitating symptoms including tremors, rigidity, and difficulty initiating movements. First line treatment tends to consist of L-DOPA, a dopamine precursor that initially alleviates these symptoms. However, over time many patients on L-DOPA develop excessive involuntary movements called L-DOPA-induced dyskinesias (LID). In order to evaluate the ways in which dyskinesias develop, we have used a rat model of PD and are testing animals on levels of both LID and forepaw stepping as a measure of the PD symptoms after treating animals with either 10 mg/kg L-DOPA over two weeks or with 35 mg/kg L-DOPA acutely. After dyskinesias have been stabilized, drugs that have been shown to affect PD in other models, including the cannabinoid antagonist rimonabant, the opiate receptor antagonist naltrexone, the 5HT1A agonist 8-OH-DPAT, the adenosine A2A antagonist caffeine, and the dopamine D1 antagonist SCH 23390 will be administered to determine the impacts that these drugs have on Parkinsonian symptoms and on LID in groups of rats receiving different doses of L-DOPA.

Obichukwu Udeh '12

Elizabeth Eames, Anthropology

The Oil Crisis in Nigeria and its Impact on the Nigerian Population -- see Karl Alexander '12 for abstract

Ketevan Vashakidze '11

Carl Schwinn, Economics

Nonresidential Fixed Capital Investment

Investment in private nonresidential fixed capital has been the subject of study for many economists. Several interesting models, like generalized accelerator model, accelerator cash flow model, neoclassical model, modified neoclassical model, and q model have been developed for estimating investment behavior. My study focuses on the generalized accelerator and accelerator cash flow models. Through the generalized accelerator and accelerator cash-flow models I try to explain investment behavior. Based on the company's financial data I consider three basic questions: 1) How well do those theoretical models explain the variations in nonresidential fixed investment? Are those theoretical models supported by real financial data? 2) Which of the explanatory variables has the highest statistical significance? 3) Which model describes the

investment in private nonresidential fixed capital better, the generalized accelerator model or the accelerator cash flow model?

Sarah Vigne '12

Sylvia Federico, English

Tolkien's Use of Consolation in The Lord of The Rings: Fairy-story as Elegy

In *The Lord of the Rings*, Tolkien emphasizes the nature of a fairy-story as providing consolation for death, thus showing that fairy-story is a type of elegy. The genre of fairy-story, with the medieval text "Sir Orfeo" as an example, is seen to provide an elegiac function through consolation for death. *The Exeter Book Elegies* provide a typical example of medieval elegies and their close connection to consolation in the final defeat of death, particularly in a religious sense of a reward in Heaven. Tolkien discusses this type of consolation in his essay, "On Fairy-stories," more specifically linking this consolation to fairy-stories. In his monumental work *The Lord of the Rings*, Tolkien creates a modern example of a fairy-story that contains this type of consolation in many ways, and thus rises to the level of an elegy.

Rebecca Waldo '11

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Mapping the Northward Expansion of Bird Migration as a Result of Climate Change

Over the past few decades the climate of the Earth has been noticeably changing: the annual average temperature has shown a steady rise. Species respond to this in different ways. Some die off, some flourish, while others change their normal habitat and migration patterns. Birds are one of the sensitive animal groups and hence serve as a bio-indicator to climate change. The Audubon Society has data from bird counts over the past 40 years that reveal that birds have moved their range significantly northward. Using ArcGIS with data from bird counts, temperature measurements and a U.S. geographic database, I mapped the change in home range for selected migratory bird species in the United States. Additional maps were created showing the effect of temperature change and other potential variables on bird migration.

Rebecca Waldo '11

David Das, *Off-Campus Study Program*

The International Lens: The Art and Ethics of Photography Abroad -- see Stephanie Cabot '11 for abstract

Qinglan Wang '10

Robert Farnsworth, English

Poetry Reading -- see Amelia Harman '10 for abstract

Louis Watanabe '12

Elizabeth Eames, Anthropology

The Oil Crisis in Nigeria and its Impact on the Nigerian Population -- see Karl Alexander '12 for abstract

Edward Wells '13

Elizabeth Eames, Anthropology

The Impacts of Tourism on the Economy of Tanzania -- see Lindsay Blitstein '12 for abstract

Julia Wilson '10

Ryan Bavis, Biology

The Effects of Perinatal Hyperoxia on the Expression of Neurotrophic Factor Receptors in the Rat Carotid Body

The mammalian hypoxic ventilatory response (HVR) is a cardiorespiratory reflex that maintains tissue O₂ homeostasis in response to brief exposure to hypoxia as a result of changes in O₂ supply. Most studies have concluded that exposure to hyperoxia (60% O₂) following birth alters the development of the carotid body, the main peripheral chemoreceptor responsible for sensing changes in oxygen levels in rats and other mammals. Brain-derived neurotrophic factor (BDNF) and glial cell derived neurotrophic factor (GDNF) are neurotrophic factors that are responsible for regulating the survival and differentiation of cells throughout the body, including the chemoreceptor cells that make up the carotid body. Decreased expression of one or both of these neurotrophic factors could lead to cell death and/or reduced cellular proliferation. 3-day-old rats exposed to hyperoxia following birth exhibit decreased expression of BDNF protein in carotid body tissue, however, protein levels of GDNF did not decrease. The cells of the carotid body express tyrosine kinase B (TrkB) and receptor tyrosine kinase (Ret), receptors to BDNF and GDNF. mRNA studies have shown changes in the levels of TrkB and Ret in the carotid body tissue of 3-day-old rats after exposure to perinatal hyperoxia. The purpose of this study was to determine the protein expression of TrkB and ret in 3-day-old rats exposed to hyperoxia and to compare this expression with the mRNA expression of these receptors observed in previous studies. If the protein expression of TrkB is not upregulated in rats exposed to hyperoxia, it is likely that decreased levels of BDNF are responsible for the impaired carotid body development associated with these hyperoxic conditions.

Andrew Wood '11

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Jogging Routes: GIS Mapping of Five Loops in Lewiston, ME

GPS samples were taken on five local jogging routes beginning and ending at Merrill Gymnasium and incorporated into ArcGIS. Line features were added to GoogleEarth maps, and changes in elevation were displayed as topographic profiles. Special attractions along the routes (e.g., Throncrag Bird Sanctuary, Androscoggin River) were marked with feature polygons. Each route was evaluated based on its distance and topographic profile and assigned a color-coded difficulty ranking. This map will be posted in Merrill Gymnasium for the use of students, faculty, staff, and the Lewiston community.

Nathalie Woolworth '10

Charles V. Carnegie, Anthropology

The Local Significance of Global Climate Change: A Study of Environmental Impacts and Meaning in Pirané, Argentina

In Pirané, Argentina, a city of 18,000 located in the northeast province of Formosa, rainfall has decreased by two thirds, frost cycles have become unpredictable, and the intensity of heat in summer and cold in winter have increased over the last five years. The way these environmental changes are discussed by locals in relation to global climate change sheds light on the variability and elasticity of the larger concept. To Pirané's inhabitants, whose livelihoods directly depend on natural resources, climate change is not a global problem understood through the lens of Western science or international politics, but

a plethora of real local impacts. Understanding the local impacts and meaning of climate change in both local and global contexts and recognizing the variability in perspectives expressed through discourse and action are crucial to facilitating future local adaptation as well as equitable global response to climatic change.

Ethan Yackulic '12

J. Dykstra Eusden, Geology, and Camille Parrish, Environmental Studies

Locations, Degree of Difficulty, and Geologic History of the Bouldering Sites at Bradbury Mountain

For all of the recreational activities available within the 610 acres of land at Bradbury Mountain State Park, the exceptional bouldering potential of the area has gone relatively unnoticed. The purpose of this project is to create an ArcGIS map of the bouldering sites at Bradbury Mountain that show their location, degree of difficulty, and geologic history. Each bouldering location that meets the criteria of a specified height and angle of incline is marked by a GPS point. Collectively the points overlay a topographic map of Bradbury State Park that also displays its hiking trails. The map also includes the lowest impact pathway to the bouldering sites to diminish the environmental degradation of the vegetation, a common problem at popular bouldering/climbing destinations.

Krystina Zaykowski '10

William Low and Anthony Shostak, Museum of Art

The Bates College Museum of Art: A Look at the Experiences and Practices of Student Interns -- see Esther Kendall '10 for abstract**Alexia Zhang '10**

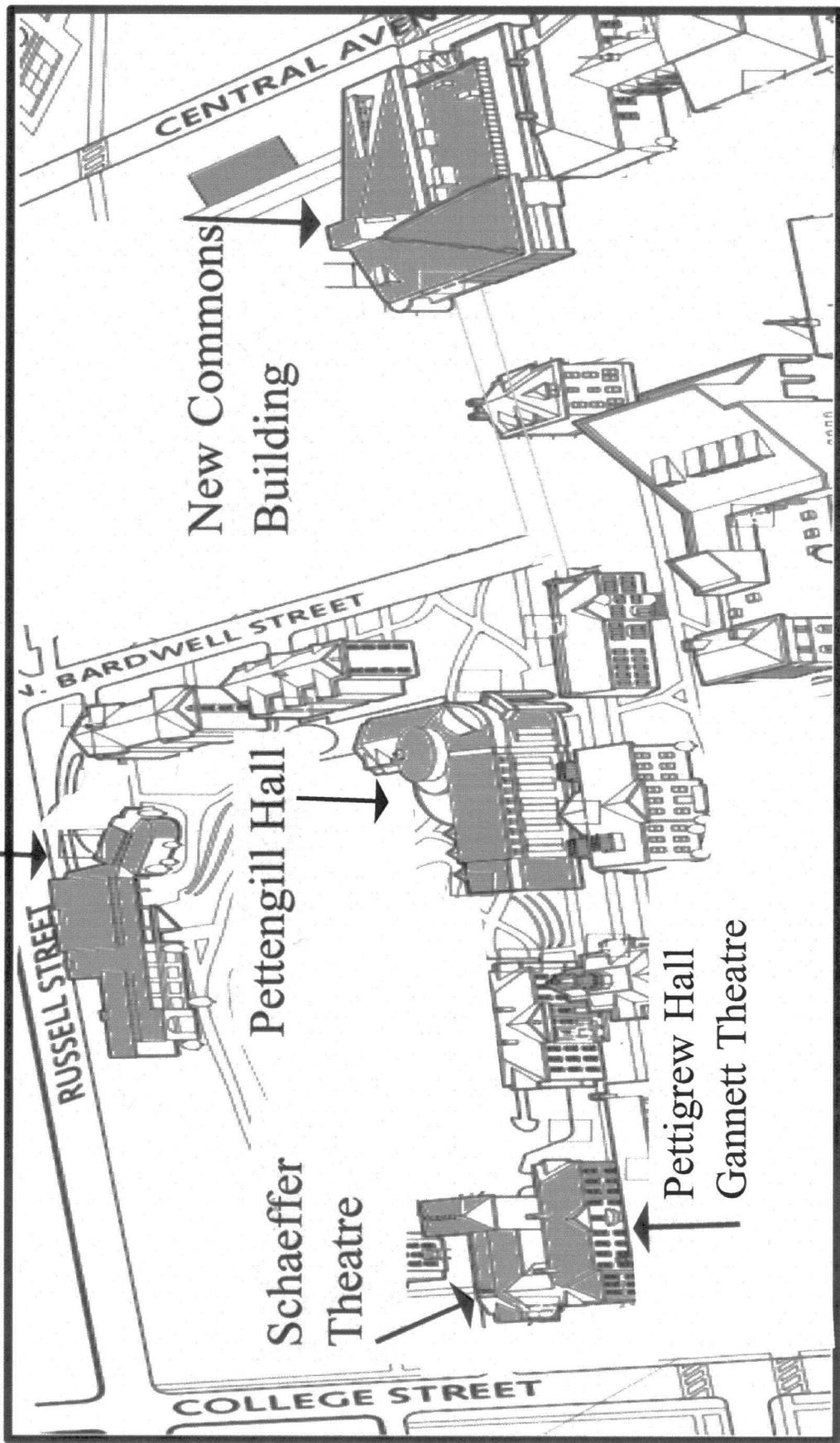
Nancy Kleckner, Biology

Characterization of the Modulatory Role of Buccal A Cluster Cell Group on the Feeding Central Pattern Generator in the Pond Snail, *Helisoma trivolvis*

The feeding central pattern generator (CPG) of the pond snail *Helisoma trivolvis* is a model system to study neural networks. *H. trivolvis* feed in a triphasic pattern: protraction, retraction, and hyperretraction of a toothed radula. The CPG is comprised of three groups of interneurons, S1, S2, and S3, which innervate corresponding motor neurons that drive the tripartite feeding mechanism. The main excitatory transmitter glutamate patterns the feeding CPG, which is thought to undergo further modulation through a network of cells termed the Buccal A Cluster (BAC). BAC cells have two main effects on the CPG: inhibiting phase 3 firing (leading to egestion) and induction of non-phase 2 synaptic inputs onto the CPG (leading to substrate cleaning). Some BAC cells overlap with a group of cells immunoreactive to antibodies that recognize GluR 5, 6, and 7 receptor subunits. The purpose of this study is to determine the connectivity between a select group of BAC cells and the feeding CPG. Dual recordings from a BAC cell and neuron B19, a well-studied neuron within the CPG, elucidate connectivity between the BAC cells and the CPG. The use of high-divalent saline eliminates polysynaptic connections so direct BAC/B19 connectivity is revealed. BAC neurons are filled with a fluorescent marker to identify morphology (to classify BACs by type), and stained with the α -GluR5/6/7 antibody. Immunocytochemistry and fluorescence microscopy characterize the morphology and location of the BAC and α -GluR5/6/7-IR cells.

Campus Map

Olin Arts Center



New Commons
Building

RUSSELL STREET

BARDWELL STREET

COLLEGE STREET

Pettengill Hall

Schaeffer
Theatre

Pettigrew Hall
Gannett Theatre