

9:30–10:40am

Cross-cultural Research**Construction of Gender:
Insight into Japan and Korea (panel)**
Science Center 396

Gender is a social construct expressed by each individual in accordance with a social standard. This panel examines native portrayals of gender in creative outlets, and the use of language and other social behavior, to examine the expression of gender in modern Japan and Korea.

Real Men Wear Sequins: Performing Gender on the Takarazuka Stage

Maureen E. Wynne '09, Economics and Japanese Language and Literature
ADVISOR: *Eve Zimmerman, East Asian Languages and Literatures*

Japan's all-female Takarazuka Revue has been staging large-scale musicals to mostly female audiences for almost 100 years. Using makeup, costumes, and movement, Takarazuka actresses create stylized portraits of both genders that say much about societal perceptions of what constitutes the "ideal" man or woman. However, are these representations static? Changes in the Takarazuka repertoire over the past 15 years could be a reflection of a greater redefining of gender roles in Japanese society as a whole. This presentation will explore the conventions of gender construction on the Takarazuka stage and how they have been applied to recent traditional and less traditional roles.

An Analysis of the Language of Societal Misfits in the Film *Oasis*

Jenny S. Lee '09, Cognitive and Linguistic Sciences
ADVISOR: *Sun-Hee Lee, East Asian Languages and Literatures*

This study investigates the relationship between language and gender in modern Korea based on a set of discourse data from Lee Chang-Dong's film *Oasis*. Constructing a complex image of marginalized individuals, the film calls attention to various issues surrounding gender, lan-

guage, and disability. With a focus on four discourse variables—question-and-answer sequences, expletives (profanity), honorifics, and indirection—the study aims to identify stereotypes associated with female vs. male speech and explores the role of disability in their perpetuation. The major questions addressed by this film-based linguistic analysis are as follows: 1) Are the disabled subject to the same language-related gender stereotypes that characterize the speech of nondisabled men and women (e.g., women's speech is "powerless" and/or "cooperative")? and 2) can physical disability, both in *Oasis* and more generally, in Korean society and elsewhere, be a hyperbolized expression of femininity itself?

**Are the Gay Guys Uniquely Gay?:
Cross-culture Influence on Gender Identity and Expression**

Laura M. Corser '10, East Asian Studies and Political Science
ADVISORS: *Eve Zimmerman, East Asian Languages and Literatures, and Sun-Hee Lee, East Asian Languages and Literatures*

Over the last 25 years or so, the popular culture exchange between Japan and Korea exploded. This exchange has led to an increasing intersection of cultural attitudes towards different individuals in today's society. This study analyzes both the fictional and nonfictional cross-cultural influence of each country's attitude toward gender, language, and sexuality through points of shared contact. More specifically, it strives to view a few different examples of cultural attitudes towards homosexuality in Japan versus that in Korea through the analysis of language and other social behavior displayed in points of cultural intersection: the popular Korean drama *Coffee Prince*, the Japanese and Korean versions of *Antique Bakery*, and pop-culture figure Harisu.

Literature and the Arts**Why There Are Indirect Speech Acts: A Response to Bertolet (panel)**
Pendleton West 117

Shan Shan Tam '10, Philosophy and Architecture, Kimberly Goyzueta '11, Cognitive and Linguistic Sciences, and Margaret Hall '11, Psychology
ADVISOR: *Mary Kate McGowan, Philosophy*

Suppose a diner asks, "Can you pass the salt?" Although her utterance is literally a question (about the physical abilities of the addressee), most would take it as a request (that the addressee pass the salt). The request is performed "indirectly" by way of "directly" asking a question. Accordingly, this utterance is known as an indirect speech act. On the standard account of such speech acts, a single utterance constitutes two distinct speech acts. On this account then, "Can you pass the salt?" is both a question and a request. In a provocative essay, Rod Bertolet argues that there are no indirect speech acts. According to Bertolet, "Can you pass the salt?" is only a question. Using what we learned in Philosophy of Language, we argue against Bertolet and argue for the existence of indirect speech acts.

Wit and Wellesley: Taking Ourselves Less Seriously (long performance)
Schneider Theatre, Black Box

Lynne Adams '09, English and Middle Eastern Studies, Claire Ayoub '11, Middle Eastern Studies, Mary-Katherine Batson '10, English, Nisha Bedi '10, Art History, Sarah Case '10, English, Kat Chen '12, Missy Ford '09, Political Science and Philosophy, Haley Harris '12, Lilli Johnson-Moffet '11, English, Olivia Kingsley '11, English, and Simi Oberoi '11, Political Science
ADVISOR: *Sarah Wall-Randell, English*

To making fun of "that girl," to making fun of society girls, to making fun of each other, Dead Serious has been mining the veins of comedy gold since 1066 C.E. But



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making it all up isn't all fun and games. In their Ruhlman debut, *Dead Serious* presents an insightful yet frivolous, enriching yet not-for-profit, intelligent yet not, and above all sustainable and digestible look into the innards of improv. Come observe the elusive and endangered comedy improv troupe in their natural habitat, as they not only perform what they're known for but all teach the pillars of comedic improvisational theatre. *Dead Serious*. For *Serious*. (Performance sponsored by the letters "D" and "S" and also audiences like you....please?)

César Franck and His Violin and Piano Sonata (long performance) Pendleton West 220

Pui Man Rosalind Lai '11, Neuroscience, and Jane Park '11, Biological Sciences
ADVISOR: *Jan Pfeiffer, Music*

The nineteenth-century Romantic Era is characterized by its passionate and expressive nature, and its unlimited imaginative and fantastical possibilities. In Belgium, a dominant force in music at this era was César Franck (1822–1890). Over his lifetime, Franck's compositions included operas, symphonies, organ works, and the Violin and Piano Sonata in A major, being among Franck's best-known compositions.

The term "sonata", in Latin literally means a piece to be played as opposed to being sung. Sonatas of the Romantic period retained the musical form of the Classical Sonatas, but emphasized the emotional possibilities that were never achieved before. Franck's Sonata in A major (1886) is a perfect example of this sonata of the Romantic period. Franck uses the cyclic form in which same musical themes are developed throughout the piece, resulting in a unity among the four movements.

Art, Feminism, and the Home: Domesticity Reexamined (exhibition) Jewett Art Center, Student Gallery

Brittany Sundgren '09, Studio Art
ADVISOR: *Phyllis McGibbon, Art*

My independent studies in printmaking this year have explored issues of feminist art. Throughout the year, I have been considering the concept of home and belonging by viewing objects through a feminist lens. I wanted to explore and present these ideas using different visual formats, including handmade books, prints, sewing, and performance. Along the way, I have become particularly interested in traditionally feminine objects associated with the home: aprons, spools, teapots, and the like. Currently, we are seeing a kind of new domesticity, or reclaiming of domesticity emerge; motifs and styles reminiscent of those used in the 1950s and '60s are popular once again. This, in conjunction with my studies, has led me to create a dollhouse that reconsiders the ideas of feminine objects and their place.

Exiles at Home (short talks) Science Center 277

A Young Author's Potential: Exploring Yukio Mishima through His Debut Work

Maya Katzir '09, Japanese Language and Literature
ADVISOR: *Eve Zimmerman, East Asian Languages and Literatures*

The popular yet controversial Japanese author Yukio Mishima submitted his first work of fiction for publication in 1941, at the age of 16. "A Forest in Full Bloom," a highly developed piece of short fiction, touches upon elements of Mishima's childhood, while also using strong metaphors to explore the world around him. Through translating his work from Japanese to English, I have been able to further appreciate the linguistic subtleties that abound in his writing. In my presentation, I would like to elaborate on how his writing connects to both his own story and to Japanese society during a vital turning

point in its history, as well as share some of the difficult choices I faced during the translation process.

¿Qué hago yo aquí?: Fictional Representations of Latin American Immigration to Spain and the U.S.

Megan Briggs '09, Comparative Literature
ADVISOR: *Elena Gascón-Vera, Spanish*

The United States and Spain have distinct histories of immigration: whereas the U.S. has always been a country of immigrants, Spain has traditionally exported people abroad, and it has only become a recipient of immigrants in the last two decades. Nevertheless, immigration is a touchy subject in both countries, with heated debates not only in politics but also on the streets. This presentation summarizes the findings of my senior honors thesis, which analyzes the fictional yet realistic representations of the Latin American immigrant experience in three novels, two from the US and one from Spain. All of them pay special attention to the complex realities faced by children and adolescents, especially the conflict between integration and tradition.

Dirasat Al-Adabiyat Al-'Arabiyya: Discovering Arabic Literature at Wellesley

Liz Stickney '09, Middle Eastern Studies and French
ADVISOR: *Louise Marlow, Religion*

After four years of Arabic study both at Wellesley and abroad at Middlebury, in Egypt, and in Morocco, two students decided to explore Arabic literature in order to continue their progress in mastering the language. Structured around informal weekly meetings, discussions of contemporary literary works by writers from Taha Hussein to Hanan Al-Shaykh were held in Arabic, enabling students to practice the language by speaking about its literature. Using this untraditional, independent, and informal setting, students were able to focus specifically on their interests and needs in the spirit of salon-style learning without the commitment

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of taking a course for academic credit. Through this experience, students not only desired to gain an appreciation for Arabic literature and a greater level of proficiency in the language, but also hoped to encourage further development of the Arabic program at Wellesley.

Political Development

War, Nationalism, and Exclusion (short talks) Pendleton East 239

The Invisible Wounds of War: Psychological Casualties of U.S. Military Engagement

Vanessa Arslanian '09, Political Science
ADVISOR: *Ivan Arreguín-Toft, Political Science*

Seven years since the October 2001 deployment to Afghanistan and five since the commencement of U.S. operations in Iraq, active duty servicemembers and veterans of these conflicts continue to face a host of physical and mental health challenges. RAND Corporation conservatively estimates that of 1.64 million troops deployed, about 18 percent suffer from major depression or Post-Traumatic Stress Disorder and 20 percent experienced traumatic brain injury during deployment. Yet these “invisible” injuries are hardly new: from the Civil War’s “soldier’s heart,” to World War II’s “shell shock,” the psychological after-effects of combat exact an even greater toll on those who have already sacrificed more than enough for our country. In an effort to better inform government decision-making before, during, and after war to limit these tragedies, I examined different factors contributing to psychological casualties—including domestic perceptions of the conflict and veteran care—from the Korean War until today’s engagements.

History of the Use of Precision-guided Munitions

Tiffany Howard '09, History and Political Science
ADVISOR: *Guy Rogers, History*

The United States, without a doubt, has the most technologically advanced military in the world. From unmanned aerial vehicles to social networking systems, the United States uses this technology to give its military an immense advantage over its enemies. As the world seems to turn away from conventional warfare to unconventional warfare, we can examine how technology is used in asymmetrical operations and how it can contribute to the success or failure of a mission. Precision-guided munitions are only one piece of technology used by the United States military. However, by tracking the history of their use in major conflicts beginning with Gulf War I until today, we can see that doctrine is created to fit the current technology and technology is conversely adapted to fit the doctrine.

Beyond Language and Geography: Why Ethnicity Continues to Threaten Kenya’s Stability as a Nation

Elishibah W. Msengeti '09, International Relations-History and Africana Studies
ADVISOR: *Pashington Obeng, Africana Studies*

Following the declaration of Mwai Kibaki as the winner of the 2007 presidential elections, ethnic violence erupted in Kenya killing over 1000 people and displacing tens of thousands from their homes. Through an analysis of Kenya’s political history, social relations, and recorded public speeches, I investigate how longstanding undercurrents were fired up by politicians in the months leading to the election. The fact that majority of the rioters were young unemployed men points to the intricate interrelation of politics and economics in Kenya. Above all, the real and perceived links between ethnic identity and access to resources make it a continuous challenge to achieve democracy and national harmony.

Identity through *Dainos*: The Use of Folk Music in the Creation of Lithuanian Ethnic Identity

Emily D. Saras '10, Anthropology and Music
ADVISOR: *Philip Kohl, Anthropology*

Lithuanians and non-Lithuanians alike have used *dainos* [ancient folk songs] to construct the idea of what it means to be ethnically Lithuanian. These songs are historically tied to pagan folk history and the development of the Lithuanian language. Under both the Soviet Empire and the USSR, Lithuania’s arts were suppressed—and performances were manipulated in order to further the aims of state-sponsored evolutionism. The performance of folk songs in times of occupation allowed Lithuanians to preserve their pride in their ethnicity, despite oppression. After their two separate declarations of independence in the last century, Lithuanians have used performances of *dainos* in festivals to proudly display their cultural roots. This ethnomusicological project is a comparative analysis of the cultural and musical trends in Lithuania over the last century, and demonstrates the critical role of folk song in the creation of Lithuanian identity.

Science and Technology

Code Green: Connecting People to Plants (panel) Science Center 104

Joy Ding '09, Environmental Studies, Christine Kang '10, Psychology, Johanna C. Lake '09, Environmental Studies, and Laura Stevens '11, Geosciences
ADVISOR: *Kristina Jones, Biological Sciences and Environmental Studies*

What’s the name of that tree? Where does that fruit come from? Can plants really grow on a wall? These were just a few of the questions four students explored during a new independent study in the Botanic Gardens. Despite being numerous, tasty and fantastic, plants are often ignored. Taking up the challenge of connecting people to plants, last semester, we chose to dig deeper into the many

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resources of the Botanic Gardens. Guided by lively critiques from her peers and professor, each student completed a project of her choosing. The finished products came in many different forms, including a Robert Frost walking tour, an exhibit on Paramecium Pond, a vertical plant wall, and an edible fruits program featured in the Greenhouse Light Show. All projects crossed the academic-public divide, showcasing plants and plant information with colorful, interactive displays.

Characterizing Buforin II and bCNG Ion Channels: Investigation of Proteins Associated with the Cell Membrane (panel) Pendleton East 339

Ryann C. Guayasamin '10, Biological Chemistry, Jessica F. Hawkins '10, Biological Chemistry, Anna T. Lee '09, Biological Chemistry, Natalya P. Maharaj '09, Biological Chemistry, Hoi See Tsao '09, Neuroscience, and Yang Xie '10, Biological Chemistry
ADVISOR: *Donald E. Elmore, Chemistry*

Antimicrobial peptides and ion channels are both important classes of proteins that mediate processes at the cell membrane. The histone-derived antimicrobial peptide (HDAP) Buforin II (BF2) is hypothesized to cause cell death through membrane translocation and nucleic acid interactions. To better understand the role of BF2's proline hinge location on its bactericidal ability, four proline-relocated mutants were examined. The importance of HDAPs was also studied by characterizing the bactericidal mechanism of action of three novel HDAPs. A newly discovered family of bacterial cyclic nucleotide gated (bCNG) ion channels can give insight into how ion channels respond to small molecule ligands. To this end, the structural and functional similarities between bCNG channels and other families of bacterial ion channels were investigated through molecular modeling, cysteine mutagenesis and osmotic downshock assays. (Research supported by Research Corporation, the Office of the Dean of the College, and the Brachman Hoffman Fund.)

Bigger Is Not Always Better: Investigations in Nanoscience (panel) Pendleton East 139

Linda Guiney '09, Chemistry and French, and Alex Bear '09, Chemistry
ADVISOR: *Nolan Flynn, Chemistry*

Nanoscale science has potential for use in numerous fields such as biomaterials. Proposed biomedical applications include the creation of nanoscale thin films for the mitigation of biofouling and the development of novel nanoscale materials for drug delivery. We will present results from studies of two nanoscale biomaterial systems. The first focuses on using thin films of gold nanoparticles that have their surfaces functionalized with organic molecules. These films have been proposed as coating for medical devices and as substrates for sensing of biological molecules. Despite these interests, little is known about the stability of such films, a property we have been investigating. The second system involves pH-responsive nanoscale metal oxide particles. These hollow materials are based on molybdate (MoO_4^{2-}) and may have good stability in acid environments but dissolve rapidly in neutral or basic solutions. Steps toward creating and characterizing these potential drug delivery vehicles will be highlighted. (Research supported by the Brachman Hoffman Fund and Wellesley College.)

Stem Cell Outreach Initiative: Teaching Junior High School Students about the Promise of Stem Cells (panel) Pendleton West 212

Rachel Casiano '12, Alison Lee '12, Suzy Shepard '09, Political Science and Latin American Studies, Nicolle Strand '10, Bioethics, and Lucy Xu '12
ADVISORS: *Kim O'Donnell, Biological Sciences, and Janet McDonough, Biological Sciences*

During the fall 2008 semester, five students from BISC 105, *Stem Cells: A New Frontier in Biomedicine*, chose an outreach project option as part of their course credit. The program aimed at giving inner-city

Roxbury students a comprehensive introduction to the science and promise of regenerative medicine, with a focus on induced pluripotent stem cells (iPS cells). The students put together an interactive teaching presentation, incorporating hands-on activities tailored to their audience of seventh graders from the Mission Grammar School. Activities included "regenerating" salamander limbs using K'Nex, creating differentiated cells with play dough, understanding the transformation of iPS cells through role-play and acquainting students with stem cell vocabulary using an acoustic competition. Throughout the process of teaching, the outreach experience taught the Wellesley students valuable lessons about education and provided an excellent supplement to course material.

The Growing, Learning Brain (short talks) Pendleton West 116

Modeling Adult Neurogenesis

Colleen Kirkhart '09, Neuroscience
ADVISOR: *Barbara Beltz, Neuroscience*

Like humans and many other species, crayfish produce new neurons throughout their entire lives. The goal of this research is to build a computational model of the crustacean neurogenic system using MATLAB. This model is not only a descriptive summary that helps to unite and consolidate previous findings, but it also functions as a predictive tool, allowing for a better understanding of how possible modifications and treatments influence neural proliferation at the systems level. The existence of a simulation built solely on quantitative analyses also allows us to test the accuracy of our current understanding of this system and may lead us to pose new experimental questions that have not been previously considered.

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Sexual Dimorphism in Brain Serotonin Levels in Crustaceans

Zehra Omer '10, *Neuroscience and Middle Eastern Studies*

ADVISOR: Barbara Beltz, *Neuroscience*

The neurohormone serotonin (5-hydroxy-tryptamine) has both behavioral and developmental effects in crustaceans, including regulation of the molt cycle and the rate of neurogenesis. Preliminary experiments in crayfish suggested that brain serotonin levels may differ in a systematic way between males and females. This project aims to compare brain serotonin levels in American lobsters, *Homarus americanus*, where we use the brains of sibling male and female adults to quantify serotonin levels using HPLC (high performance liquid chromatography) methods. We examine whether the differences in serotonin levels are correlated with the gender or size of the animal, as measured by carapace length. This work also raises the question of how any differences in serotonin levels may be related to the development and overall functioning of the organism.

Do I Know You?: Determining How the Brain Processes

Xiaoyue Guo '11, *Neuroscience*

ADVISOR: Bevil Conway, *Neuroscience*

We can immediately pick out one face among a sea of faces, but this seemingly effortless ability involves complex mechanisms of object recognition. One accepted theory of facial representation describes a “face-space” where faces are points in a Cartesian space; multiple dimensions represent the varying ways to distinguish faces (e.g. by gender, age). Inverted faces, being especially difficult to recognize, are proposed to not be represented in this perceptual space. This summer, I used a contrast-based adaptation paradigm to measure human subjects’ abilities to discriminate images of inverted or upright faces (test) after adapting to a face in either orientation (adaptor). By varying the contrast, and thus difficulty, of test faces, I could see which adaptors facilitated or harmed test-face recognition. Surprisingly,

upright adaptors affected the recognition of inverted tests, but not vice-versa. This asymmetry in adaptation transfer suggests that separate neuronal populations code each orientation, but have some one-way interaction. (Research supported by a CIHR Summer Studentship.)

What Do Babies Know?

Camille Doykan '10, *Neuroscience*

ADVISORS: Nancy Genero, *Psychology*, and Hyowon Gweon, *MIT*

Babies can draw rich inferences even after a brief experience with a single object. For example, upon learning that a toy has a squeaking property, infants can infer that a similar looking toy also squeaks. They accurately generalize that object property even if only small amounts of data are available. But what makes their inferences so accurate? Studies have shown that infants as young as eight months can tell the difference between random and non-random samples of a population of toys, showing a powerful capacity for inductive learning. The present study explores how infants’ sensitivity to statistical properties of a sample may constrain inductive inferences, thereby increasing the accuracy of their generalizations. The results show that infants between 13 and 18 months learn what they see, and they generalize what they learn. However, when given information that is inconsistent with their intuitive statistical inferences, they resist generalizing that knowledge.

Social Analysis

White Girls in Love with Hip-hop: Exploring the Racial Implications of White Female Rappers (interactive teaching presentation) Collins Cinema

Johannah Murphy '09, *Peace and Justice Studies*

ADVISOR: Genevieve Hyacinthe, *Art*

As a white activist, I have identified an existing tension in the realm of working for racial equality. As a woman who grew up with a tremendous amount of privilege I have worked to find my role in a struggle that centers on empowerment. I have witnessed the empowering effect of the hip-hop movement and have studied both the roots of this movement and the role white women rappers have played. While observing the power of this movement, I also recognize the conflicts in my relationship with this movement and the conflicts of all white women who choose to participate and perform within hip-hop. In this presentation I will be looking at these issues through audience involvement in how all of us relate to hip-hop, music, and other cultures, and how our own race and backgrounds play into our developments of our passions and the passions of others.

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Cross-cultural Research

Women’s Studies Panel (panel) Science Center 277

Feminist Confessions: Contemporary Construction of Catholic Authority, Identity, and Sexual Ethics

Shannon Hill '09, *Women’s Studies and Religion*

ADVISOR: Nancy L. Marshall, *Women’s Studies/Wellesley Centers for Women*

There are approximately 40 million Catholic women in the United States and, despite the Catholic Church’s ban on artificial contraception, 97 percent of these women will use some form of contracep-

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tion during their lifetime. How and why are these women choosing to ignore a central component of the Church's teachings? Do they still believe and follow the Church's teachings on other issues, such as women's ordination, celibacy of priests, gay marriage, and abortion? If so, what makes contraception different? For my thesis and this presentation, I gathered research from personal interviews with Catholic women of various ages and backgrounds and from a wide range of sources to better understand how Catholic women make decisions about the use of contraception and how they perceive the Church's authority on sexual ethics.

The Racial and Gendered Politics of Asian American Representation in Competitive Reality Television

Jessica Nahri Cho '09, Women's Studies and Political Science

ADVISOR: *Elena Creef, Women's Studies*

The imaging of Asian Americans has been transformed and recycled throughout American television and film history. The archaic representations of the female dragon lady, lotus blossom, butterfly, or the forever impotent and effeminate Asian man continue to resurface in response to new forms of "yellow peril," "yellow face," and model minority stereotypes. Although current research and literature delve into the way in which Asian American representations are constructed in prime-time television and the media, research in regard to the latest televised phenomenon—reality television—is sparse. Reality television is a medium not only through which representation is constructed, but also one in which authenticity is negotiated. By functioning under the pretense of "reality," these shows blur the line between truth and fiction. As a result, reality television character portrayals, including Asian American depictions, become complex, misleading, and paradoxical. (Research supported by Office of the Dean of the College.)

"I Wear My Balls on My Chest": Gender Subversion in Heavy Metal

Megan Turner '09, Women's Studies and Russian Language and Literature

ADVISOR: *Irene Mata, Women's Studies*

Critics of heavy metal music have described its images of violence and transgression as enacting a misogynistic hypermasculinity predicated upon the objectification and violation of women. Traditional scholarly analyses presuppose that women listening to heavy metal music will identify with the sexualized images of women encoded in the lyrics and that they will passively internalize and perform this construction of femininity. I, however, contend that by choosing to identify with the active, transgressive figure embodied in the implicitly-masculine narrators of heavy metal songs, women can construct a subcultural identity that subverts mainstream constructions of femininity. (Research supported by Office of the Dean of the College and a Schiff Fellowship.)

Alienation and Assimilation (short talks) Pendleton East 339

Russian, Israeli, American, Jew?: Identity Creation among Second Generation Immigrant Jews

Kyla J. Raetz '09, Sociology

ADVISOR: *Peggy Levitt, Sociology*

America was founded by immigrants, and now a whole new wave of their children is coming of age. Many scholars have studied first generation immigrants, but what about their children? This is an important population to examine, particularly right now. This modern second generation accounts for one out of every six 18–32 year olds in the United States. This issue is particularly salient to the American Jewish community; nearly every Jew in the United States is descended from an immigrant to our shores and most are only separated from the old country by three or four generations. Jewish immigration continues to take place today and its effects on the American Jewish community are significant. Within the past few

decades, thousands of Jews have poured in to America from Israel and the former Soviet Union. How do these second generation immigrants create Jewish lives in America?

Statelessness and Strangers: A Comparative Life History Analysis of Young Refugees from South Africa and the United States

Julia Schroeder '09, Sociology

ADVISOR: *Thomas Cushman, Sociology*

Globalization has had many effects, including the production of 16 million refugees this year. My research reconceptualizes this group's social position as strangers. This project is a comparative study of refugee youth in developing and developed societies, based on fieldwork in Johannesburg, South Africa and Boston, Massachusetts as examples of these types, respectively. I explore how young refugees in these two types of societies navigate their way through their lives, including the way in which they perceive their identity as strangers and the social forces they feel shaping that identity. (Research supported by the Office of the Dean of the College.)

Who Are the Zainichi Koreans? Are They Japanese or Korean?

Grace Jaesook Lee '09, East Asian Studies and Political Science

ADVISOR: *T. James Kodera, Religion*

During the earlier years of the Japanese occupation of Korea, most Koreans lived in poverty and many decided to move to Japan where they could find employment. Entering Japan was not difficult since Koreans were considered citizens of Japan; however, the most difficult part was living in Japan. Koreans were treated as second-class citizens and faced harsh discrimination within Japanese society. Towards the end of Japanese colonial rule, many Koreans in Japan repatriated to their homeland. However, approximately 600,000 Koreans decided to remain in Japan. These Koreans and their descendants came to be known as "Zainichi" Koreans. Once Korea was an independent

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nation, first generation Zainichi Koreans lost Japanese citizenship and were given Korean citizenship. However, once the Japanese government allowed Zainichi Koreans to become naturalized citizens, many decided to naturalize. Today, many third and fourth generation Zainichi Koreans struggle between their ethnic Korean and modern Japanese identity. Does naturalization lead Zainichi Koreans to lose their Korean identity?

The Theme of Exile in Maghrebi Thought from 1948 to the Present

Alma Rachel Heckman '09, French and Middle Eastern Studies

ADVISOR: *Anjali Prabhu, French*

To be an exile is to be uprooted from one's homeland. Before French colonization and until the founding of the modern state of Israel (1948), Jewish communities thrived alongside Arab ones in the Maghreb although their rapport was not always perfectly harmonious. However, most Jews fled North Africa to become exiles due to an increasingly hostile environment, which was accompanied by policies of religious exclusivity in new nation states. At the same time, Arabs, too, experienced exile both from within and geographically outside the extreme political climate of fundamentalism that characterized some of these states. In my thesis work this year, I have been exploring, through comparative study, Jewish and Arab views of exile in North African Francophone literature. I will share my findings on the complex experience of exile through Jewish and Arab voices of the region and reflect upon an enlarged understanding of this emotive concept.

China and the Outside World (short talks) Science Center 396

One China: The Effect of the Qing Legacy of Conquest on Modern China

Cynthia Chen '10, Political Science

ADVISOR: *C. Pat Giersch, History*

In recent years, one of the Chinese Communist Party's foremost concerns has been the enforcement of its sovereignty

over Xinjiang and Tibet. As the unrest in Lhasa last March showed, many Tibetans do not fully identify with the Chinese nation. What is the source of these conflicting ideas about inclusion and exclusion from modern China? This project suggests that it could be found in the Qing dynasty's approach to empire, which changed drastically in the frontier during the late nineteenth and early twentieth centuries. During the time, Qing authorities began incorporating the ethnically differentiated populations of Xinjiang, Tibet, and Inner Mongolia by applying the policies used in China's provinces. This was a dramatic shift from the way these areas were previously governed. What factors and changing ideas about governance within the Chinese state led to these adjustments? (Research supported by the Office of the Dean of the College.)

Kinship, Social Capital, and Trust: American Merchants in China, 1803–1844

Sarah Corrigan '09, Economics and History
ADVISOR: *C. Pat Giersch, History*

In an allegedly global age, one crucial question for international economic development is what makes cross-cultural business relationships possible? How do people build trusting relationships, even if they come from different backgrounds? This study seeks to answer these questions by combining social, cultural, and business history. Personal and business communications are used to understand how kinship organization in both American partnerships and Chinese trading networks facilitated the creation of social capital and trust between different merchants. Although early Sino-American interaction faced remarkable cultural obstacles, trade between American and Chinese merchants in Canton, China was extremely lucrative. I analyze one of the most successful collaborations developed between Boston-based Russell & Co. and Yi-Ho, the firm of the legendary Houqua II. (Research supported by the Henry Schwarz Honors Fellowship.)

Economic Issues

Creating the Brand (exhibition) Pendleton West 117

Indi Marisa V. Frank '09, Media Arts and Sciences and Psychology

ADVISOR: *David T. Olsen, Art*

In our current economic climate how do we shift through our luxuries, curtailing some expenditure while embracing others? The products and services which we continue to buy are those whose images we buy into. The products that we deem essential, beyond clothing, food and shelter, are those that seemingly strike at the core of our identities, embodying our values and aspirations. How do you create this image, this "lifestyle brand?" Over the last semester I invented a product and created a stylized advertising campaign which combining consumer research, interaction, and product's perception aims at creating a unified brand image and delves into the question of "how to make a brand?" "How do you create cool?"

Flying High, Flying Low (short talks) Pendleton East 239

Unfriendly Skies: The Effect of Low-cost Carriers on Domestic Airline Competition

Xing-Yin Ni '09, Economics

ADVISOR: *Akila Weerapana, Economics*

The Airline Deregulation Act of 1978 changed the face of the United States airline industry, altering its competitive structure and eliciting several antitrust concerns. One key change to air travel has been the increased prevalence of low-cost carriers (LCCs) as a discount choice for passengers. In recent years, several LCCs have exited the market through bankruptcy or liquidation, citing rising fuel costs as a primary cause. Did established carriers significantly increase their airfare when competing LCCs left city-pair routes? Should there be a shift in policy to encourage a larger LCC presence in the industry?

11am–12:10pm

Easing the Transition to Adulthood: The Effects of Increasing the Age of Dependency for Health Insurance to 25

Samantha Heep '09, Economics
ADVISOR: *Phil Levine, Economics*

Young adults represent the largest group of Americans who are not covered by health insurance. One third of young adults (13 million) lack health insurance, compared to 16 percent of the population as a whole. Limited access to coverage and rising costs are primary barriers facing young adults first entering the labor force from obtaining insurance. Since the early 1990s, 20 states have implemented extended dependent coverage laws, allowing unmarried young adults to be covered under a parent's private health insurance plan until their 25th birthday. This research examines whether these laws work as designed to increase health insurance rates among young adults. We take advantage of the cross-state variation in the timing in which these laws were introduced and examine the success of the laws by investigating their effect on health insurance rates within the target demographic group.

The Effect of Falling House Prices on Labor Mobility

Lindsay Relihan '09, Economics
ADVISORS: *Karl E. Case, Economics, and Akila Weerapana, Economics*

The efficiency of the American economic system relies on the mobility of capital and labor across regions. However, labor mobility is largely dependent on the performance of the housing market; before a worker can migrate, he or she must sell a home and buy a new home. Falling house prices slow this process and, therefore, the speed with which workers obtain new employment. Using state-to-state migration data, I attempt to quantify this effect. I expect to find that states with falling house prices experience higher unemployment as a result of restricted migration. The recent collapse of the housing market and subsequent recession will be slower to recover if this relationship holds.

Migration and the Gender Wage Gap: Mexico Post-NAFTA

Ro Chin '09, Economics and Spanish
ADVISOR: *Kristin Butcher, Economics*

There is much debate about how trade liberalization, a force behind globalization, affects women. One of the most important trade liberalization agreements in the decade of the nineties was the North American Free Trade Agreement (NAFTA), implemented in 1994 among the United States, Mexico, and Canada. NAFTA was expected to have a particularly significant effect on Mexico because it was gaining market access to two large, prosperous economies in the United States and Canada. Though wages and GDP increased in Mexico post-NAFTA, certain regions and industries may have benefited more than others. Similarly, certain groups in the population may have benefited more than others from these changes. NAFTA may have had differential effects on male/female wages and migration. I investigate how the gender wage gap changed during this time period and whether those changes are related to NAFTA. For example, did NAFTA change male/female mobility patterns in Mexico? Did NAFTA generate changes in job opportunities that differentially affected men and women?

the times of Brezhnev and Kosygin. This presentation will include discussion and performance of Shostakovich's Seventh and Eighth String Quartets (1960), which demonstrate the political and autobiographical impulses found in many of his compositions. The Seventh Quartet represents a personal turning point for Shostakovich—a farewell in music to his first wife, Nina, with whom he shared a turbulent yet loving relationship. The Eighth Quartet, while just as personal as the Seventh, was also Shostakovich's tribute to Soviet WWII victims. By presenting two contrasting pieces, we will examine the emotional and political circumstances that fostered Shostakovich's two quartets, and also analyze the impact of such knowledge on successive interpretations made by scholars and performers.

Anatomy of a Book (interactive teaching presentation) Clapp Library, Book Arts

Yetunde Abass '09, English and Creative Writing, and Susanne Everill '09, Classical Civilization and Medieval/Renaissance Studies
ADVISORS: *Ruth R. Rogers, Special Collections, and Katherine McCanless Ruffin, Book Arts Program*

We all know books are made of paper, ink, glue and thread, but most of the time we don't get a chance to see these elements and how they come together to form the finished product. In this presentation, visitors to the Book Arts Lab will see the processes and raw materials that form a book—paper and how it is made, loose type, printed pages, and various types of bindings. The steps of the creation of a book will be illustrated with materials made by students in ARTS 107, and visitors will also be able to see finished examples of different types of books including historical books and artists' books from Special Collections as well as current student work. Participants may also print a letterpress keepsake to take home.

Literature and the Arts

Shostakovich: A Life Reflected through Music (long performance) Jewett Art Center, Auditorium

Julia Blood '09, Neuroscience and Japanese Languages and Literature, Nina Hart '09, Political Science and Music, Katherine Musgrove '09, Economics and Spanish, and Kira Treibergs '09, Biological Sciences
ADVISOR: *Jan Pfeiffer, Music*

How does music reflect the personal experiences and circumstances of the composer? To explore this question, our quartet will focus on Dmitri Shostakovich, a composer whose life spanned from before the Russian Revolution through

11am–12:10pm

White Noise (exhibition) Pendleton West 220

Tamara Al-Mashouk '10, Architecture

ADVISORS: *Daniela Rivera, Art, and Phyllis McGibbon, Art*

White Noise stems from an interest in the architectural study of space. Space is defined by subtleties that are often unnoticed. This project is the first of many that will magnify and focus on these subtleties. White Noise studies tight spaces with relation to claustrophobia. The aim is to create a space that is restricting, in which one sits in solitude, tightly cocooned. As an experimental variable, soft and white materials such as yarn, paper pulp, fiber filling and plaster are used—adding an element of comfort and forcing us into a contradiction between comfortable tight spaces and the inevitable fact that we are confined.

Memories Retold (exhibition) Jewett Art Center, Student Gallery

Courtney Richter '09, Studio Art and Art History

ADVISOR: *Phyllis McGibbon, Art, and Daniela Rivera, Art*

I began my thesis year thinking about objects and images that evoke strong sensory and emotional experiences from my childhood. A typewriter, a tufted living room chair, a canoe, a trumpet and a multitude of other seemingly unconnected objects form my “image lexicon.” Experimenting with different image combinations, I attempted to reinvent pieces of my childhood. The effort to grasp these memories, however, is in vain, for my recollections are tainted by the passage of time, dominated by a particular feeling, or revised by subsequent experiences. Using collage processes in print, drawing, and other media, I am able to add, delete, shift, and revise imagery, mimicking the fragmented nature of memories. (Research supported by the Office of the Dean of the College and the Art Department.)

Ran Tao '09, Media Arts and Sciences and Philosophy

ADVISOR: *Judith Black, Art, and David T. Olsen, Art*

My thesis seeks to use the tools of the computer to create a multisensory and trans-cultural understanding of a well-known Chinese story of my childhood, *Journey to the West*. My goal is to have others perceive the experiences of the story as something familiar and natural, as memories that they would have had as children, rather than ones of a distinctively different culture. While digital media—such as film and television—can create potent childhood memories, there is still a need to invest in some sort of physical manifestation of those experiences. All of these memorabilia, along with attaining sentimental value, ultimately serve as tangible validations of memory. Making use of the computer’s ability to create and proliferate forms, my artistic process aims to make work that is approachable and conducive to interaction, echoing the playfulness of childhood. (Research supported by the Office of the Dean of the College and the Art Department.)

Evoking Images (short talks) Pendleton West 116

The New York City Waterfalls: **Olafur Eliasson**

Adrienne Jacobson '09, Art History

ADVISOR: *Patricia Berman, Art*

The New York City Waterfalls (2008), four temporary site-specific sculptures by Danish-Icelandic Olafur Eliasson, were in many ways the most ambitious works of public sculpture (\$15.5 million) in New York’s history. Eliasson is known for his spectacular installations and environments, made to simulate natural phenomena. His artistic goal is to change the viewer’s perception of what is considered “natural.” To accomplish this, his works often undermine our sensorial apparatus. His *Waterfalls* (installed in the East River) offered a hybrid phenomenon: neither fully “natural” nor industrial, they offered New York a new sublime. Some

critics proclaimed it a disappointment, but Eliasson’s project offered something provocative and reassuring for New Yorkers.

Designing the Eighteenth-century Interior: Issues of Function, Style, and Authorship in the Davis Museum’s Album of 138 Rococo and Neoclassical Ornament Prints

Ashley Boulden '09, Art History

ADVISOR: *Meredith Martin, Art*

Recently acquired by the Davis Museum, this album of French ornament prints comprises several notebooks that were bound together in a single volume in the second half of the eighteenth century. My analysis of the volume’s design and production illuminates our understanding of the dissemination and accessibility of visual information at the end of the Ancien Régime. By gathering information from comparable albums at several museums, I demonstrate how the prints functioned commercially, as commodities, and socially, as representations of objects that were used to secure and display social status. Ultimately, I aim to establish how such prints circulated in the pre-Revolutionary art market, evaluate the impact of recent archaeological discoveries at Pompeii and Herculaneum on the transition from the Rococo to the Neoclassical, and analyze the role that decoration assumed in Enlightenment interiors as a means of shaping social identity. (Research Supported by the Jerome A. Schiff Fund.)

“...will they document our tears, but not our smiles?” Photographic and Literary Portrayals of Mexican-American Farm Workers in California, 1927-1950

Jo Ann Gerber '09, Spanish

ADVISORS: *Jill Syverson-Stork, Spanish, and Joy Renjilian-Burgy, Spanish*

Lydia Vasquez Carlsen and her family worked as migrant farm workers in California during the '20s, '30s, and '40s, often in the same locations captured by documentary photographer, Dorothea Lange. Her experiences have been recorded in an unpublished memoir



11am–12:10pm

written by Lydia with her husband, Robert D. Carlsen, and edited by this presenter. By documenting her life as a migrant farm worker, and by tinting and highlighting each memory with the spirit that allowed her to persevere despite the adverse conditions her family faced, Lydia gives scholars and the public at large an important, fuller, and more nuanced picture of the migrant farm-working experience than is evident in the extant portrayals, including those found in documentary photography, fiction, and memoir. Using photographs from the Library of Congress, and from the Vasquez family collection, this presentation will share the presenter's efforts to understand and to help document Lydia's story. (Research supported by the Office of the Dean of the College and the Student Research and Conference Travel Grant.)

Understanding God and Man through Creation

Hannah Kapnik '10, Art History and Jewish Studies

ADVISOR: *Laurence Rosenwald, English*

Within one text, God is infinite, loving, jealous, all-knowing, omnipotent, angry, curious, regretful, creative, and destructive. This talk will begin to explore the ways in which the first chapter of Genesis illuminates and constructs an understanding of God. Traditional and modern Jewish commentators grapple with and glean from the apparent inconsistencies in the Bible. This project seeks to engage traditional forms of bridging and valuing variations within the text. The talk will address the importance of biblical and exegetical texts in developing a rich and complex concept of the nature of God and the human relationship with Him.

Science and Technology

Clean, Green, Athletics Machine: Sustainable Renovation of the Wellesley College Sports Center (panel) Science Center 278

Tyler S. Blangiardo '09, Environmental Studies, Priya Gandhir '09, Environmental Studies, Marg D. Garascia '09, Environmental Studies, Haley M. Geller '10, Environmental Studies, Susan W. Hall '09, Environmental Studies, Taylor Y. Harvey '10, Environmental Studies, Emily B. Hewitt '09, Environmental Studies, Johanna C. Lake '09, Environmental Studies, Catlin I. Powers '09, Environmental Studies and Chemistry, Relena R. Ribbons '09, Environmental Studies, Erin E. Ryan '09, Environmental Studies, Alex R. Warren '10, Environmental Studies and Religion, Priscilla D. Watson '09, Environmental Studies and Philosophy, Kate E. Wyman '09, Biological Sciences, and Song-Song Xi '10, Environmental Studies

ADVISOR: *Beth DeSombre, Environmental Studies*

The same historic landscape and architecture that make Wellesley College so picturesque can act as barriers to campus sustainability. With major renovations to the Keohane Sports Center set for the near future, the college has an opportunity to create a truly environmentally conscious space on campus. Such a space could simultaneously reflect the needs of current and future Wellesley students and take into account the greater global impact of our local actions. At the request of the Facilities Department, the ES 300: *Environmental Decisionmaking* class has drafted suggestions for Sports Center renovations that minimize the building's environmental footprint as they maximize its utility. Come hear the results of our semester-long report, share your thoughts, and get an idea of what "green" architecture could mean for Wellesley College. Let 2009 be the year we "go green, or go home."

Curing Cancer and Hepatitis C: One Beaker at a Time

(panel) Pendleton West 212

Nayna Lodhia '09, Chemistry, Joyce Ngai '09, Chemistry, Claire Reddy '09, Chemistry, Adina Badea '11, Chemistry, and Alice Kwan '11

ADVISOR: *Dora Carrico-Moniz, Chemistry*

Have you ever wondered how drugs are developed? How do scientists battle deadly diseases such as cancer and hepatitis C on a molecular level? If questions like these intrigue you, then this session will provide some insight into the process by which chemists develop novel therapeutic compounds. We present our work on developing several potential anticancer agents and HCV inhibitors. Work towards the design, synthesis and evaluation of two natural products and their structural analogues as promising anticancer agents, along with our progress towards the synthesis of a novel series of HCV NS3/4A protease inhibitors will be presented.

A Provably Better World: Improving Health and Advancing Chemistry Using Computational Optimization (panel) Science Center 104

Andrea Johnston '09, Chemistry, Mona Minkara '09, Chemistry and Middle Eastern Studies, Maggie Chidothe '10, Chemistry and Economics, Victoria Abrenica '11, Kathy Chen '11, and Naomi Sedani '11, Biological Chemistry

ADVISOR: *Mala Radhakrishnan, Chemistry*

Computational optimization is a new and exciting tool to advance treatments for HIV. In the Radhakrishnan Lab, students use various methods of computational optimization, incorporating physical principles and clinical data in order to attack the problem of HIV treatment from many angles. Students from this laboratory will present current progress on projects relating to the application of optimization in numerical methods development, drug cocktail design, electrostatic binding analysis, and clinical data classification.

11am–12:10pm

Social Analysis**On Disabling Speech: A Response to Bird** (panel) Collins Cinema

Alexandra Adelman '10, Classical Civilizations and Cognitive and Linguistic Science, Sara Helmers '10, History, Jackie Stolzenberg '10, Political Science and Philosophy, and Kelsey Turbeville '09, Classical Civilizations

ADVISOR: *Mary Kate McGowan, Philosophy*

Many contend that (further) regulating pornography would be an unconstitutional infringement of the free speech right. Catharine MacKinnon argues instead that failing to (further) regulate pornography violates women's right to free speech. According to MacKinnon, pornography silences women by systematically interfering with women's ability to successfully perform certain speech acts. If this is right, then the free speech rights of pornographers directly conflicts with the free speech rights of women. Using the philosophy of language, Rae Langton and Jennifer Hornsby offer a speech act account of silencing. Alexander Bird criticizes their account. We defend the Langton-Hornsby account of silencing by refuting Bird's arguments.

Wellesley and Wo(men) Together (short talks) Pendleton East 139**Collegeplaces: Why Students Feel at Home (or Don't) on College Campuses**

Celene Reynolds '09, Sociology

ADVISOR: *Lee Cuba, Sociology*

When new students arrive at college, they confront the campus landscape, not just its physical geography but also its less concrete yet still palpable atmosphere. Whether the student experiences a sense of belonging, a sense of rootedness, or a sense of displacement on campus, she unavoidably interacts with this geography to construct or develop a relationship with and attitude towards it. Drawing on semi-structured interviews with students at three of seven schools participating

in a panel study of the class of 2010, my presentation will focus on the various ways that students come to feel "at home" and develop place identities rooted in the college environment. I will also examine the influence of students' personal environmental histories (i.e., those landscapes—birthplaces and other residences, primary and secondary schools—with which the student has already established a relationship) on their responses and attachments to the college landscape.

Male Cross-registrants at a Women's College: Effects on the Academic Achievement of Wellesley College Students

Yo-Jud Cheng '09, Economics

ADVISOR: *Patrick McEwan, Economics*

The number of male cross-registrants at Wellesley has reached unprecedented levels over the past few years. During the fall 2007 semester, 11 percent of classes had at least one male student. The mission of Wellesley College is to "provide an excellent liberal arts education for women," but how important is the "for women" aspect of a Wellesley education? Research suggests that the presence of male students in a classroom environment can significantly affect the interactions between students and faculty, and may even unconsciously influence the behavior of students through stereotype threat. I use an econometric framework to analyze whether or not the enrollment of a male student in a class affects the academic achievement of Wellesley students. (Research supported a Schiff Fellowship and the Office of the Dean of the College.)

Urban Convents in Eighteenth Century Italy: The Case of Santa Maria Egiziaca in Bologna, 1689-1760s

Liise Lehtsalu '09, History and Italian Studies

ADVISOR: *Valerie Ramseyer, History*

As a small urban convent designed to house repenting prostitutes, Santa Maria Egiziaca provides an interesting case study of the dilemmas faced by many early

modern convents. On the one hand, both ecclesiastical and secular authorities perceived female monastic institutions as subject to enclosure that separated them from the surrounding secular world. On the other hand, the demands of long-term financial survival and institutional continuity required convents to engage with near-by communities and encourage outside interest in convent affairs. Balancing this conflict of interests became a struggle that resulted in continuous compromise of stated principles and open challenges to the convent identity. (Research supported by the Henry Schwarz Honors Fellowship.)

Ambition in Wellesley College Students

Amelia Iuvino '11, Sociology

ADVISOR: *Lee Cuba, Sociology*

In an academically competitive atmosphere like Wellesley, does ambition contribute to a college culture of "stress," or does our environment furnish our ambition? What are the motivations behind the majors that we choose, the activities in which we participate, and the internships that we complete? Through a qualitative analysis of interviews with the class of 2010 completed by the New England Consortium on Assessment and Student Learning (NECASL), I will explore the combination of formal and substantive rationales that inform our choices as Wellesley students. (Research supported by a Sophomore Early Research grant from the Office of the Dean of the College.)

1:30–2:40pm

Cross-cultural Research**Cross-cultural Health Issues**
(short talks) Science Center 104**Cold Showers and Tuberculosis:
Ethnographic Insights from a
Guatemalan TB/HIV Clinic***Samantha Bellach '10, Neuroscience*
ADVISOR: *Erich Fox Tree, Anthropology*

The tuberculosis and HIV clinic of Guatemala's Hospital Rodolfo Robles exemplifies a holistic approach to patient care that offers lessons for medical care in the USA. My ethnographic study of the clinic while a volunteer there in 2008 suggests that the philosophy of the clinic operates on principles of Zapatista ideology: Though the stay is free, the patient is expected to perform menial tasks such as cleaning dishes, washing laundry and maintaining his or her living space. These activities train the ill to take responsibility not only for their own care, but for the healing environment itself.

My participant-observations in Guatemala address the benefits of Zapatista self-sufficiency, but contextualize such benefits within the framework of a neoliberal state that has historically viewed self-sufficiency as a threat to governmental power. An understanding of such conflict is critical in highlighting the role of NGOs in the anti-politics of healthcare reform. (Research supported by Casa Xelajú Language School and by the patients and staff at Hospital Rodolfo Robles.)

**Shooting Up Together: An Exploration
into the Heroin Subculture in Boston***Kendall LaSane '09, Anthropology*
ADVISOR: *Anastasia Karakasidou, Anthropology*

Heroin addiction is a pervasive cross-regional public health problem in American society that often results in expensive hospitalizations and injury-related deaths. Heroin is a semi-synthetic opioid created from morphine that brings analgesic effects similar to the body's

natural painkillers, but provides euphoria when used recreationally. In Boston, heroin is the primary "hard" recreational drug used; therefore it is necessary to explore addiction's causality and the ways that heroin's properties and highly addictive nature contribute to addiction. Furthermore, I also address how that definition negatively influences treatment and health outcomes for users. Social suffering and marginalization from society enable them to create their own subculture that continually gives them access to social networks, gift/exchange relationships and relative economic stability. My goals are to express the shortcomings of homogenous abstinence-only treatment modules and stress how they do not adequately address the comprehensive health needs of a heterogeneous heroin-using population.

**Indoor Air Pollution Exposures in
Himalayan Communities***Catlin I. Powers '09, Chemistry and
Environmental Studies*
ADVISOR: *Nolan Flynn, Chemistry*

Indoor air pollution (IAP) is responsible for 1.6 million deaths per year, the majority of which occur amongst the three billion global citizens who rely on solid biomass for fuel. Himalayan communities suffer disproportionately from IAP because freezing outdoor temperatures have led to a tradition of poorly ventilated houses. In addition, dung—the primary fuel source—emits more pollution and greenhouse gases per unit of energy extracted than any other fuel. Please join me to learn about my research on IAP exposures in the Himalayan indoor environment and potential abatement strategies. (Research supported by the Pamela Daniels '59 Fellowship, Clinton Global Initiative, and Muhammad Yunus Award.)

Economic Issues**Trading Up**
(short talks) Pendleton East 139**The New Trade Theory:
Extensions to Occupational Wage
Inequality in the U.S.***Andrea Liang '09, Economics
and Mathematics*
ADVISOR: *Malhar Nabar, Economics*

Does international trade significantly affect wage inequality in the United States? Traditional trade theory says that yes, it does; however, many notable economists have written papers which have concluded that trade of the type and scale which the United States is typically engaged in has not been a major factor in the vast increase of wage inequality in the U.S. over the past three decades. These papers have chiefly focused on the effect of trade on the wages of low-skilled workers; little work has been done to determine whether burgeoning *top-tier* inequality has any roots in international trade. This research determines the implications of the New Trade Theory—espoused by Paul Krugman (1979) and Marc Melitz (2003)—on domestic wage inequality, suggesting that trade patterns contribute significantly to widening upper-tail inequality. (Research supported by the Jerome A. Schiff Fund.)

**The Economic Consequences of Freeing
the Grapes***Marisa P. Kaley '09, Economics and
Russian Language and Literature*
ADVISOR: *Ann D. Witte, Economics*

Americans treated themselves to more than 700 million gallons of wine in 2007, fueling a \$30 billion industry. Wine is produced in 48 states, often by small-scale wineries whose owners long to expand their business by selling directly to customers nationwide. Many state governments, however, prohibit the direct shipment of wine from out-of-state producers to consumers in their state. Wine must instead pass through wholesalers, who contend that allowing direct shipping

1:30–2:40pm

would harm not only their business, but also consumers and wineries. Consumers are frustrated by an inability to purchase certain wines locally and accuse wholesalers of using their monopoly on distribution to inflate prices. I will discuss the relevant legal issues and the results of two natural experiments focused on the economic effects of shipping laws in five states, including Massachusetts, that restrict the direct shipment of wine to varying degrees.

The Impact of Financial Modernization on Women-owned Businesses

Lauren Tilden '09, Economics and Spanish
ADVISOR: *Kristin Butcher, Economics*

Access to credit is fundamental to the well-being and growth of small businesses, and historically, small businesses have disproportionately received loans from small banks. Two landmark pieces of legislation in the 1990s, the Riegle-Neal of 1994, and the Gram-Leach-Bliley Act of 1999, resulted in significant consolidation of smaller banks into larger institutions. This may have had a particularly important impact on women-owned businesses, as women-owned businesses tend to be smaller than men-owned businesses. My research examines the impacts of these banking law changes on the relative access to credit for women-owned businesses compared to men-owned businesses. Using the Federal Reserve's Survey of Small Business Finances, I look at loan interest rates, size of loans, and likelihood of loan approval for women-owned businesses, controlling for observable characteristics, before and after each law passed to determine the impact of financial modernization on loan financing for women-owned businesses. I further test for whether, conditional on loan terms, female-owned businesses have better outcomes than male-owned businesses. If so, that would provide evidence that banks are using a different decision rubric to determine whether to make loans to women-owned firms.

Literature and the Arts

Love, Valor, Salvation (long performance) Schneider Theatre, Black Box

Valerie King '09, Theatre Studies and Anthropology, Sarah Moazeni '10, Theatre Studies, Elizabeth Stone '10, Theatre Studies and English, Samantha Cooper '09, Theatre Studies and Classical Civilization, Caitlin O'Connell '10, Theatre Studies, and Ruth Craig '09, Theatre Studies

ADVISOR: *Nora Hussey, Theatre Studies*

Now a Ruhlman tradition, Wellesley College Theatre student directors and actors collaborate to recreate theatrical highlights of the 2008–2009 season. This year the Wellesley Theatre Department and Wellesley College Upstage opened a new space with productions focusing on the age old themes of war, love, family, friends, community, murder, duplicity, reality, belonging, and not belonging. Woven with the music, rhythm, and language from across the country, across the world, and through time past and present, these pieces remind us of our own struggles, hopes, fears, and dreams. From Shaw to Mamet, from Jacobean to modern, from Ireland to Mississippi these pieces awaken our hearts and minds and resonate with the rhythms of our spirit.

Ariettes oubliées: Symbolist Correspondence between Music and Nature (long performance) Jewett Art Center, Auditorium

Elizabeth Merrill '09, Music
ADVISORS: *Gurminder Bhogal, Music, and Marion Dry, Music*

Claude Debussy (1862–1918) was a composer who believed that music had the power to evoke nature without having to directly imitate it. He demonstrates this idea in his song cycle, *Ariettes oubliées* (1885–7), which is based on poems by the Symbolist poet, Paul Verlaine (1844–1896). Debussy uses compositional innovations in

harmony, melody, and texture to highlight natural imagery in his songs. These musical techniques allowed Debussy to convey an experience of nature that was in keeping with ideals of Symbolism, a nineteenth-century literary movement that favored the evocation of objects and emotions through elusive suggestion rather than explicit textual representation. In this presentation, I will undertake text-music analysis to inform my performance of song extracts. My goal in so doing is to show how Debussy's settings of these poems enhance Verlaine's allusion to various emotional states, while intensifying the poet's attention to nature's effect on human emotion.

A Grand Concert of Instrumental Musick: The Art of Performing Baroque Music on Period Instruments (long performance) Pendleton West 220

*Kaylan Stevenson '09, History, and
Natasha Roule '11, Medieval and
Renaissance Studies*
ADVISOR: *Suzanne Stumpf, Music*

Performing on period instruments presents unique opportunities for a deepened understanding of eighteenth-century repertoire as well as challenges specific to each instrument. The construction of instruments such as the viola da gamba, Baroque flute, and harpsichord cause the instruments to resonate differently in various keys, giving them unique characters. Additionally, an understanding of music theory helps build the improvisatory and ornamentation skills that create the distinctively Baroque style. This presentation will feature performances on the flute, viola da gamba, and harpsichord of music by LeClair, Boismortier, and others, in conjunction with a discussion about period instrument performance practice.

1:30–2:40pm

**“Girls at Home, Girls Abroad”:
Readings from Three Creative
Writing Theses** (literary readings)
Science Center 277

“Cats and Coons”, a Short Story

*Susan Muensterman '09, English
and Creative Writing*

ADVISOR: *Marilyn Sides, English*

My creative writing thesis is a combination of short stories and novel chapters, all set in America’s Heartland and navigated by young female narrators. I’ll read an excerpt from one short story, “Cats and Coons.” You’ll meet Rachel, a girl who falls in love with Mel when he invites her over to slaughter. Despite Mel’s tough-boy exterior, he proves himself perhaps smarter than he is initially given credit for. (Project supported by Pamela Daniels ’59 Fellowship.)

The Family Plot: Stories

*Jessica Trimble '09, English and
Creative Writing*

ADVISORS: *Susan Meyer, English, and
Luther Tyler, English*

Part fiction and part family history, the stories in this collection explore the ways in which family folklore is created, retold, and modified over time. By forging alliances, clinging to old feuds, and keeping secrets for and from one another, the family members in each story shape their own—sometimes conflicting—versions of family legend. I will read from the title story, in which three sisters disagree about the proper way to bury their older brother.

**Dance in the Sun: Discovering a
Controversial Tradition**

Eliza Borné '09, English and Spanish

ADVISOR: *Marilyn Sides, English*

The thought of a bullfight, for many, elicits disgust and revulsion—how can the public display of an animal’s death possibly be entertaining? This was my thought until I attended a bullfight in Sevilla, Spain. The image of the matador circling the bull in a graceful *pas de deux* has remained

with me ever since. In “Dance in the Sun,” a creative nonfiction essay about the beautiful and tragic—and above all, controversial—practice of the Spanish bullfight, I hope to inspire questions of the nature of art, sport, and the importance of cultural traditions. (Research supported by the Office of the Dean of the College.)

Political Development

**Political Realities: The Language of
Policy and Movements** (short talks)
Science Center 396

**The Political Implications and Real-life
Application of Italian Immigration Law
on Albanian Migrants**

*Kathleen Livingstone '09, Italian Studies
and Political Science*

ADVISOR: *David Ward, Italian Studies*

Italy has been experiencing exponential growth in its immigrant population since the early 1990s. Though historically a country of emigration, Italy has some of the toughest and most unforgiving immigration laws in the European Union. Racism and discrimination against immigrants are a recognized problem for both the citizenry and the government. Italian immigration law reflects these negative attitudes. It permits immigrants to enter Italy relatively easily, but makes it nearly impossible for these immigrants to renew their visas and maintain their legal statuses. Instead of returning home, most of these irregular migrants become illegal and are forced to work in the grey sector to preserve their livelihoods. To demonstrate this phenomenon, I examine the experiences navigating modern Italian immigration law of arguably the largest group of migrants in Italy—Albanians—through both research and one-on-one, visually-recorded oral histories. (Research supported by the Office of the Dean of the College.)

**The Transnational Antisweatshop
Movement: Realities and Politics of the
Global Labor Market**

*Rakeen Mabud '09, Political Science
and Economics*

ADVISOR: *Rob Paarlberg, Political Science*

Though the transnational anti-sweatshop movement enjoys widespread support, the moral and economic reasoning offered by the movement is frequently questioned by economic literature. This literature suggests that factory work often offers the best option for workers in poorer countries. Though it is indisputable that sweatshops are terrible places to work, the intervention of the transnational anti-sweatshop movement does not address the root cause for why there are so many women seeking out factory work around the world—poverty. This presentation will explore the reconciliation between the economic views that argue for the benefits of factory work versus the views of the anti-sweatshop movement, which highlight the poor working conditions and low wages found in garment factories all over the world. (Research supported by the Office of the Dean of the College and the Barnett Miller Fund.)

**Language and State Terrorism during
the Argentine “Dirty War”**

Paola Reyes '09, History and Psychology

ADVISOR: *Alejandra Osorio, History*

From 1976 to 1983 a military dictatorship disappeared approximately 30,000 people in Argentina. Over 340 concentration camps were built to aid in the torture and murder of alleged “subversives;” newspapers were controlled; anyone who opposed the regime was kidnapped and disappeared. Yet the military maintained active and passive consensus in Argentina and retained significant foreign support. These feats were primarily accomplished through their use of a new language of power. By publicly introducing strategic words and phrases, the military shaped the perceived reality in Argentina, naturalizing human rights abuses in the process. The military’s use of this new language is contrasted to



1:30–2:40pm

the language used by the Mothers of the Plaza de Mayo, the only Argentine human rights organization that, at the time, publicly denounced the ongoing disappearances. During my presentation, I will draw upon research findings and my summer research experience in Buenos Aires, Argentina to illustrate this process. (Research supported by the history department Schwarz Fellowship.)

The Midwife of History: Hannah Arendt, Frantz Fanon, and the Concept of Political Violence

Kristina Costa '09, Political Philosophy
ADVISOR: *Debra Candreva, Political Science*

In 1969, political theorist Hannah Arendt published a long essay titled *On Violence*. It was Arendt's first major foray into the theory of violence in action, particularly political action, and contained not only an exploration of the concept of political violence within the matrix of Arendt's broader political theory but also a scathing repudiation of Frantz Fanon. Fanon, a Martinican psychiatrist-turned-FLN activist, was a major theorist of the Algerian revolution whose *Wretched of the Earth* became a well-known anticolonial manifesto. My talk, based on my senior thesis, will focus on the conflict between these two prominent twentieth-century political thinkers.

Science and Technology

Foundations in Vision (panel) Pendleton West 116

Cleo Stoughton '11, Neuroscience, Mona Guo '11, Neuroscience, Rosa Lafer-Sousa '09 Neuroscience, Pierce MacConaghy '11, Neuroscience, and Martie Philiossaint '10, Neuroscience
ADVISOR: *Bevil Conway, Neuroscience*

Sensory information is processed along parallel tracks within the brain; within each track, information is communicated along a series of hierarchical stages beginning with the sensory receptors and

ultimately integrated by brain centers involved in cognition and behavior. Within the visual system of mammals, evidence suggests that parallel tracks process information about color, form, and motion. Our lab is interested in understanding the neural mechanisms that underlie this process. We explore the mechanisms for vision in human and animal models, including macaque monkeys, squirrels, and rats. Monkeys are used to investigate mechanisms of trichromatic color. Visual experiments investigating object recognition, dichromatic color matching, and spatial navigation are carried out in simpler animals, like rats and squirrels. The lab is also involved in experiments that address the relationship between vision and art. This panel will discuss what we are learning about perceptual phenomenon concerning color, object recognition, and stereopsis. (Research supported by the Amabel Boyce James Fund for Research in the Sciences, the Georgeanne Miller Mulhern Summer Research Fund in the Sciences, the Sherman Fairchild Foundation's Summer Stipend Program in the Sciences, the Whitehall Foundation, and Wellesley College.)

Order and Disorder (short talks) Science Center 278

Chaotic Orbits of Uranian Moons

Rebekah Dawson '09, Astrophysics
ADVISOR: *Richard French, Astronomy*

Though Uranus' inner moons are tiny, the spacing of their distances from Uranus causes them to strongly push and pull on each other in ways that lead to chaos in their orbits. Using telescope observations from the Hubble space telescope and Keck 10-meter ground telescope and numerical models of the moons' interactions, I've investigated how the moons' orbits change over short timescales and assessed the stability of this chaotic system. This system of small satellites is a dynamical laboratory for studying the stability of planetary systems in both our own solar system and extra-solar planetary systems. (Research

supported by the Jerome A. Schiff Fund and the National Science Foundation.)

Who Goes First?: Finding Fair Rankings of the Points in a Partially Ordered Set

Alicia West '11, Mathematics
ADVISOR: *Ann Trenk, Mathematics*

We begin with an introduction to posets, or partially ordered sets, and give several examples, motivating our study by the real-world problem of triage in hospital emergency rooms. We next define the total discrepancy of a poset and find the total discrepancy of the poset A_n (the anti-chain). We then calculate the total discrepancy of the poset S_n , or the "Standard Example" and prove our result is correct. We conclude by placing our result in a larger context. (Research supported by the Office of the Dean of the College: Sophomore Work-study Research Program.)

Thermodynamics of Ising Models on Geometrically Frustrated Lattices

Bilin Zhuang '09, Physics and Chemistry
ADVISOR: *Courtney Lannert, Physics*

In recent years, a new class of magnetic materials that are "frustrated" at low temperature have been fabricated and characterized. They exhibit many fascinating properties. In particular, they possess a large number of ground states, resulting in nonzero entropy at absolute zero temperature, which violates the Third Law of Thermodynamics. My thesis research focuses on geometrically frustrated spin systems on triangular lattice, Kagomé lattice and triangular Kagomé lattice. In my presentation, I will explain why the lattices are "frustrated" and how the "frustration" gives rise to many interesting thermodynamic properties in these lattices. I will also present some small and simple theoretical models that can serve as good approximations to the properties of the large lattices. (Research supported by the Jerome A. Schiff Fund.)



1:30–2:40pm

**“Computer, take a look at these papers and tell me what they are about”:
A Web Application for Browsing and Searching Paper Topics Extracted by Machine-learning Algorithms***Amy Dai '09, Biological Chemistry and Computer Science, and Nandini Dookeran '09, Computer Science*ADVISOR: *Panagiotis T. Metaxas, Computer Science*

In seminars one usually skims through a large number of papers to familiarize herself with the topics they present before selecting ones to read more carefully. We have created a user-friendly Web application (<http://cs.wellesley.edu/~cs349/webapi/papers.php>) for browsing a large corpus of papers for CS 349, *Web Search and Mining*. The application allows users to easily view the title, abstract, authors, and keywords for each paper, making browsing papers easier and more visually attractive. While the current Web application allows for search by any of the given fields, the best way to retrieve a set of related papers is to search by keyword. To avoid the tedious task of manually looking over all papers, and choosing keywords ourselves, we use various machine learning techniques to group and extract topics from papers. This application can be used in the future to help conference attendees, such as Ruhlman's, browse and select the sessions they want to attend.

**Systems and Sustainability
(short talks) Pendleton West 212****Encouraging Sustainable Behavior through a Motivational Online Application***Catherine Grevet '09, Computer Science*
ADVISOR: *Scott Anderson, Computer Science*

As people go about their daily lives, their decisions and actions affect the environment. If individuals adopted more sustainable practices, they could reduce the U.S. carbon emissions and have a positive impact on global warming. While individuals might be aware that their

choices have an impact, they often lack the education or motivation to follow-up on sustainable actions. By developing a social network that emphasizes an individual's position in the community, people can be motivated to adopt similar sustainable practices as their peers. Moreover, individuals don't always know what behaviors they should adopt. Through an online network, people could compare their energy usage and green actions to others. My thesis work, in collaboration with Carnegie Mellon University, has focused on developing a social application for the Stepgreen.org Web site. I will present the results of a month-long, campus-wide evaluation of the project at Wellesley College.

Nature Protection: Democratic, Coercive, or Both?*Anli Yang '09, Environmental Studies and Economics*ADVISOR: *Jay Turner, Environmental Studies*

What role does a country's political system play in its commitment to nature preservation? The historian Donald Worster argues, “[T]he protection of wild nature owes [much] to the spread of modern liberal, democratic ideals...” Based on qualitative studies of the history of environmental protection, he and other historians have argued that democracy has been a driving force in the creation of national parks, wilderness areas, and wildlife refuges. Other scholars, however, drawing primarily on individual case studies, have argued that such nature reserves are often coercive, representing the imposition of government-sanctioned conservation practices on local communities. To address this apparent contradiction, this study evaluates which national characteristics, including the strength of a state's democracy, the size of its economy, and the extent of its biodiversity, best predict its commitment to establishing nature reserves. Understanding these national commitments is important to addressing the ongoing biodiversity crisis.

The Mechanics of Explosive Seed Dispersal in Orange Jewelweed (*Impatiens capensis*)*Marika Hayashi '10, Biological Sciences*
ADVISOR: *David J. Ellerby, Biological Sciences*

Orange jewelweed is one of a number of plant species that use ballistic seed dispersal. The seed pods explode, transferring mechanical energy stored in the pod wall to the seeds, increasing their kinetic and potential energies. The mechanical performance of a launch mechanism of this type has not been measured. The valves forming the seed pod wall had a mass specific energy storage capacity of 124 Jkg^{-1} , comparable to that of spring steel. This energy storage capacity depended on the level of tissue hydration, suggesting a role for cell turgor pressure in generating tension within the pod walls. The efficiency with which energy was transferred to the seeds was $0.51 \pm 0.26 \%$ (mean \pm SEM, $N = 13$). This low transfer efficiency may be due to the absence of a direct mechanical connection between the pod valves and the seeds.

Leeches Suck...Then Shrink!*Kara Feilich '11, Biological Sciences, and Jing Wang '10, Neuroscience*
ADVISOR: *David J. Ellerby, Biological Sciences*

Blood-sucking leeches can increase their body mass by up to 900% during feeding. This restricts their mobility and makes them vulnerable to predation. This may create a selective pressure for rapid recovery of locomotor capacity. We have found that leeches can recover up to 50% of prefeeding swimming speed within one hour of a meal by actively expelling excess fluid. We performed a series of experiments on the medicinal leech following a blood meal, in order to test whether energy requirements for rapid return to locomotor capability are met via increased oxygen consumption, mobilization of intracellular carbon stores, or behavioral thermoregulation, independent of blood meal digestion. These data offer

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insight into possible adaptive mechanisms contributing to the rapid locomotor recovery of leeches following a blood meal. (Research supported by the Office of the Dean of the College.)

How Cells Work

(short talks) Pendleton East 339

Coordinating Cell Growth and Division in *Saccharomyces cerevisiae*

Lulu Tran '09, Neuroscience, and Jessica Weng '09, Biological Chemistry and Psychology

ADVISOR: Jennifer Hood-DeGrenier, Biological Sciences

The target of rapamycin (TOR) protein is the central regulator of eukaryotic cell growth and mainly works in the G1 phase of the cell division cycle to promote accumulation of cell mass and cell cycle-entry. Clb5 is a cyclin that works in S phase of the cell cycle to initiate DNA replication. Previous studies in this lab have shown that cells in which the *CLB5* gene has been deleted ($\Delta clb5$) are hypersensitive to rapamycin, an immunosuppressive drug that inhibits TOR and is being investigated for its antitumor properties. Further characterization of the rapamycin hypersensitivity of $\Delta clb5$ cells was performed through growth assays, flow cytometry, synchronized cell experiments, and fluorescence microscopy. Overexpression of the Kip3 motor protein, which we have found to reverse $\Delta clb5$ rapamycin hypersensitivity, was also studied. Results implicate TOR and Clb5 in a novel, shared function at the G2/M transition. (This research was supported by a Roberta Dey Staley and Karl A. Staley Fellowship for Cancer-related Research at Wellesley College.)

Gene Expression Patterns of the Patellin Gene Family of *Arabidopsis thaliana*

Smadar Levy '09, Biological Sciences
ADVISOR: Kaye Peterman, Biological Sciences

Several years ago, members of the Peterman lab isolated a novel *Arabidopsis* protein that localizes to the expanding and maturing cell plate and is believed to be

involved in vesicle trafficking during cell plate maturation. This protein, Patellin1 (PATL1), is one of six PATL proteins found in *Arabidopsis* and one of forty-four PATLs found throughout the plant kingdom. Phylogenetic analysis has divided the PATLs into four distinct clades, suggesting different roles for different PATL proteins. Using transgenic plants expressing PATL promoter::reporter gene fusions, we are investigating patterns of PATL1 and PATL3 expression in *Arabidopsis thaliana*; publicly available microarray coexpression data will also be analyzed for all *Arabidopsis* PATLs using ATTED-II (*Arabidopsis thaliana* transfactor and cis-element prediction database) and *Arabidopsis* eFP (Electronic Fluorescent Pictograph) Browser. This will provide insight into the role of PATL proteins in *Arabidopsis* and highlight redundancies and singularities in function among the different PATL family members. (Research supported by the National Institutes of Health.)

Playing Matchmaker: sRNA Target Prediction

Amy Dai '09, Biological Chemistry and Computer Science
ADVISOR: Brian Tjaden, Computer Science

Small noncoding RNA genes are found throughout all kingdoms of life. They are referred to as sRNA in bacteria and act as posttranscriptional regulators. sRNAs are quickly being discovered, but their cellular functions are still mainly unknown. With recent studies identifying sRNAs as regulators of virulence factors in *Vibrio cholera* and *Pseudomonas aeruginosa*, better tools for sRNA target identification are needed. Current computational programs for identifying sRNA targets make predictions based on the maximization of sRNA:mRNA base-pairing. While there is abundant thermodynamic data for ribonucleotide interactions, there is a current lack of programs utilizing these parameters for sRNA:mRNA interaction prediction. For my senior thesis, I wrote a computer program that uses thermodynamic data to predict stable sRNA target interactions.

This program was validated on known sRNA:mRNA interactions in a well studied bacterial species. Novel sRNA targets in a less well studied bacterial species were predicted and validated with in vitro experiments. (Research supported by a grant from the National Institutes of Health.)



RhyB and *sodB* predicted interaction. Boxes indicate sRNA:mRNA interacting base pairs.

Environments Near and Far (poster session) Science Center Focus

The SolSource: A 3-in-1 Solar Solution for Environmental Health and Gender Equality in the Himalayan Region

Catlin I. Powers '09, Chemistry and Environmental Studies
ADVISOR: Didem Vardar Ulu, Chemistry

“My mother and I are very short, but my brothers are tall. My mother told me that this is because of the heavy burdens of fuel and water that we women carry. This is why I feel women need good solar cookers and more of a voice in the village”—Lhamotso of Waku Village. In



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response to concerns of village women like Lhamotso, I spent much of 2007 and 2008 designing solar cookers more suited to village life. One of these is the SolSource 3-in-1 which uses nomadic tent material to harnesses the sun's energy for cooking, heating, and low-cost thermoelectricity generation. It has the potential to abate 70 percent of rural household biomass emissions, allow more girls to gain education, and recover up to one-third of household income. Please attend my poster session to learn more. (Work supported by the MIT IDEAS, Muhammad Yunus Innovation Award, and Clinton Global Initiative.)

Colonization History of the Galápagos Flightless *Stomion* Beetles

Lily Duh '11, Chemistry, Weixia Guo '11, Biological Sciences, and Christina Tran '11, Biological Sciences

ADVISOR: *Andrea Sequeira, Biological Sciences*

This project compiles and analyzes the first molecular dataset for a group of Galápagos endemic flightless Tenebrionid beetles. With this multiple-gene dataset we are studying the colonization history and mechanisms of diversification of these endemics in five of the Galápagos islands. Preliminary results indicate that contrary to the majority of island colonizers, phylogeny estimates for *Stomion* do not appear to follow the progression rule of island biogeography whereby islands are colonized according to their age. This interesting preliminary assessment of the diversification patterns in *Stomion* allows relevant comparisons with already well-established patterns in other systems studied in the laboratory, i.e. *Galapaganus*. (Research supported by the AT&T Mentoring in the Sciences Program.)

The Expanding Atmospheres of Two Supergiant Stars

Jahanara Ahmad '11, Astronomy

ADVISOR: *Wendy H. Bauer, Astronomy*

VV Cephei and KQ Puppis are binary star systems consisting of a supergiant star with an extensive, expanding wind and a smaller, hotter companion star. When the hot companion's light shines through the supergiant's atmosphere, the absorption of its light by the atmosphere of the supergiant star can give us information about the composition and spatial structure of the supergiant's atmosphere. VV Cephei was observed by the Hubble Space Telescope at different parts of the companion's orbit, including total eclipse. KQ Puppis was observed only once by Hubble at a configuration similar to some of the VV Cephei observations. For both these star systems, Hubble was able to detect spatially extended emission from the wind of the supergiant. In my poster, I will be comparing the observations of KQ Puppis with those of VV Cephei to analyze the atmospheres of both supergiants.

Illness in the Cure

Teresa Le '11, Anthropology

ADVISOR: *Anastasia Karakasidou, Anthropology*

This presentation focuses on how society's perceptions of the female body influence the culture of breast cancer. It is for this reason that not enough attention is given to household products and environmental factors in the carcinogenesis of breast cancer. Instead of emphasizing breast cancer prevention, western society creates a culture of breast cancer that is based on treatment and reconstruction.

A large portion of the research will come from popular women's magazines and their portrayals of "normal" female bodies and of breast cancer, in order to show media responses to the realms of the sick vs. the healthy. Furthermore it looks at the relationship between the societal view of the "normal" female body and the stigmatization of women who have breast cancer.

This presentation will tackle "Pinkwashing" and the political economy of breast-cancer marketing, addressing how breast cancer has become a trend.

Brain and Behavior (poster session) Science Center Focus

The Functional Implications of α -Synuclein Overexpression and Oligomerization in Human Neuroblastoma Cells

Joanna Choi '09, Neuroscience

ADVISOR: *Gary Harris, Biological Sciences*

α -Synuclein (α Syn) is a small protein that is closely associated with Parkinson's disease (PD). Substantial evidence links α Syn to mitochondrial dysfunction, and there is evidence that α Syn oligomers are the toxic species causing neurodegeneration in PD. Though α Syn is the focus of much research, its pathophysiological role in PD remains unclear. The goal of this project is to understand the functional implications for α Syn overexpression in cells, gain insight on its relationship with mitochondrial health, and determine whether these effects are mediated by α Syn oligomers or monomers. Human dopaminergic neuroblastoma cells with and without overexpressed α Syn were treated with a panel of mitochondrial toxins and the effect of α Syn overexpression on cell health was determined by cell viability assays. Also, purified mitochondria and whole cells were exposed to α Syn oligomers, and their mitochondrial health was determined by fluorescence activated cell sorting in order to determine the toxic effects of α Syn oligomers. (Research supported by the Howard Hughes Medical Institute and the Center for Neurologic Diseases at Brigham and Women's Hospital.)



Into the Depths of the Mind's Jungle: A Search for TOP and PEP

*Jana Qiao '11, Biological Chemistry,
Diana Wang '11, Economics, and Tania
Dhawan '11, Biological Sciences*
ADVISOR: *Adele Wolfson, Chemistry and
Office of the Dean of the College*

In studies of illness related to reproductive physiology, abnormal production of the ovarian steroid hormone estradiol may be an underlying cause for a number of disorders common to women.

Gonadotropin-releasing hormone (GnRH) is an important regulator of estradiol release. Estradiol, in turn, exerts feedback control on GnRH. GnRH may be further regulated by the hormone degrading enzymes thimet oligopeptidase (TOP) and prolyl endopeptidase (PEP). In this project we analyzed how estradiol affects levels and activity of these two enzymes in various mouse brain regions, using immunohistochemistry and fluorometric activity assays. (Research supported by grants from AT&T Mentoring in the Sciences Program and Howard Hughes Medical Institute.)

Cells in Female Mouse Brain Coexpress Progesterin Receptors and Nuclear Receptor Coactivators

*Christina Tognoni '09, Neuroscience
and Spanish, and Courtney Ackeifi '10,
Biological Chemistry*
ADVISOR: *Marc Tetel, Neuroscience*

The ovarian steroid hormones, estradiol and progesterone, act in the brain to elicit profound effects on behavior and physiology. One physiological function of estradiol is the induction of progesterin receptors (PR) in brain and other steroid-sensitive tissues. In this estradiol induction of PR, estradiol binds to estrogen receptors (ER) to induce the transcription of the PR gene in reproductively-relevant brain regions. *In vitro* studies have shown that nuclear receptor coactivators, such as steroid receptor coactivator-1 (SRC-1) and SRC-2, enhance the hormone-dependent transcriptional activity of ER. In the present study, we used triple-label immu-

nohistochemistry to investigate the coexpression of SRC-1, SRC-2 and PR in individual cells in female mouse brain regions that regulate reproductive physiology and behavior. These experiments will further our understanding of how hormones act in brain and their possible role in brain disorders that are influenced by hormones, such as Alzheimer's Disease and depression. (Research supported by the Howard Hughes Medical Institute and the National Institutes of Health.)

Interpretation of ASL Facial Grammar by Nonsigners

Sienna Laughton '11, Neuroscience
ADVISOR: *Jennie Pyers, Psychology*

For most people who speak more than one language, it is impossible to speak them both at the same time. However, bimodal-bilinguals, people fluent in a signed and a spoken language, can produce elements of both languages simultaneously. Bimodal bilinguals produce ASL facial grammar while speaking English: they raise their eyebrows when speaking an English conditional sentence, and they furrow their eyebrows when asking a wh-question. Yet signers tend to inhibit the expression of the furrowed brow more than the expression of the raised eyebrows. One possible reason for this inhibition is that the fur-



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other LNRs can only form two disulfide bonds. In this work we present our findings on the effect of various reduction potentials as well as the elimination of the first disulfide bond in the *in vitro* folding of hN1 LNRA through a comparative analysis. The results of this study will help to elucidate the impact of disulfide bond formation during LNR folding.

Amino Acids That Are Critical for Structural Stability and Functionality within the Heterodimerization Domain of Notch

Marina Pellon Consunji '09, Biological Chemistry and International Relations-Economics, and Lucien C. Montenegro '10, Chemistry
 ADVISOR: *Didem Vardar Ulu, Chemistry*

The integral role of Notch proteins in the normal development and tissue homeostasis of metazoans is orchestrated through the tightly regulated proteolytic processing of its Negative Regulatory Region (NRR). Ligand binding at an extracellular region activates Notch by facilitating a proteolytic cleavage at the heterodimerization (HD) domain within the NRR. This cleavage is a prerequisite for the subsequent intramembrane cleavage that permits the translocation of the intracellular region of Notch to the nucleus to activate transcription. In this work we present the algorithms we have developed to evaluate the relative importance of specific amino acids for the structural stability and functionality of the HD domain. These include predictive models derived from bioinformatic analysis as well as experimental data from circular dichroism, chromatography, and mass spectrometry studies that compare the wild-type HD domain with two mutants identified in leukemia patients. Our results provide valuable insight to the mechanism of Notch activation.

Characterization of the Ca²⁺ Binding Affinity and Coordination Site of the LIN-12/Notch Repeat

Christina Hao '09, Biological Sciences
 ADVISOR: *Didem Vardar Ulu, Chemistry*

Notch receptors are transmembrane glycoproteins of a highly conserved signaling pathway that regulate cell fate in multicellular organisms. Notch proteins include three tandem LIN-12/Notch Repeats (LNRs) responsible for maintaining the receptor in its resting conformation prior to ligand binding. These modules contain highly conserved arrangement of three disulfide bonds and a Ca²⁺ ion that is essential for its correct folding. In our previous work, we used the first repeat of human Notch1 and showed that it exclusively binds to calcium ion. In this work, we used a combination of computer modeling and experimental approaches to characterize and compare the Ca²⁺ binding affinities and coordination geometries of LNR repeats across different protein families. We expect this work to elucidate the basis for Ca²⁺ ion selectivity by the LNRs that is integral for their proper regulation in the Notch signaling pathway.

LIN-12/Notch Repeat B: The Effects of Disulfide Bonding and Hydrophobic Residues on Its Autonomous Folding

Jessica Lin '10, Chemical Physics
 ADVISOR: *Didem Vardar Ulu, Chemistry*

Notch proteins are transmembrane proteins involved in controlling cellular differentiation, growth, and death. An extracellular negative regulatory region (NRR) contains three contiguous LIN-12/Notch Repeats (LNRs)—LNRA, LNRB, and LNRC. Two factors of LNRB folding of much interest are its disulfide bonds and distribution of hydrophobic residues. To study the effect of disulfide bonds on the independent folding of LNRB, one of its three pairs of disulfide bonds was eliminated by mutating cysteine-45 and cysteine-69 to two alanine residues. Because of its more central location in relation to the rest of the protein, LNRB

participates in more extensive interactions via its exposed hydrophobic tryptophan residues. To study the possible destabilizing effect of hydrophobicity in LNRB imparted by hydrophobic residues, tryptophan-52 was mutated to an alanine. This work presents data on different lengths of LNRB with the above-mentioned mutations to help define the minimal requirements for the autonomous folding of LNRB.

Predicting and Measuring Molecules (poster session) Science Center Focus

Designing Ion Optics for Imaging Chemical Dynamics

Sarah Hyde '11, Chemistry
 ADVISOR: *Wilton L. Virgo, Chemistry Department*

Design, simulation and optimization of electrostatic lenses are crucial to the ion imaging techniques employed to investigate molecular chemical reaction dynamics. The images obtained from studies of photodissociation dynamics are particularly dependent on the electrostatic lens configuration, which determines the spatial quality of the image. In order to optimize image spatial resolution, a simple three-plate electrostatic lens with open electrodes is simulated so that all particles with the same initial velocity vector are mapped onto the same position on a 2D detector, regardless of their initial distance from the electrostatic lens axis. Characterization of the electrostatic lens apparatus is performed using a 3D ion trajectory simulation software package. The simulations are designed to accurately reproduce experimental results and guide the design of a new experimental velocity map imaging apparatus. (Research supported by AT&T and the Wellesley Mentoring in the Sciences Program.)



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Electronic Structure Calculations on Cyanamide and Substituted Cyanamides—The Anomaly of the Nonlinear NCN Bond

Stephanie Lau '11, Chemistry
 ADVISOR: *Flick Coleman, Chemistry*

The valence shell electron pair repulsion (VSEPR) theory taught in introductory chemistry predicts the NCN bond of cyanamide (H_2NCN) to be linear. However, experiments have shown that the NCN bond of the molecule is, in fact, slightly bent. In an effort to understand this deviation from theory, the tools of computational chemistry were used for electronic structure calculations and molecular orbital visualizations. Besides investigating the nonlinearity of cyanamide's NCN bond with multiple levels of theory, this project also explored the properties of substituted cyanamides to see how the different substituents affect the NCN bond angle in these molecules. Results from this research will hopefully broaden our current understanding of molecular structure and bonding in such compounds. (Research supported by the Office of the Dean of the College.)

The Inner Workings of the Ballistic Pendulum

Emily Cuddy '12 and Eleanor Byler '11
 ADVISOR: *George Caplan, Physics*

How can you determine the velocity of a speeding bullet? It is easier than you might think. Designed in the late eighteenth century, prior to many modern technological advances, the ballistic pendulum was a simple tool used to determine the launch speed of a bullet. Applying the fundamental physical principles of conservation of linear momentum, conservation of angular momentum, and conservation of energy, we used a modified ballistic pendulum to calculate the initial velocity of a steel ball launched from a spring-loaded gun. Can the law of conservation of linear momentum be applied in this situation? How does conservation of energy even relate? We will not only discuss the advantages and disadvantages of each of the methods we

implemented but also draw conclusions regarding our experimental results.

Social Analysis

Play, Laugh, Learn (short talks) Collins Cinema

The Effect of Imaginary Companions on Preschoolers' Play

Svetlana Roskin '10, Psychology
 ADVISOR: *Tracy Gleason, Psychology*

Many preschoolers create relationships with imaginary companions, and these special friends generally fit into one of two categories: invisible companions or personified objects (e.g., a stuffed animal that the child treats as real). I examined videos of children with and without imaginary companions, who were asked to engage in three types of games: teaching, caretaking, and free-play. Through these videos, I want to compare children with and without imaginary companions, as well as children with either invisible or personified imaginary friends, in terms of their levels of engagement for the three tasks and their game preferences. I would also like to examine whether the type of relationship a child has with his or her imaginary companion, whether hierarchical or egalitarian, relates to how children play. These comparisons will show us how children represent relationships through play and tell us how they conceptualize their real and imaginary relationships with others. (Research supported by the Brachman Hoffman Fund and Wellesley College.)

Making Children Happy: How We Can Use Social and Emotional Learning to Help Children Be Successful

Emily Evans '10, American Studies
 ADVISOR: *Deborah Donahue-Keegan, Education*

Social-emotional intelligence has a direct relationship to happiness and success. As many research studies have proven over the past 20 years, the development

of social and emotional competencies increases individuals' happiness and success in life. Yet many schools today are failing to address children's social-emotional needs. What specific social-emotional skills do children need to achieve both academic achievement and happiness? How can schools, parents, and friends best foster positive school environments, where children can develop these crucial social-emotional skills?

The Role of Gesture Input in Children's Exploratory Play

Kate Zmich '09, Psychology
 ADVISOR: *Jennie Pyers, Psychology*

Gesture expands and complements information provided in the speech stream. Iconic gestures look like their referents, but it is unclear whether children can tap into the analogous relationship between gesture and referent. This study asks when and how children between the ages of two and four years interpret the gestures produced by adults, and whether they use gestural information to guide their exploratory play with novel objects. Children were presented with four novel objects with novel labels. Each label was accompanied by a shape gesture, a function gesture, a non-iconic gesture, or no gesture. Children's play with the novel object and their memory for novel labels was coded. The findings will illuminate how children understand different types of gesture and how gesture informs children's exploratory play. (Research supported by the Psychology Department.)

The Impact of High Stakes Testing on Elementary School Students' Stress

Marjorie W. Schaeffer '09, Psychology
 ADVISOR: *Beth Hennessey, Psychology*

High-stakes testing is common across the United States. The Massachusetts Comprehensive Assessment System (MCAS) is one such test designed to measure student performance and to meet the requirements of the national NCLB initiative. Massachusetts students first take this test in the spring of third



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grade. While some research has focused on teachers' feelings about and stress felt because of high-stakes testing, little is known about the impact of these tests on young children. Third, fourth, and fifth graders will describe the feelings of a hypothetical same-gendered child taking either his or her first MCAS, or a spelling or social studies test. Results are expected to suggest that high-stakes tests cause far more anxiety than do low-stakes tests. Children are additionally expected to describe different ways of handling the stress related to testing. (Research supported by the Psychology Department and the Office of the Dean of the College.)

Our Bodies, Ourselves (short talks) Pendleton West 117

Russian Women's Sexual and Reproductive Health from the 1980s to the Present

Abigail Lees '09, Russian Area Studies
ADVISOR: *Nina Tumarkin, History*

In 1990 at a conference in Tbilisi, the U.N. Population Fund emphasized reproductive freedom as "the freedom from which all others flow." The conference highlighted Russia as a prime example of a country suffering from limited reproductive options. This presentation will explore the marginalization of Russian women's sexual and reproductive health from the 1980s to the present. Health policy, statistics, and media show how Russia's changing relationship to contraception, abortion, sexual diseases, and feminism affect the country's current demographic crisis and its very future.

Ovulation and Perceptions of Attractiveness

Robyn Migliorini '09, Psychology and Philosophy
ADVISORS: *Margery Lucas, Psychology, and Elissa Koff, Psychology*

Previous research has suggested that ovulation, the time of highest conception risk in a woman's menstrual cycle, is correlated with distinctive changes in female

perceptions about themselves and about potential mates when compared to other phases of the cycle. For example, when women ovulate, they may dress in sexier, more revealing clothing, and may experience heightened judgments of their own attractiveness. This research focuses specifically on body image and how it is affected by the hormonal cycle. Data were collected on heterosexual women's ratings of their own physical attractiveness, as well as their preferences for male body types, considering men as both as potential long-term partners, and for short-term sexual encounters. Participants completed the study once while in the high fertility phase of their menstrual cycles, and once while in the low fertility phase of their cycles. In addition, the effects of hormonal contraceptives on these judgments will be examined. (Research supported by a faculty award from Wellesley College.)

Multivariate Analyses of Family Functioning among Adolescent Hispanic and Brazilian Girls

Jennifer Gorcos '09, Psychology
ADVISOR: *Nancy Genero, Psychology*

Positive family functioning is incontrovertibly one of the most important indicators of well-being among adolescent girls. For my independent study, I performed multivariate analyses to assess the relationship between family functioning and Hispanic and Brazilian girls' perceptions of social support and mother-daughter mutuality. Family functioning predictors included family participatory decision-making, closeness, and fairness. Girls' overall sense of relational efficacy was also included as a predictor in the analyses. Results were significant and provide a complex view of ethnic girls' family relationships.

Social and Political Interactions (poster session) Science Center Focus

Hot or Not: How Your Boyfriend's Qualities Influence Perceptions of You

Freena Chohan '09, Psychology and Economics, Cara Parcell '10, Psychology, and Laura D. Stevens '09, Psychology
ADVISOR: *R. Steven Schiavo, Psychology*

Previous research examines effects of a female's attractiveness and perceived intelligence on her male partner. We examined the reverse effect: how a male's appearance and intelligence influence perceptions of his female partner. We manipulated the male's appearance using Photoshop to make him more or less attractive. We created Facebook profiles displaying information pertinent to his intelligence and manipulated these to enhance or detract from his career prospects. We asked 48 Wellesley College students to fill out a questionnaire regarding these manipulations. We found that the male's attractiveness influenced the female's perceived career prospects, while his intelligence influenced her perceived intelligence.

Grooming versus Opening Line: Which Will Win the Fight?

Chong Wu '09, Psychology, and DongHwa Kim '10, Psychology
ADVISOR: *R. Steven Schiavo, Psychology*

Did you know that it only takes one sentence for someone to make a series of judgments about you, ranging from your physical attractiveness to your competence? Past studies have shown that opening lines play an important role in the perception of the line user. In particular, the obnoxious opening line users were viewed significantly more negatively compared to the direct line users. Other studies have shown that grooming also plays an important role in forming first impressions, with well-groomed men viewed more positively than casually-groomed men. In this study, we sought to explore whether the positive qualities attached to a well-groomed male can override the negative

1:30–2:40pm

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effects of his saying an obnoxious opening line to a female. Come and find out which won the fight!

Planning and Preservation in D.C.: The Development of Rock Creek Park

Lisa Snider '11, Sociology

ADVISOR: *Jonathan B. Imber, Sociology*

As the capstone project for my Urban American History class at MIT last semester, I wrote about the development of Rock Creek Park, one of the nation's oldest national parks. A woodsy, several thousand square acres above the National Zoo that runs along Rock Creek, the Park continues to provide a venue to relax for Washingtonians who want a break from the busy city. The multiple stages of renewal in the park's story reflect larger social trends in American history. Thus, through Rock Creek Park's history, we learn about the values of American society during much of the twentieth century. The thread that runs through its history is the continual need for maintaining a balance between preserving nature and enabling the park's visitors to access and benefit from it conveniently.

The Role of Explicit Memory in Priming Effects

Priya Josyula '10, Neuroscience, and Sara Teichholtz '09, Neuroscience

ADVISOR: *Margaret Keane, Psychology*

Human memory is made up of multiple subtypes, each of which operates through a different mechanism. Two subtypes are explicit (conscious) and implicit (unconscious) memory. An example of implicit memory is priming, where performance is influenced by recent experience, even though one is not explicitly remembering that experience. For instance, if individuals are asked to identify a very briefly flashed word (e.g. 13 milliseconds), performance is improved if they have had recent exposure to the word. Surprisingly, while explicit memory is impaired in amnesia, implicit memory, including priming, is largely retained. However, in a recent study, amnesic and healthy control participants unexpectedly displayed

different priming patterns. Our study questions whether these differences are due to the use of explicit memory by healthy control subjects.

Women Judging Women: Perceptions of Women Based on Clothing and Posture

Evann Schwerm '09, American Studies and Psychology, and Linda Yan '09, Economics and Psychology

ADVISOR: *R. Steven Schiavo, Psychology*

"Don't judge a book by its cover," goes the aphorism, but the impact of appearance is so much a part of our social experience that many of the judgments we make are instantaneous and subconscious. Research examining the effect of nonverbal cues on perceptions of individuals indicates that clothing and posture cue attributions of masculinity, femininity, and lifestyle choice. We gathered experimental data on Wellesley students, which was consistent with the associated body of literature. We will present our findings on how students attributed gendered characteristics such as leadership potential, likelihood to comfort a friend, or the presence of a tattoo based on masculine or feminine clothing and posture.

Literature and the Arts

Writing and Slamming Poetry (short talks, literary reading) Collins Cinema

Mayakovsky and America: "A Person, an Action, an Event"

Carlotta Chenoweth '09, Russian and Cognitive and Linguistic Sciences

ADVISOR: *Sarah Clovis Bishop, Russian*

Vladimir Mayakovsky, the foremost Russian futurist poet, was given the opportunity in 1925 to travel from the still-young Soviet Union to America. He produced a collection of propagandistic articles for the Soviet newspapers, but also a cycle of less affected poems that give us a better look at his fascination with the bustling, filthy America of the 1920s.

It has been said and often cited that Mayakovsky was "better known as a person, as an action, as an event." Since his well-known suicide, Mayakovsky's persona has risen to superhuman status: he is both a man and the revolution, the alluring artist and the fearless agitator. This notorious character has, in turn, captivated American poets, and Frank O'Hara's attachment to Mayakovsky, in particular, will be addressed.

"Nothing is until it has a word": The Poetry of Gillian Clarke

Dana Britt '09, English

ADVISOR: *Timothy Peltason, English*

I vividly remember the first day I heard of Gillian Clarke and of her poetry, because it was the same day I saw her for the first time. No matter how hard I try, I cannot recreate the rolling, rhythmical way she shaped her tongue to pronounce the Welsh words of her poetry, but I have tried to recreate in my thesis the importance of her words. That day in Wales, she told me and the rest of the audience that "nothing is until it has a word," and each time I read one of her poems I feel that I am being reintroduced to my own language. But more than that, her words give a name, a face, and a voice to countless women who

3–4:10pm

refuse to be forgotten. (Research supported by the Office of the Dean of the College.)

Nuyorican Slam Poetry: Roots and Renditions

Megan Aebi '09, Spanish

ADVISOR: *Joy Renjilian-Burgy, Spanish*

The *décima, bomba, y plena*, popular verse forms of Puerto Rico, were created by troubadours chronicling the history of Puerto Rican society and culture, beginning three centuries before Spanish colonization of the island. This presentation will examine the contributions of these poetic and musical forms on writers in the Nuyorican Poets Café of New York City. Themes vary from race, gender, and nationhood to love and loss in daily life. Nuyorican poets' contemporary production and performance reveal how this traditional poetry has evolved, both thematically and stylistically, into innovative literary expression, such as slam poetry. Performance included.

Novel Ideas

(short talks) [Science Center 104](#)

Convictions of Consanguinity: Sterne, Percy, and Sentimental Irony

Emma Ingrisani '09, English

ADVISORS: *James Noggle, English, and Luther Tyler, English*

Why Laurence Sterne and Walker Percy? The two authors, after all, are divided by century, country, and genre—Sterne firmly eighteenth-century British, and Percy indisputably twentieth-century Southern—and have never previously been united in critical discourse. Nevertheless, a sense of some odd resonance between their works' ironic and roguish narrative voices led me to investigate points of commonality between them. In examining Sterne's *Tristram Shandy* and *A Sentimental Journey* and Percy's early books *The Moviegoer* and *The Last Gentleman*, I explored the idea that Sterne and Percy are not only stylistically and thematically similar, but that they share the same source: the sensitive hero figure initiated

by the British literary tradition and inherited by the American South. I will discuss the ways in which Sterne and Percy revisit and revise this character—defining him in their own version of “sentimental irony.” (Research supported by a Jerome A. Schiff Fellowship.)

The Human Condition: Analysis of Theodore Dreiser and Literary Naturalism

Page Monji '09, English and Classical Civilization Studies

ADVISOR: *William Cain, English*

Theodore Dreiser, during the turn of the century, experienced America's urban scene at one of the most transitional periods in history. Shocked by the scale of urban development and commercialism, Dreiser became one of the greatest social critics and authors of his time. Dreiser questioned the power that people have over the external forces within their environments. He sought to find an over-arching continuum among all human experiences to explore the depths of the human consciousness in a society that is more concerned with money than with individual happiness. Dreiser also discusses the role of desire and the debilitating effects of the relentless pursuit of success. Within my thesis, I focus on three of his novels—*Sister Carrie*, *Jennie Gerhardt*, and *An American Tragedy*—in order to answer Dreiser's pivotal question: what is the human condition in modern America?

The Key to Promise Keeping in George Eliot's *Middlemarch*

Flannery Wheeler '10, English

ADVISOR: *Lisa Rodensky, English*

Midway through *Middlemarch*, the young Dorothea Casaubon resolves to complete her dying husband's *Key to All Mythologies*—a work so ineffectual and time-consuming it would preclude her desire to lead “an epic life... of far-resonant action.” Rather than indicating failed ambitions, Dorothea's decision marks her moral maturity, for she now realizes that compassion and sacrifice

are inseparable and seldom bring glory. Before Dorothea can make her promise, her husband dies, and, through his will, she discovers his intent to make a second, more sinister demand. Paradoxically, in a novel committed to sacrifice, Dorothea then revokes her decision to complete the *Key*. Does Eliot have her do so because the sacrifice would be too great? Because Casaubon is unworthy? Or because she never officially made the promise? Critics have long struggled with these questions, and I will explore them through a comparison of Dorothea's intended sacrifice with Mrs. Bulstrode's fulfilled one.

Science and Technology

Cruising the Cosmos with ASTR 206 (panel) Pendleton West 212

Katie Judd '11, Latin American Studies, Molly Wasser '09, Cinema and Media Studies, Allison Youngblood '10, Astrophysics, and Kirsten Levandowski '10, Astrophysics
ADVISOR: *Kim McLeod, Astronomy*

The class of ASTR 206, “Basic Astronomical Techniques,” spent the fall semester completing observational research projects with Wellesley's 24"-diameter Sawyer Telescope. Objects studied range in distance from a galaxy cluster 170 million light-years away to a comet right here in our own solar system. We'll show our light curve from an extra-solar planet's passage in front of its star, tell how we found the distance and age of a Milky Way star cluster, and describe how we charted the motion of Comet Barnard-Boattini. Come learn about the intricacies of using a telescope to make scientific measurements, and see a video of the comet's motion as seen from Wellesley!

3–4:10pm

It's a Bacterial World (panel) Pendleton East 339

*Cyanobacteria were the first photosynthetic organisms to produce oxygen. Not only have they survived for billions of years, but they have been found in extremely diverse locations, ranging from glaciers to geysers. With that much longevity and diversity, these bacteria have adapted significantly to survive under many stressful conditions. This panel will discuss the research being conducted in Dr. Mary Allen's laboratory on the many stress responses of the cyanobacterium *Synechocystis* sp. strain PCC 6803.*

Proteomic Analysis of the Acid-stress Response of Cyanobacteria

Lauren F. Allison '10, Biological Sciences, and Elizabeth Jeruto '09, Biological Sciences
ADVISOR: *Mary M. Allen, Biological Sciences*

Airborne pollution and acid rain are causing the acidification of bodies of fresh water around the world. Cyanobacteria are being threatened by this man-made ecological disaster. Since cyanobacteria have adapted to survive in environments with alkaline pH, the decreasing pH of their habitats will have important consequences for cyanobacteria and the entire freshwater ecosystem. In the lab we are trying to determine how the bacteria will respond to acidification by stressing them at low pH and attempting to identify proteins that are expressed differently under acid-stress. Proteomic techniques such as two-dimensional gel electrophoresis, trypsin digestion, and MALDI-TOF Mass Spectrometry will be discussed. (Research supported by the Roberta Day Staley and Karl A. Staley Fund for Cancer-related Research and the Amabel Boyce James Fund for Research in the Sciences)

Using ^{31}P and ^{23}Na NMR Spectroscopy to Investigate the Role of Na^+/H^+ Antiporters in Acid-stressed Cyanobacteria

Jessica L. Tse '09, Biological Chemistry, and Hatice G. Yayla '11, Chemistry
ADVISORS: *Mary M. Allen, Biological Sciences, and Nancy H. Kolodny, Chemistry*

Membrane proteins involved in transporting Na^+ and H^+ ions across the membrane, Na^+/H^+ antiporters, may help regulate the internal and external pH of acid-stressed cyanobacteria. The cyanobacterium *Synechocystis* sp. strain PCC 6803 contains at least five Na^+/H^+ antiporters. Studies suggest that these proteins help regulate the internal pH of acid-stressed cells, but how are the internal pH and Na^+ concentration of cells with a 1.5 μm diameter measured? ^{31}P Nuclear Magnetic Resonance (NMR) spectroscopy is used to determine the chemical shift of the pH sensitive inorganic phosphate peak. ^{23}Na NMR spectroscopy using chemical shift reagents is used to detect the relative amounts of Na^+ inside and outside the cells. We are now acid-stressing cyanobacteria at different pHs to follow the transport of Na^+ across the cell membrane. (Research supported by the Merck/AAAS Undergraduate Science Research Program, Howard Hughes Medical Institute Research Grant, and Office of the Dean of the College.)

It's Not Easy Being Green, So Let's Stick Together: A Study of Biofilm Formation in Cyanobacteria

Jessica Weyer '09, Biological Sciences
ADVISOR: *Mary M. Allen, Biological Sciences*

Many different forms of bacteria form a biofilm as a coping mechanism during times of stress. A biofilm is an aggregate of bacterial cells surrounded by a sticky extracellular matrix anchored to a biotic or abiotic surface. The main component of this matrix is exopolysaccharide, or EPS. Often the presence of type IV pili, small hair-like appendages coating a cell's surface, are rumored to have an important role in the initial anchoring and subse-

quent growth of biofilms, along with motility of cells that are not in a biofilm. In this research I am finding if the cyanobacterial species *Synechocystis* sp. strain PCC6803, which exhibits surface motility and has type IV pili, forms biofilms. I grow the bacteria under a variety of stressful conditions and then search for the presence of EPS. I then support these results by verifying the presence of type IV pili using the electron microscope. (Research supported by the Howard Hughes Medical Institute.)

Cleaning Lead-polluted Waters with Cyanobacteria

Jean Yau '09, Biological Sciences and French, and Brachi Schindler '11, Environmental Studies
ADVISOR: *Mary M. Allen, Biological Sciences*

Water pollution with heavy metals is a problem worldwide, including on the Wellesley College campus in Lake Waban and Paintshop Pond. Lead is one such heavy metal that can cause hypertension and impair nerve and kidney function if ingested. Bioremediation is a method of removing pollutants using microorganisms, and cyanobacteria might be model organisms to remove heavy metals from polluted waters. One cannot, however, release cyanobacteria directly into the water, as this would disrupt the ecosystem. Cyanobacteria can be contained within beads made of calcium-alginate, an algae-derived substance, and the beads could easily be removed from the water system after remediation. The beads themselves can also remove metals from water. Our research examines the ability of cyanobacteria, free and immobilized within beads, to remediate lead from water systems. (Research supported by the Office of the Dean of the College, Jerome A. Schiff Fund, and the Merck/AAAS Undergraduate Science Research Program.)



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Nutrition and Brain Disorders: You Are What Your Mother Ate (panel) Pendleton East 139

*Jennifer Moriuchi '09, Neuroscience,
Loren Saulsberry '10, Neuroscience, and
Hillary Chu '09, Neuroscience*
ADVISOR: *Joanne Berger-Sweeney,
Biological Sciences and Office of the Dean
of the College*

Animal models provide a unique opportunity to study basic mechanisms of human disease, such as how genetic and nutritional factors interact to influence disease symptoms, and to test preclinical therapies. Rett Syndrome (RTT) and Schizophrenia (Schz) are both neurological disorders that originate early in fetal development and are linked to specific genetic mutations. However, nutritional factors can also influence the severity of symptoms. Here, we test the effects of maternal nutritional supplementation (choline) or deprivation (folate) around the time of birth in genetically modified mice that model RTT and Schz, respectively. In RTT-like offspring, we find that choline supplementation improves both physical and cognitive symptoms. In Schz-like offspring, a single genetic mutation unexpectedly protects against the harmful physical and cognitive effects of folate deficiency. These nutritional manipulations, both choline and folate, interact with genetic mutations to influence neurological disorders and underscore the critical nature of maternal nutrition. (Research supported by the Office of the Dean of the College, the Howard Hughes Medical Institute, and the Jerome A. Schiff Fund.)

Game Design and the Transparent Interface (interactive teaching presentation) Jewett Arts Center 247

*Langdon Ferguson '09, Art History, Indi
Marisa V. Frank '09, Media Arts and
Sciences, Francesca Gobeille '09, Media
Arts and Sciences, Soo Been Kim '10,
Media Arts and Sciences, Serena Wales
'09, History and Media Arts and Sciences,
and Emmy Zhang '11, Russian*
ADVISOR: *Panagiotis T. Metaxas, Computer
Science*

What makes an interface design effective, and how can such principles be applied to computer games? Last fall, our CS 215 class sought to explore the fundamentals behind multimedia design and programming through a hands-on study of game creation. We applied interdisciplinary themes such as Gestalt and color theory along the way, and our experience cumulated in the final product of our own appealing and fully functioning computer games playable on the Web. In our presentation, we will discuss the design process that went into creating these games, which we will then invite you to play!

Investigations of Disease (short talks) Pendleton East 239

The Significance of Stable DC-T Cell Interactions in the Differentiation of Effector T Cells

Balimkiz Senman '09, Neuroscience
ADVISOR: *Andrew Webb, Biological Sciences*

The immune system constantly surveys the body for the presence of antigen. It operates mainly through T cells and B cells to fight off foreign invaders, called antigens, that gain access to the body and dendritic cells (DC), which are specialized in alerting the immune system about the presence of antigens. T cells originate in the bone marrow as stem cells and migrate to the thymus, where they differentiate into different types of T cells. They then leave the thymus as naïve T cells and circulate in the blood and secondary lymphoid organs searching for antigen presentation DCs. At the onset of this initial T

cell-DC interaction there are three phases, each characterized with a specific T cell-DC interaction duration. In this study, we have looked at the significance of phase II, characterized by the stable interaction between T cells and DCs, with respect to activation, proliferation, cytotoxicity and memory generation.

Synthesis and Evaluation of α -Synuclein Fragments to Determine Regions of Importance for Aggregation

*Laura Stafman '09, Neuroscience and
Middle Eastern Studies, Arianne Jong '10,
Biological Chemistry and East Asian
Studies, and Kyi-Sin-Lin Than '11,
Psychology*
ADVISOR: *Julia Miwa, Chemistry*

Several neurodegenerative diseases are caused by the abnormal aggregation of proteins into amyloid fibrils. In Parkinson's disease, the protein α -synuclein aggregates to form Lewy bodies. The goal of this research is to determine which regions of α -synuclein are involved in aggregation. With this information, drugs may be produced to target these regions specifically. Twenty residue fragments were synthesized using solid phase peptide synthesis and purified using HPLC. Lewy bodies are known to exhibit a β -sheet secondary structure; the goal is to determine which fragments of α -synuclein are more prone to be in this conformation. Using FTIR spectroscopy, the secondary structure of fragments was determined by examining the amide I band. Those fragments with a predominantly β -sheet structure were further examined to determine their aggregation kinetics using the fluorescent dye Thioflavin T. Aggregates that form more easily and rapidly are thought to be more essential in forming the toxic species. (Funded by Howard Hughes Foundation, Wellesley College Mentoring in the Sciences Program, and Wellesley College Science Center.)

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Risk Factors Associated with Athletic Injuries in Female Division III Athletes

Julia Thomas '09, Chemistry

ADVISOR: Connie Bauman, Physical Education, Recreation, and Athletics

As female participation rates at all levels of sporting activity have dramatically increased, so have certain sports injuries. In particular, the incidence of ACL injury in female athletes has been reported to be four to six times greater than male athletes participating in the same sports. This pilot study serves to determine if any relationship exists between selected strength, flexibility, and sports related dynamic measures and the type and severity of injuries sustained by Wellesley College athletes. Athletes on Wellesley's soccer, basketball, and lacrosse teams were included in this preliminary study. Conclusions were drawn using Dartfish visual analysis, isometric strength and flexibility measures, and the athlete's injury reports. The findings will provide a foundation upon which further investigation of injury prevention and rehabilitation protocols can be implemented.

Sound and Sense

(short talks) Science Center 277

Reflections of Language in Music: Comparing Rhythm and Melody in English Dialects and Music

Rebecca McGowan '09, Cognitive and Linguistic Sciences and Mathematics

ADVISOR: Andrea Levitt, French

Informal observations have often been made that a country's language is reflected in its instrumental music. Language and music are both ways of organizing sound, and it may be that the distinctive temporal and melodic patterning of a language also appears in the related music. Little research has explored this possibility, but the few studies conducted have found similarities between the rhythmic and melodic characteristics of French music and language on the one hand and British music and language on the other. Using acoustic measurements, my research compares the rhythmic and melodic characteristics of

the music and language of the Shetland Islands in Scotland, County Donegal in Ireland, and the state of Kentucky. It aims to determine if these characteristics are correlated in the speech and music in each dialect area; such a correlation may provide support for the hypothesis that music and language share processing resources in the brain. (Research supported by the Jerome A. Schiff Fund.)

On Being an Accent Sponge: Phonetic Convergence in Bilingual Speakers

Emily Cibelli '09, Cognitive and Linguistic Sciences

ADVISOR: Andrea Levitt, French

Have you ever spoken with someone who has an accent—and found yourself adopting it in your own speech? This tendency is known as phonetic convergence, and it is a well-documented phenomenon that occurs in both short- and long-term conversational interaction. My thesis examined phonetic convergence among bilingual speakers. Spanish-English bilinguals with different language backgrounds were exposed to accented speech to see whether they would adopt the accents in their own productions. This research sheds light on the flexibility of the linguistic sound system, and explores the effects of language history on people's ability to change characteristics of their speech. (Research supported by the Office of the Dean of the College.)

Second Language (L2) Processing of Prepositional Phrase (PP)-Attachment Ambiguities: Toward an Improved Understanding of the Argument/Adjunct Distinction

Jenny S. Lee '09, Cognitive and Linguistic Sciences

ADVISOR: Sun-Hee Lee, East Asian Languages and Literatures

A controversial topic in linguistics is known as the argument/adjunct distinction. Arguments are phrases that form integral components of a verb's meaning, while adjuncts are simply "modifiers." For example, in "[Mary] gave [the package] [to the mailman] [in the afternoon]," "in the

afternoon" is an adjunct, while the other bracketed phrases are arguments. This distinction is important for the study of linguistic ambiguity, especially PP-attachment ambiguity. For example, the PP "with the telescope" in the sentence "The detective saw the man with the telescope" could mean that the detective used the telescope to see the man or that the man he saw had a telescope. Using a reading time paradigm, this study investigates Korean-English bilinguals' processing of PP-attachment ambiguities involving two kinds of prepositional objects, which may differ in argument status: dative recipients ("the man" in "John gave a letter to his son to the man") and instruments ("a lid" in "Sarah sealed the container with glue with a lid"). (Research supported by the Office of the Dean of the College.)

Social Analysis

Gender and the Workplace (panel) Pendleton West 116

Dancing is a Sweat Job: Gender Performance in the Ballroom Dance Workplace

Brittany Low '10, Women's Studies

ADVISOR: Nancy L. Marshall, Women's Studies

The ballroom dance workplace is a peculiar workplace as gender is intrinsic to the definition of ballroom dance. For instance, men "lead," and women "follow." In this presentation, I examine an interview with a current ballroom dance teacher about gender performance in his student-teacher interactions. I discuss how these student-teacher interactions continually reinforce the current gender dynamics not only in the dance studio but also in every other aspect of the ballroom dance industry. Through looking at the teacher's student-teacher interactions with Professional-Amateur (Pro-Am), social, and competitive dance students, it is arguable that gender performance in the American ballroom dance workplace is largely dictated by the American public's

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demand for dance instruction and by the use of traditional gender roles within actual dance performance/competition.

Women in Writing: It's a Man's World (Until Someone Needs Coffee)

Tamzin Mitchell '09, English

ADVISOR: *Nancy L. Marshall, Women's Studies*

What was the last book you read for fun? How about the last magazine you skimmed through? The last overpriced textbook you bought? These things all have a common denominator: the publishing industry. Women are well-represented in the publishing industry, yet underrepresented in positions of power or prestige. Using research from WOST 219 and retroactive analysis of an internship in a small publishing house, I will examine the roles that women play in publishing, from proofreader to publisher.

The Role of Gender in the Bioscience Workplace: The Experience of a Female Intern

Kate Gallagher '11, Women's Studies

ADVISOR: *Nancy L. Marshall, Women's Studies*

Women have made great progress across all fields of science, especially bioscience. However, unemployment statistics and leadership position statistics indicate that gender inequality is still ever present in the bioscience workplace. Yesterday, women faced blatant discrimination due to stereotypes; today, women face subtle discrimination and a glass ceiling. Drawing on my summer internship in a bioscience laboratory, I address the question: Although there is an equal percentage of qualified women and men potential employees for the bioscience workforce, why is there still gender inequality in employment rates and structure of the workplace? At my internship, I experienced first hand the practices that uphold the glass ceiling. However, the company's decision to allow my participation in research displayed that they are open to the idea of allowing women to participate

at an equal level and that their gendered practices may be subconscious.

Ignoring Inequality: Examining Gendered Actions in the Office of a Female Elected Official

Rachel G. Kohl '09, Sociology

ADVISOR: *Nancy L. Marshall, Women's Studies*

Due to the feminist movements of the twentieth century, the modern workplace is now outwardly more open to female advancement than in the recent past. Places of employment in the public service sector specifically have been experiencing a shift in gender representation and employment structures. However, the barrier of the "glass ceiling" for employed women is still a very real phenomenon. Do gendered interactions in offices of female elected officials accurately reflect this structural change that has been occurring in the public sector? At the office of one of relatively few female elected officials in the United States, the observed workplace was progressive in many ways. However, the gendered actions that were visible but not discussed showed that even work environments that are better than most in terms of gender equality still have a need for improvement.

Language and Memory (short talks) Science Center 396

The Role of Gesture in Lexical Retrieval: Does Gesturing Make a Difference?

Sam Grossmith '11, Cognitive and Linguistic Sciences and English, and Rachel Magid '12

ADVISOR: *Jennie Pyers, Psychology*

Whether they are used to facilitate dialogue or to grasp at a particular word, gestures are embedded in most, if not all, linguistic interactions. But does gesturing actually help us retrieve a word? Difficulty with word retrieval can be seen in frustrating experiences called "Tip of the Tongue" (TOT) states. In our previous research, we compared the TOT experiences of participants who were allowed to gesture to those who were prohibited from gesturing.

While we found no overall difference in number of TOTs, we found that once in a TOT state, the gesture-allowed group was more successful at resolving their TOTs. In this follow-up study, we ask whether inhibition of another body part, in this case the neck, can affect the resolution of TOTs. Sixty participants were randomly assigned to a gesture allowed, gesture inhibited, or neck inhibited condition and were asked to name 52 pictures. The findings will speak to the nature of the relationship between gesture and speech. (Research supported by the Office of the Dean of the College.)

Amicizia (Friendship): Analysis of Group Work in an Intermediate Language Class

Caitlin McGraw '09, Spanish

ADVISOR: *Veronica Darer, Spanish*

Group work is an integral part of learning in today's language classrooms. As part of the Education 307 seminar, we conducted a discourse analysis of an intermediate Italian language class studying the topic of Amicizia (Friendship). Our findings demonstrate how group work enhances or hinders language learning. We discovered multiple variables, such as the role of group leaders, the use of native language, and many others, that construct group work dynamics. The findings of the study can be used to inform the process of group work in language classrooms in general, and help guide students in ways to maximize language-learning opportunities during group work.

Mechanisms of Implicit Memory

Amanda Utevsky '09, Psychology

ADVISOR: *Margaret Keane, Psychology*

When was the last time you went to the doctor? What did you have for breakfast this morning? These are the types of information we typically refer to when we describe "memory." It turns out that our memory systems are actually much more complex than we once thought. How does riding a bike get easier with time? Why do we often prefer melodies that are familiar to us? Why do things generally seem easier the second time around? This presentation



3–4:10pm

focuses on this type of memory: implicit memory. By examining whether prior experience is always beneficial, this discussion will focus on the possible mechanisms by which previous experiences can affect our later behavior. (Research supported by the Office of the Dean of the College and the Psychology Department.)

4:30–5:40pm

Economic Issues

What Goes Up Must Come Down (short talks) Science Center 104

Fighting Italian Tax Evasion: The Effect of the “Studi di Settore” on Income Declarations

Elira Kuka '09, Economics
ADVISOR: *Courtney C. Coile, Economics*

Italian tax evasion is one of the highest among developed countries. As noncompliance has negative effects on equality and government revenues, in the 1990s the Italian government attempted to reduce noncompliance by implementing the “Studi di Settore” (SDS). Under the SDS, the Italian government provides small/medium businesses with a tool to estimate gross revenues, according to their field of activity. This estimation becomes a benchmark; if firms declare their revenues to be less than the benchmark, then the probability of audits becomes larger. In my honors thesis, I empirically test the effectiveness of the SDS method. I expect the introduction of the SDS to have led to more substantial changes in declared income among those types of firms that historically have had more tax evasion, such as smaller firms and firms in the Southern region. I test this hypothesis using data from the Italian tax authority.

Do Institutions Create a One-way Street for Foreign Direct Investment?

Sadia Raveendran '09, Economics
ADVISOR: *Malhar Nabar, Economics*

Does a country’s legal framework, its prevailing investment environment, or its corruption levels have an effect on its economic outcomes? This relationship between the quality of a country’s institutions and national economic outcomes is difficult to estimate statistically because of reverse causality and issues related to measurement error. My thesis makes an attempt to overcome this challenge by analyzing the impact of institutions on foreign direct investment in the aftermath of an external growth shock to the economy. The preliminary regression results indicate that the adverse impact of a negative growth shock on FDI is less in a country with good institutions. In the aftermath of a positive growth shock, however, institutions do not play a similar role i.e. they do not increase the flow of FDI. My presentation will outline the identification strategy for growth shocks, the methodology used, and the validity of my results.

Basketball: For Love of the Game or for the Love of Money?

Anna Morris '12
ADVISOR: *Julia Miwa, Chemistry*

The hype surrounding men’s college basketball has increased dramatically in recent years. Star student-athletes are in the spotlight from the start of the season in November until the championship in March, and at the end an elite few are faced with a difficult decision: enter the NBA draft early, or play another year of college ball? Through an original research paper conceived and executed in my WRIT 125 class, I have examined the logical arguments made by both proponents and critics of the decision to enter the draft early, as well as conducted my own statistical analysis drawing on over five years of numerical data. While a definitive answer to the question still cannot be reached, a comparison between the points, rebounds, and assists of the players who

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have left early versus the players who have stayed all four years in college reveals some interesting and perhaps unexpected conclusions.

Literature and the Arts

Sources of Light: Poetry and Music of Home (long performance) Jewett Art Center, Auditorium

Courtney Sato '09, English, Katelyn Ching '09, Music, Olivia Park '09, Political Science and English, Edlyn Yuen '09, Political Science and Classical Studies, Megan Cunniff '11, English, and Magdalena Zebracka '12
ADVISOR: *Dan Chiasson, English*

How is creativity rooted in one’s sense of place, space, and home? How does a poet’s sense of place seep into his or her creative mindset—into word choice, subject matter, recurring images or themes? There are numerous places that have multiple layers of stories and poems waiting to be revealed: places in nature, neighborhoods, and backstreets. Our poems and music tell of places that span from Kyoto to Hawaii to Wellesley. The performance will open and conclude with original music compositions that tie into the theme of home, using Hawaiian, Latin, French, and English. A poetry reading will follow the opening music piece where students will read original poems. Our creative performance combines poetry and music in an attempt to articulate the revered relationship between art and place.

4:30–5:40pm

Synergy and Slam (short performances) Pendleton West 220

Jazz + Strings + Energy = Synergy!

Rakeen Mabud '09, Political Science and Economics, Chindhuri Selvadurai '10, Neuroscience, Camille Doykan '10, Neuroscience, Laura Stearns '12, and Dan Grieneisen '11 (Olin), Engineering: Systems Design
 ADVISOR: Paula Zeitlin, Music
 PIANO ACCOMPANIST: Vanessa Morris

While string instruments are well known for elegant classical compositions and rollicking folk music, we will share the magic of a classical string ensemble veering off from Bach and fiddle traditions to explore the world of improvisation. In this presentation, we invite you to discover the versatility of Synergy, an on-campus jazz string ensemble, through our performance of jazz and rock arrangements.

Uncommon Ragtime: The Xylophone Rags of George Hamilton Green

Nancy Pontius '09, Music
 ADVISOR: Tamar Barzel, Music

Ragtime, America's popular music of the late nineteenth and early twentieth centuries, was influenced by European dance music, the concert band march, and African American spirituals and folk songs. When it emerged in the late 1800s, ragtime was played by string bands to accompany high-spirited social dances. Composers also published original ragtime pieces as sheet music for wider public consumption. Although most such ragtime compositions ("rags") were scored for either solo piano or piano and voice, some were written for other instruments, such as banjo and accordion. One Midwestern composer, George Hamilton Green (1893–1970), wrote rags for xylophone soloist with percussion accompaniment. In this presentation, I will discuss the importance of Green's lively rags and will play examples on xylophone with piano accompaniment.

Political Development

Nation Building (short talks) Pendleton West 212

Identifying Convergences and Building Alliances between Grassroots Social Movements and United Nations Actors

Anisha Gupta '09, Peace and Justice Studies and English
 ADVISOR: Julie Matthaei, Economics

In general, the relationship between social movements and government institutions has been highly polarized and characterized by mutual criticism. I have participated in both extremes; following a year abroad studying radical antiglobalization grassroots movements, I accepted a job working for the U.S. Permanent Representative to the United Nations. This project aims to identify and analyze certain spheres in which the positions of important actors within the UN overlap with movements on the outside. These convergences and the resulting potential for collaboration and social change are identified in comparative case studies of three thematic areas: land rights-based development, global trade policy, and international financial reform. (Research supported by the Office of the Dean of the College.)

Multidimensional Sequencing: A Strategy of Global Economic Inclusion

Kacie Lyn Kocher '09, Political Science and Middle Eastern Studies
 ADVISOR: Joel Krieger, Political Science

Within a world defined by new levels of interconnectedness, dependency, and competition, globalization has fundamentally changed the ways countries economically compete. Strategic sequencing of economic policies is a necessity in creating economic stability and growth, but not the sole requirement. Rather, multidimensional sequencing describes the strategic sequencing of policies within economic, social, and state capacity realms to assure economic stability and growth. This theory, culminat-

ing honors senior thesis research and a summer of fieldwork in India through a CWS-identified internship, is the explicit recognition of the interdependency of the economy on state and social dimensions, as supported by an extensive case study of the economically promising country India. Through understanding the current status within India, it becomes evident that policy sequencing within the political institutions, the social sector, and the market provide the most comprehensive strategy to allow developing states the ability to participate in the global economy.

Housing and Homelessness in Calcutta and Dhaka

Hannah Dale Sholder '09, Peace and Justice Studies and Sociology
 ADVISOR: Victor Kazanjian, Peace and Justice Studies

In my study on housing and homelessness in Calcutta and Dhaka, I analyze the effects of the partition of British India, into the independent nations of India and Pakistan/Bangladesh, on the living conditions of partition refugees in Calcutta, India and Dhaka, Bangladesh. In particular, I focus on the various planning strategies employed by the East Bengali Hindu refugees in Calcutta to gain rights to land and housing after immigrating to India. By assessing the effectiveness of these strategies, I propose recommendations for how the Bihari Muslim refugees in Dhaka (who are still living in refugee camps) can learn from the strategies of the East Bengali Hindus and begin their own process of obtaining rights to land and housing.

4:30–5:40pm

Planning Phase IV

Patsy Bailin '09, International Relations and Political Science

ADVISOR: *Craig Murphy, Political Science*

Post-conflict reconstruction and nation-building have been pushed to the forefront of international discussion since the end of the Cold War. As a great power, the United States is no stranger to these concepts, having initiated both multilateral and unilateral interventions as early as the end of the nineteenth century. Yet America's efforts have met with frequent failure, sometimes even repeating the mistakes of past experiences. Political analysts often fault poor policy implementation or ignorance of the host country's national or historical context for these blunders. However, these theories fail to explain the fundamental source of miscalculations or expose the essential barrier to cohesive and comprehensive nation-building strategy. For this, one must examine the decision-making process of the United States government and the factors that impact its capacity to evaluate options, goals, and past experiences.

Science and Technology

Experiences of a Magnetic Moment: Magnetic Resonance Research at Wellesley (panel) Pendleton West 117

Designing a Surface Coil and Modifying Three-dimensional Imaging Techniques to Enhance Magnetic Resonance Image Quality

Sahr Khan '09, Chemical Physics

ADVISORS: *Nancy H. Kolodny, Chemistry, and Robbie Berg, Physics*

The quality of Magnetic Resonance (MR) images and spectra may be enhanced by the use of surface coils. Surface coils are flat resonators placed in close proximity to the region of interest of an animal/sample within a magnet. MR studies at Wellesley College have previously been done using a whole body resonator instead of surface coils. In order to obtain higher resolution localized images and spectra we have

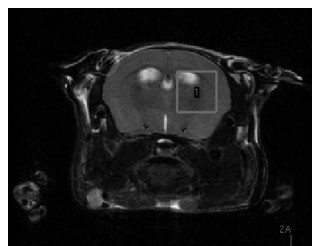
designed and built a new surface coil that resonates at the Larmor frequency of protons in our Bruker Avance (400 MHz, 9.4 Tesla (T), 8.9 cm vertical bore) micro MRI system. We have also optimized parameters of different three-dimensional pulse sequences that can be used to produce fast high-resolution, 3-D images in our ongoing mouse and crayfish studies. (Research supported by a Howard Hughes Medical Institute Research Grant.)

Magnetic Resonance Spectroscopy Study of Neurochemistry of Rett Syndrome in a Mouse Model

Laura Huang '09, Chemistry, and Stephanie Huang '12

ADVISORS: *Nancy H. Kolodny, Chemistry, and Joanne Berger-Sweeney, Biological Sciences and Office of the Dean of the College*

Rett syndrome (RTT) is an X-linked neurodevelopmental disorder that affects 1/10,000 girls, making it the second leading cause of mental retardation in females. The goal of our research is to study the neurochemistry of RTT using the mouse model *Mecp2^{fllox}*. The non-invasive techniques of magnetic resonance imaging and spectroscopy allow us to perform a longitudinal study of the mice between ages three and six weeks. The images obtained are used to localize the region for spectroscopy (image below). Spectra of brain metabolites such as creatine, choline, glutamine, glutamate, taurine, and N-acetylaspartate are then quantified; these neurochemicals are involved in important brain functions. Eventually, this will help us monitor disease progression, identify RTT at an early stage, and investigate the neurochemical effects of potential treatments. (Research supported by Roberta



Dey Staley and Karl A. Staley Fund for Cancer-related Research and Merck/AAAS Undergraduate Science Research Program.)

A New Technique for Visualizing Neural Activity: Activity-induced Manganese Magnetic Resonance Imaging (AIM MRI) in *Cherax Destructor*

Amelia M. Bond '09, Chemistry and French, and Adriane Otopalik '11, Neuroscience

ADVISOR: *Nancy H. Kolodny, Chemistry*

Neurogenesis, the process of generating new neurons, is important in learning and memory. Our lab is interested in using Activity-induced Manganese MRI (AIM MRI) to identify potential sites of neurogenesis in an invertebrate model, a crustacean called *Cherax destructor*. AIM MRI cannot directly visualize the production of new neurons; however, new neurons normally appear in activated regions of the brain. AIM MRI uses the contrast agent manganese, Mn^{2+} , to visualize activated regions of the crustacean's brain. Mn^{2+} travels through the bloodstream and is taken up by tissues through calcium-gated ion channels. When synapses fire, the activity of calcium-gated ion channels increases, which leads to an elevated uptake of Mn^{2+} . The regions with increased Mn^{2+} concentrations produce areas of increased intensity in MRI images. (Research supported by Merck/AAAS Undergraduate Science Research Program and Mentoring in the Sciences Program.)

Using ^{31}P and ^{23}Na NMR Spectroscopy to Investigate the Role of Na^+/H^+ Antiporters in Acid-stressed Cyanobacteria

Jessica L. Tse '09, Biological Chemistry, and Hatice G. Yayla '11, Chemistry

ADVISORS: *Mary M. Allen, Biological Sciences, and Nancy H. Kolodny, Chemistry*

Membrane proteins involved in transporting Na^+ and H^+ ions across the membrane, Na^+/H^+ antiporters, may help regulate the internal and external pH of acid-stressed cyanobacteria. The cyanobacterium *Synechocystis* sp. strain PCC 6803 contains at least five Na^+/H^+ antiporters.



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Studies suggest that these proteins help regulate the internal pH of acid-stressed cells, but how are the internal pH and Na^+ concentration of cells with a 1.5 μm diameter measured? ^{31}P Nuclear Magnetic Resonance (NMR) spectroscopy is used to determine the chemical shift of the pH sensitive inorganic phosphate peak. ^{23}Na NMR spectroscopy using chemical shift reagents is used to detect the relative amounts of Na^+ inside and outside the cells. We are now acid-stressing cyanobacteria at different pHs to follow the transport of Na^+ across the cell membrane. (Research supported by the Merck/AAAS Undergraduate Science Research Program, Howard Hughes Medical Institute Research Grant, and Office of the Dean of the College.)

Human/Computer Interface (short talks) Pendleton East 239

Wii Remote Applications Outside of Competitive Gaming

Chloe Fan '09, Media Arts and Sciences and Psychology
ADVISOR: *Panagiotis T. Metaxas, Computer Science*

The Wii Remote game controller for the Nintendo Wii is primarily known for its motion sensing capabilities and natural gestures recognition that enhance game play beyond traditional joysticks and buttons. From a Human-Computer Interaction research standpoint, the Wii Remote's infrared camera and gesture-based interaction make it an intuitive and innovative device. This project explores the Wii Remote outside of gaming to discover its limits as a tangible user interface. By connecting it to a computer, we can program the Wii Remote to emulate keyboard and mouse input or create gesture-based applications using the Wii Remote as an input. The main focus of this project is the creation of WiiPaint, a collaborative art application that allows up to four people to collaboratively create digital artwork. (Research supported by the Office of the Dean of the College.)

Leaping off the Screen: Connecting Computer Programs to the World Around Us

Alexandra Olivier '11, Computer Science
ADVISOR: *Robbie Berg, Physics*

Quickly replacing the television screen, today's children spend hours staring at computer monitors, while imaginative and constructive play is all but forgotten. Scratch, an easy-to-use programming language, provides a means for kids to design and implement their own projects, teaching creative problem solving skills in the process. As children actively write programs, the computer becomes a tool for artistic expression rather than a surrogate TV. Used in conjunction with the PicoBoard, this research explored ways of extending Scratch programs to the real world. Using various art supplies and craft materials, several sample projects were created to illustrate the immense possibilities of the PicoBoard. Workshops were also conducted to introduce new Scratch users to programming and building with light, sound, touch, slider, and resistance sensors. (Research supported by the AT&T Mentoring in the Sciences Program.)

Improving Usability and Extending Functionality of Security-enhanced Linux

Ayla Solomon '09, Computer Science
ADVISOR: *Franklyn Turbak, Computer Science*

As the Internet becomes a more dangerous place and as software becomes increasingly complex, computer security becomes more important. Security Enhanced Linux (SELinux) is an extension to the Linux operating system that provides fine-grained controls for preventing malicious agents from exploiting software vulnerabilities. It can be very effective, but its policy language is extremely low-level, making it difficult to map a high-level idea of a security policy to what needs to be done in SELinux. To address this discrepancy, I am building a language on top of SELinux to implement administrative role-based access control (ARBAC), an intuitive and

flexible security paradigm well suited for user confinement. This language will better express high-level security policies and help prevent Linux security vulnerabilities from becoming exploits.

Evaluating the Role of Syntax for Novice Programmers: Is Drag and Drop Really a Drag?

Ariel Hathaway '09, Media Arts and Sciences
ADVISOR: *Sohie M. Lee, Computer Science*

Novice programmers are often initially frustrated with the strict syntax of computer programming languages. Recently, in an effort to ignite interest in computer programming and eliminate some of the difficulties that novice programmers may face, computer-based learning environments have been developed, which eliminate the need for the user to learn the syntax associated with a programming language. These applications allow users to drag and drop code segments, thus enabling them to learn the logic and problem-solving fundamentals of programming, without the risk of producing incorrect code. Despite the increasing popularity of such environments in computer science classrooms, the question remains—are these methods efficient for teaching programming, or do they simply prolong the inevitable of learning proper programming syntax? (Research supported by the Office of the Dean of the College.)

Webs, Waves, and Weevils: Signs of Disaster (short talks) Pendleton East 339

Negative Effects of Atmospheric Mercury Pollution Not Detected in Remote Populations of Web-building Spiders

Kate E. Wyman '09, Biological Sciences
ADVISOR: *Nicholas Rodenhouse, Biological Sciences*

Mercury, a neurotoxin, is accumulating in remote terrestrial ecosystems throughout northeastern North America. Orb-weaving spiders (family Araneidae), high-level invertebrate consumers, are excellent

4:30–5:40pm

Social Analysis

Youth, Activism, and Campaigning
(short talks) Science Center 277**Gandhi for President: Philosophy of Nonviolence as Realized in Barack Obama's Presidential Campaign***Shan Shan Tam '10, Philosophy and Architecture*ADVISOR: *T. James Kodera, Religion*

Did President Barack Obama win the 2008 presidential election because John McCain was too old? Was it because Hillary Clinton came across as being smug and presumptuous? Obama's success has been attributed to various factors, including our current economic crisis, the numerous grassroots efforts, and the unpopular presidency of George W. Bush. Many simply believe he ran an overall better campaign. In studying Mahatma Gandhi's teachings, it seemed evident that the main principle grounding all of Obama's strategies is Gandhi's philosophy of nonviolence. Not only can the effectiveness of nonviolence be realized in Obama's successful campaign, the inefficacy of ideological and verbal violence can be observed in the campaigns of Senators Hillary Clinton and John McCain.

Television vs. YouTube.com Ads in the 2008 Election: Does Medium Make a Difference in Negativity?*Lauren Hume '09, Political Science*ADVISOR: *Marion Just, Political Science*

The interactive medium of the Internet, specifically through Web sites such as YouTube.com, provides presidential candidates with innovative ways to advertise. The 2008 presidential campaign was the first during which YouTube existed, and both major party candidates took advantage of this new advertising tool. Both candidates not only posted their television ads there, but they also produced ads that were just distributed online. This project seeks to determine whether Internet ads differ significantly from their TV counter-

subjects for studying the impact of sub-lethal levels of mercury on forest animals because their webs provide "snapshots" of their behavior and neurological function. Spiders of the diadematus group of the genus *Araneus* were collected from the Jeffers Brook watershed in the White Mountain National Forest, New Hampshire, and analyzed for total mercury content. Webs were photographed and measured to test for correlations between body burden of mercury and web features. No relationships were detected between total mercury content and web structure. Additionally, one individual with a uniquely high total mercury concentration demonstrated a typical web structure. Spiders in the study area appear to be largely unaffected by mercury pollution. (Research supported by the Georgeanne Miller Mulhern Summer Research Fund in the Sciences and the Northern States Research Cooperative.)

Invasion Success and Genetic Diversity in Populations of Introduced and Endemic Weevils in the Galápagos Archipelago*Maryska Kaczmarek '09, Biological Sciences and French, Hoi-Fei Mok '10, Biological Chemistry, and Austin Stuckert '10, Biological Sciences*
ADVISOR: *Andrea Sequeira, Biological Sciences*

Unlike other archipelagos, Galápagos retains most of its original species, but ecological degradation is proceeding rapidly. Introduced species are a threat to its biological diversity. This research investigates processes that can cause introduced populations to evolve rapidly, aiding their establishment and impact on endemic species. Microsatellite DNA loci are regions of nucleotide repeats in the genome and they have become the tool of choice for conservation genetic studies given that they cover multiple genomic regions and they are highly variable. This multi-locus approach will be used to assess the invasive potential of introduced weevil populations specifically by detecting signatures of demographic

growth. Genotyping of multiple individuals will measure potentially adaptive variation among introduced and endemic populations. The results of these investigations could inform the design of measures to curb the spread of the introduced weevil into native habitats. With concerted conservation efforts most of Galápagos' unique biodiversity can be restored.

Sedimentological Analyses of Pocket Beaches, Vieques, Puerto Rico*Cyndhia Ramatchandirane '11, Geosciences, and Asha Stenquist '09, Geosciences and Economics*ADVISOR: *Britt Argow, Geosciences*

The northern shore of the island of Vieques, Puerto Rico, is interrupted by the mile-long Rompeolas Pier. Built in the 1940s, the pier creates a large wave shadow and significantly disrupts long-shore transport. Shoreline position and variation in composition, grain size, and beach profiles are compared along-shore. Results indicate deposition on the up-drift beach and erosion on the down-drift beach, as well as relative fining and coarsening, respectively. Compositional variation between beaches is related to transport and source parameters for the beach system. Winnowing of fines from the down-drift beach due to the pier's wave shadow combined with the physical interruption of long-shore transport are responsible for the modern shoreline morphology and beach composition. Understanding and quantifying both natural processes and anthropogenic effects on tropical island shorelines is increasingly important in light of projected increases in the rate of sea-level rise. (Research supported by the Early Sophomore Research, Wellesley College.)

4:30–5:40pm

parts or are just more of the same. This subject is very important because Internet ads will likely play a larger role in coming campaigns, and if this new medium is especially negative, it may alienate voters and fail to realize its potential as a democratizing force in elections.

Youth Political Participation: The Motivations and Organizing Techniques That Engaged Youth during the 2008 Presidential Campaign

Jane Booth-Tobin '09, Political Science and French

ADVISOR: *Hahrie Han, Political Science*

Young people are traditionally apathetic when it comes to politics and voting. However, young voters turned out in higher numbers than ever before for the 2008 election, supporting Barack Obama by a margin of two to one. They worked for Obama throughout the campaign in seemingly endless ways, from joining his Facebook group to campaigning full-time. Given that political parties and nonpartisan groups have unsuccessfully courted the youth vote for years, how has Obama succeeded where so many have failed? This paper draws on original survey data of Obama supporters under the age of 30 to examine young people's motivations for participation, and the effectiveness of numerous organizing tactics used by the Obama campaign. The conclusions present not only an understanding of the Obama campaign, but also have implications for our understanding of what it takes to increase political participation among young people. (Research supported by a Schiff Fellowship.)

Secrecy, Sensitivity, and Fear (short talks) Pendleton East 139

Distinguishing Sensory Sensitivity from Sensory Discomfort

Michelle Bourgeois '09, Psychology

ADVISOR: *Jonathan M. Cheek, Psychology*

In 1996, Elaine Aron conceptualized the trait of high sensory-processing sensitivity in her book, *The Highly Sensitive Person*.

Although Aron and Aron (1997) claim that their 27-item Highly Sensitive Person Scale (HSPS) measures a single psychological construct, three psychometric studies have concluded that the HSPS is not unidimensional. After weeding out items that conceptually fit with established scales of openness to experience, conscientiousness, shyness, and a "rich inner life," a single-factor 19-item HSPS remained. However, the reduced scale did not appear to adequately make a distinction between what Evans and Rothbart (2008) call cognitive awareness and emotional distress thresholds. A study of 105 Wellesley College students investigated the extent to which the HSPS makes a distinction between these thresholds, or a distinction between sensory-processing sensitivity and sensory discomfort. Discussion will focus on these results. (Research supported by the Psychology Department and the Office of the Dean of the College.)

Does Adolescent Fearfulness Predict Authoritarianism in Old Age?

Veronica Cole '09, Psychology

ADVISOR: *Paul Wink, Psychology*

In times of political uncertainty, some individuals cling to convention, resist change, and show antipathy to those unlike them. These individuals exhibit a trait known as Right-Wing Authoritarianism (RWA), which is linked to many forms of intolerance and prejudice. Using longitudinal data spanning from adolescence to late adulthood, we isolated two pathways leading from adolescent personality to authoritarianism in old age. First, RWA in old age was predicted by an absence of wide interests, and a lack of introspectiveness and openness to new experiences in adolescence; this finding has been reported by other researchers. Secondly, we found that, independently of lack of openness to experience, authoritarianism at age 70 was characteristic of individuals who as adolescents were fearful and submissive but simultaneously reported troubled relations with parents. For these individuals, intolerance and prejudice

appear to be the result of displacement of personal hostility onto the outside world.

Culture of Secrecy

Jennifer Pawson '09, Anthropology

ADVISOR: *Gregory Ruf, Anthropology*

By recognizing and analyzing secrets held by individuals and communities, more can be learned about the cultural values such people treasured. From studies of individual secrecy, I will explore the connections between individual deception and familial, community, and organizational concealment. From secret societies to defense contractors, organizations and companies alike also form a bridge between individual and national secrecy. Through researching concealment and deception in American society, I explore how secrets are part of human existence.

Hello, Can You Help Me?

Theresa Lau '10, Women's Studies and Economics

ADVISOR: *Rosanna Hertz, Women's Studies*

Survivors of rape and domestic violence face immense emotional and societal barriers preventing them from speaking out against these atrocities. Being a highly gendered crime, the hegemonic norms create an even more caustic environment for women seeking assistance. As survivors' first point of contact during crisis, effective hotline services are crucial to the decision to work with a particular organization. However, problems occur that can leave callers feeling vulnerable: calls lost in translation, questions left unanswered, survivors turned away because of communication issues. What can be done to ensure that all women calling out for help will be heard?