

ORAL AND/OR POSTER PRESENTATIONS (Alphabetical Order)

Essie Ablavsky, *Sociology*

Dr. Sarah Hernandez, Professor of Sociology

Dr. David Brain, Professor of Sociology

Dr. Emily Fairchild, Professor of Sociology

Plans for After Graduation: This fall I will be attending UMass Amherst to earn my M.S. in Labor Studies at the Labor Center after which I plan to work in the field of labor organizing.

“This is the Value of Our Labor”: The Nonmajority Union Approach in U.S. Manufacturing

This study explores the present-day practice of nonmajority unionism in the United States. Nonmajority labor unions seek to build a union among workers regardless of whether or not they have the 50-percent-plus-one majority necessary to file for a National Labor Relations Board election. Nonmajority unions were common before the passage of national labor legislation in 1935 and have since been revived as a practice by certain unions. This thesis adds to the existing historical and legal literature on nonmajority unions by providing a sociological examination of the nonmajority union approach. I conducted 4 group interviews and 11 individual interviews with workers and union staff from two different nonmajority unions in the manufacturing sector. From these interviews, it became clear that these unions share a number of common characteristics. Nonmajority unions use a similar range of tactics, such as petition campaigns, political action, leadership development and information sharing. More generally, they tend to run issue-based campaigns, reject a members-only approach, claim victories and act like a union. The fates of the two unions in this study demonstrate that context—in terms of local history, culture, and social organization—matters when applying a nonmajority union approach. With this understanding of nonmajority unions, labor leaders are better able to make informed decisions about appropriate strategies of action in union campaigns.

I presented in March at the Southern Sociological Society annual meeting which was held in New Orleans, LA

Noah H. Anderson, *Applied Mathematics / Computational Science*

Dr. Steven Shipman, Professor of Physical Chemistry

Dr. David Mullins, Professor of Mathematics

Dr. Patrick McDonald, Professor of Mathematics

Plans for After Graduation: I will be joining the PhD program in Computational Science, Engineering, and Mathematics at The University of Texas at Austin.

Guerrilla Clusters for Science: The Application of Genetic Algorithms to Spectroscopy

Fitting molecular parameters to microwave spectra is difficult, especially for room temperature spectra, which are very dense. The current method is to manually match peaks and tweak parameters, an extremely time consuming process. Because the forward problem of predicting a spectrum given molecular parameters is much easier, a genetic algorithm is potentially well-suited to automated spectral fitting. A genetic algorithm was developed to fit spectra by optimizing the rotational and distortion parameters of the molecule for the best match between the predicted and observed spectra. The algorithm was tested on a variety of simulated and experimentally observed spectra with some success. The use of

parallel, distributed, and cloud computing to run the genetic algorithm faster also posed some interesting challenges.

Poster at American Chemical Society, Florida Annual Meeting and Exposition, Tampa, 17 May - 20 May 2012.

Delaney Anderson, *Religion*

Dr. Susan Marks, Professor of Religion
Dr. John Newman, Professor of Religion
Dr. Heather White, Professor of Religion

Plans for After Graduation: I will be attending Florida State University to pursue my Masters in Social Work. I hope to work as a Social Worker with students in underserved schools.

What About the Agape?: Understanding the Communal Love-Feast of Early Christianity

While many people know of the Last Supper and Eucharist, not many know of the Agape or “love-feast”, a popular banquet feast in early Christianity. This thesis argues that the Agape existed as another celebratory meal for Christ-followers at this time. The Agape appeared after the celebration of the Last Supper, but before the establishment of the Eucharist at the Council of Nicaea. Through an analysis of primary texts, no relation appears between the Eucharist and the Agape, or a direct connection from the Agape to the Last Supper. Further, this thesis argues that the popularity of the Agape resulted from the development of associations in Christian communities, following the practice of Greco-Roman pagan associations. So, what does the Agape show us? The Agape illustrates the division in early Christianity. During this period, no over-arching church structure existed and the Agape developed as a means of celebrating amongst Christ-followers. The Agape developed from the general duty of Christ-followers to celebrate together. Acknowledging the existence of the Agape allows us to see the ambiguity and division present in Christian communities at this time.

Cheryl Askey, *Psychology*

Dr. Steven Graham, Professor of Psychology
Dr. Heidi Harley, Professor of Psychology
Dr. Michelle Barton, Professor of Psychology

Plans for After Graduation: After graduation, I plan to spend some quality time with my family before searching for a job in the mental health field during my gap year. I will be applying to graduate schools this Fall in hopes of entering a Counseling Ph.D program.

What Are You Looking For? The Associations of Attachment Style and Romantic Relationship Ideals with Attraction

The associations between attachment style and romantic relationship ideals were studied as participants were presented with dating profiles created by potential romantic partners. One hundred and forty-three participants completed questionnaires assessing their attachment style and romantic relationship ideals before viewing four potential partner profiles. Attraction, willingness to date, honesty, and perceived romantic relationship ideals were also assessed based on the profile participants thought was most attractive. Significant correlations were found between the attachment measures and the measures of attraction and willingness to date. Anxiety was positively correlated with attraction toward the preoccupied and fearful partners, and willingness to date the preoccupied partner. Anxiety was

negatively correlated with attraction and willingness to date the dismissive partner. Avoidance was positively correlated with attraction and willingness to date the dismissive partner. These results indicate that attachment anxiety and avoidance are related to how attracted a person is to a potential partner profile. Further research is needed to determine what causes these differences in attraction.

Katrina Bang, *Biology*

Dr. Sandra Gilchrist, Professor of Biology

Dr. Amy Clore, Professor of Biology

Dr. Alfred Beulig, Professor of Biology

Plans for After Graduation: Study for the MCAT, spend time with my family, and work as a laboratory assistant/technician until I get into medical school.

The coelomocytes and inflammation in the sea urchin Lytechinus variegatus (Lamarck, 1816)

Phagocytosis is a first line of host defense in vertebrate and invertebrate immunity. A report that body wall from the earthworm *Lumbricus terrestris* contained an inhibitor of *L. terrestris* phagocyte migration, prompted the question of whether tissues from the sea urchin *Lytechinus variegatus* similarly affected the migration, and consequently, the ability of *L. variegatus* phagocytes to eliminate foreign invaders. Phagocytotic coelomocytes from *L. variegatus* were studied in vitro using light microscopy to gain an understanding of the cells' normal functions and morphologies. Tissues were harvested from the digestive tract, gonads, peristomial gills, and peristomial membranes of *L. variegatus* urchins, and each tissue individually assayed to determine their effect on the phagocytotic coelomocytes. The effect of *L. variegatus* tissues on phagocytes and inflammation was evaluated by analyzing changes in the median number of total phagocytes (TP) and the phagocytosis index (PI) of phagocytes over time. Preliminary observations of the cells in vitro indicate that small phagocytes may initiate and augment the formation of cellular clots within the coelomic fluid via a net-like mechanism. In the presence of yeast in vitro, a significant number of phagocytes were found to migrate into peristomial membrane. Statistical analysis indicated that the presence of yeast may induce an increase in the TP in vivo; significant differences were not found between the PIs from any of the experimental conditions analyzed. These findings suggest that the presence of yeast causes inflammation, and that phagocytes migrate into peristomial membrane following phagocytosis and encapsulation.

Rachel Barnard, *Psychology / Spanish Language and Culture*

Dr. Steven Graham, Professor of Psychology

Dr. Heidi Harley, Professor Psychology

Charla Bennaji, Instructor of Spanish Language & Literature

Plans for After Graduation: I plan to be rich and/or famous after I graduate.

Attitudes About Hispanics and Spanish-English Bilingual Education

The current study sought to examine the relationships between symbolic racism, resistance to change, and attitudes on bilingual education. A 45-item survey consisted of five sections: the Symbolic Racism scale, the Resistance to Change scale, the Attitudes on Bilingual Education scale, prior knowledge of bilingual education, and demographic questions. It was hypothesized that individuals scoring high on the Symbolic Racism scale would also demonstrate more negative attitudes on the Attitudes Toward Bilingual Education scale. It was also hypothesized that individuals scoring high on the

Resistance to Change scale would also show more negative attitudes on the Attitudes on Bilingual Education scale. There was a significant correlation between higher symbolic racism and more opposition to bilingual education; however, there was no significant correlation between resistance to change and opposition to bilingual education. Instead of educating the public on what bilingual education is, researchers should focus on educating the public on how and why bilingual education works, why the programs are so important for the United States, and the effect bilingualism can have on the country and its constituents.

Katelyn Bobek, *Humanities*

Dr. Stephen Miles, Professor of Music
Margaret Eginton, Professor of Acting and Movement
Dr. Robert Zamsky, Professor of English

Plans for After Graduation: Summer job at Farm and Wilderness Camp followed by an internship hopefully in an interdisciplinary performance space.

In Site Out: Placing Emancipatory Practice in Installation and Site Specific Work

"In Site Out" is an installation of site-specific film, structured by a practice of emancipation to facilitate a self-directed encounter by the spectator with the work. The goal of this project was to use personal experiences without creating with those materials a universal sense of meaning. In using costuming barriers to abstract and obstruct the body, as well as the installation of multiple screens, I as a spectacle-maker attempt to destabilize my body, making room within it for the spectator to have their own relationship with my space. In writing about "In Site Out" I drew off works which exhibited a distinct connection to materials in the site and the material of the body. I use my memories of the site as grounding material which ties the work directly to each place. I film this interaction to create an installation. By focusing on the interiority of my site-specific experience, then framing the by-product in an installation, I hope to create a work of identity which is inclusive of the interior and exterior as fluctuating material both seen and unseen by another person. I tried to engage in an experience of the private within the personal. Framing this site-specific work in an installation, I hope to further my exploration of the emancipated practice within the collective: a practice of being together without becoming one.

Claire Comiskey, *International and Area Studies / Economics*

Dr. Sarah Hernandez, Professor of Sociology
Dr. Tarron Khemraj, Professor of Economics
Dr. Barbara Hicks, Professor of Political Science

Plans for After Graduation: After graduation, I plan to work in labor organizing, especially with immigrant populations in the US. In the long term, I would like to pursue graduate study to conduct action research, focusing on the economic sociology of globalization.

Deposits Grow, Disempowerment Lingers: Economic Status and Social Empowerment in a Women's Self-Help Group Microfinance Program in Rajasthan, India

Using a case study from rural Rajasthan, India, this research examines the impact of women's involvement in microfinance self-help groups on their economic status and social empowerment. Microfinance – a financial service, small in size, provided by financial institutions to the poor – has

garnered immense popularity as a strategy to empower and lift out of poverty low-income women in developing countries. However, there is disagreement as to whether microfinance programs achieve these dual aims. Although microfinance garners international acclamation, there has been neither widespread proof of its effectiveness nor many studies of its implementation on the ground. Thus, the knowledge gained from this field research helps inform the model of microfinance programs for women by illuminating what aspects of the self-help group model have and have not been effective in terms of poverty alleviation and women's empowerment. Conclusions from this study are made from content analysis of interviews with twenty-four women participating in microfinance self-help groups and the researcher's observations of how the NGO's approach impacted the program. Findings indicate that the women's participation did not cause them to make more money, but did allow them to accrue savings that they valued. Most women did not experience social empowerment from their participation. An analysis of this program's successes and pitfalls indicates broadly if and how women's microfinance programs can be better designed and implemented.

Midwest Sociological Society - Formal Paper Presenter (March 2012) & Council on Undergraduate Research (CUR) - Posters on the Hill - Poster Presenter (April 2012)

Kelsey Cooke, Psychology

Dr. Michelle Barton, Professor of Psychology

Dr. Steven Graham, Professor of Psychology

Dr. Heidi Harley, Professor of Psychology

Plans for After Graduation: After graduation, I am going to travel around Europe with my mother, and then apply for culinary internships and writing workshops. While I do intend to go to graduate school, baking has become my passion; thus, I can only hope that my future is studded with cupcakes, tarts, and other sweet things.

Crossing the Threshold: An Examination of the Duration of Self-Regulatory Tasks Within the Ego Depletion Paradigm

Self-regulation is the suppression of an idea, emotion, or urge, often in an effort to meet a goal, or to align with social expectations, morals, and values. Self-regulation exertion has been found to result in self-control failure, also known as ego depletion. To test whether the amount of time spent self-regulating affects the occurrence of subsequent self-control failure, the duration of a self-control task was manipulated so that participants self-regulated for either a short period of time (1 min), a long period of time (6.5 min), or not at all. Afterward, self-regulatory ability was measured on the Stroop task. No overall difference was found between groups on Stroop performance. However, there was a significant difference between the short duration and long duration groups on initial Stroop performance. No difference was found in mood between groups. These findings suggest that the duration of a self-control task affects self-control performance, such that longer periods of self-regulation result in worse subsequent self-control. However, it is unclear whether ego depletion occurred because the control group did not differ from the depletion groups. This reinforces the importance of replicating previous findings, and supports the failure of previous studies to report significant effects of ego depletion.

Jonathan Davidson, Economics

Dr. Richard Coe, Professor of Economics
Dr. Patrick Van Horn, Professor of Economics
Dr. Duff Cooper, Professor of Statistics

Plans for After Graduation: I'm headed to the School of Information at University of Michigan, where I'll specialize in information policy in that Masters program.

The Economics of the Hackers' Revolution: How Open Source Challenges Notions of Innovation and Value in the Age of Free

This paper addresses the open source development model of information goods production. Features of its non-proprietary and free nature appear to clash with economic and legal assumptions, so this paper aims to reconcile them by reflecting a paradigmatic shift in intellectual property ownership and use, sparked by the user-innovators called hackers. Contrary to the notion of creating more incentives by restricting intellectual property, rights in a collaborative and modern information goods economy can be overly restrictive and reduce production, leading us to consider alternative ownership styles with software as a public good. As open source communities evolve, altruistic motives give way to other intrinsic motivations such as enjoyment and learning, transforming antagonism towards commercial enterprise into healthy competition of similar-quality products. Not surprisingly, governments show increasing interest in the open source sector, both as an alternative product and a production and innovation model. This paper argues that governments and economists should not reject open source out of hand, for although on its face threatening, open source is an example of creative destruction that commercial firms have adapted to and now contribute to.

Fabienne Elie, Humanities

Dr. Aron Edidin, Professor of Philosophy
Kim Anderson, Professor of Art
Dr. Miriam Wallace, Professor of English

Plans for After Graduation: After graduation I intend to move to Chicago in the hopes of finding an internship or apprenticeship in the field of Industrial Design and developing a portfolio towards a graduate studies program in Industrial Design.

Critical Image: Analyzing Collage as a Form of Critical Visual Discourse on Society

This thesis intends to assess the relative value of collage as a form critical visual discourse. The works of three prolific Collagists active in the mid to later 20th century are analyzed for their relative approaches and their connections to a broad socio-historical context. In doing so, this thesis addresses the ontological significance of the image in communicating meaning, the critical historical relevance of particular imageries and the constructive critical potential for the manipulations of these images as it relates to the structures of art and post 20th century society.

Jeremy Evans, *Neurobiology*

Dr. Alfred Beulig, Professor of Biology
Dr. Leo Demski, Professor of Biology
Dr. Gordon Bauer, Professor of Psychology

Plans for After Graduation: I will be working and traveling for the coming year, hopefully observing medical practices throughout the United States and beyond. After this interim, I will enroll in medical school to prepare for a career in medicine.

Learning under Stress: Separating the Effects of Allopregnanolone and Fluoxetine in Carassius Auratus

This thesis compares the cognitive and affective effects of two anxiolytic compounds in the goldfish, *Carassius auratus*: fluoxetine (Prozac®), an antidepressant, and allopregnanolone, a neurosteroid native to the brain of vertebrates. There is a literature review on the role of the interactions of stress, the endocrine system, and the brain in both goldfish and humans to stage the hypotheses in question, ultimately predicting a decline in cognition in fish exposed to the anxiolytics unless they are also presented with exogenous stress. The results of the scototaxic trials indicate a significant increase in exploratory behavior in only the allopregnanolone group over the control. Cortisol-treated groups exhibited greater initial avoidance behavior, but this effect diminished in latter trials, resulting in significant impairments by the final block. Those fish treated with anxiolytics and cortisol presented a similar pattern, with only allopregnanolone+cortisol demonstrating hippocampal-dependent avoidance behavior on par with the control group by the end of the experiment. Throughout the trials, all fish treated with fluoxetine demonstrated substantial impairments, especially in tests that required the retention of a trace stimulus. In conclusion: it is apparent that fluoxetine impedes temporal cognition in goldfish, even when compensating for hypercortisolemia, and that allopregnanolone is capable of ameliorating the cognitive deficits of chronic stress on the hippocampal homologue in goldfish. Additionally, the acute anxiolytic effects of allopregnanolone are likely conserved in the goldfish.

Ilene Gillispie, *Religion*

Dr. John Newman, Professor of Religion
Dr. Susan Marks, Professor of Religion
Dr. Heather White, Visiting Professor of Religion

Plans for After Graduation: I will spend this summer studying Punjabi language in Chandigarh, India through the State Department's Critical Language Scholarship program. In the fall I will begin my Master's of Divinity at Boston University School of Theology.

Daughters of Waheguru: Examining Politics of Gender in the Global Sikh Religion

This work aims to add to the Western scholarship on the Sikh religion, which I have found valuable but as of yet narrow in scope. It is vital that we raise awareness in the West about who Sikhs are and what they believe if we wish to reduce the amount of violence and prejudice Sikhs face. In this work, I speak particularly to the lives of female practitioners, because I see their situation as unique but also highly reflective of a current trend in religious scholarship—the emergence of feminist theory within and surrounding religious traditions. The information we have surrounding women's involvement in the Sikh tradition is dissonant at best, and undeniably sparse as well. Issues of women's participation in Sikh practice have only recently begun to be explored in scholarship, and thus women's voices are only beginning to be heard. While Sikhism was founded upon profoundly egalitarian principles, there is as of yet a great disparity between the egalitarianism of Sikh scripture and the enactment of these ideals. I

identify three main factors as contributing to this disparity: the patriarchal culture of India, concerns of economy, and the political realm. Additionally, I propose that militarism and extremism have had a profound impact on the field of Sikh studies, both in India and in the West. In writing this work, I relied heavily on Sikh history, scripture, and the testimonies of Sikh women whose interviews I collected as part of my research.

Brittany Gordon, Chemistry

Dr. Steven Shipman, Professor of Physical Chemistry
Dr. Suzanne Sherman, Professor of Chemistry
Dr. Paul Scudder, Professor of Chemistry

Plans for After Graduation: I was accepted to an NSF REU in solid state chemistry at the University of Oregon this summer. After graduation next year, I plan to go to grad school and get my PhD in Chemistry.

Waveguide Chirped-Pulse Fourier Transform Microwave (CP-FTMW) Spectrum of Ethanethiol From 8-26.5 GHz

The microwave spectrum of ethanethiol, a molecule of potential astrochemical interest, was measured at 0°C from 8.7—26.5 GHz with waveguide chirped-pulse Fourier transform microwave spectroscopy (CP-FTMW). To accomplish this, new pulse generation and detection circuits were built to extend the upper frequency limit of the New College spectrometer from 18.3 to 26.5 GHz. The full ethanethiol spectrum contains thousands of peaks above a 3:1 signal-to-noise ratio. The observed spectrum contains contributions from the normal species, ³⁴S, and ¹³C isotopomers of both the trans and gauche isomers of ethanethiol. A description of the new spectrometer circuits and a preliminary analysis of the spectrum are presented.

USF Castle Conference, April 2012 & ACS FAME Conference, May 2012

Cody Gunton, Mathematics

Dr. Patrick McDonald, Professor of Mathematics
Dr. David Mullins, Professor of Mathematics
Dr. Donald Colladay, Professor of Physics

Plans for After Graduation: This Fall I will attend the Mathematics Ph.D. program at University of Arizona. I intend to pursue a career as a researcher in pure mathematics after receiving my Ph.D.

A Bost-Connes System for Q_p

Following the 1995 paper of Bost and Connes, which defined the Bost-Connes system C_Q , we define and study a C^* -dynamical system C_{Qp} related to the class field theory of Q_p . We consider quotients of a pair (Γ, Γ_0) of discrete two-by-two matrix groups and show that there is a map from the corresponding Hecke algebra $A(\Gamma, \Gamma_0)$ to the algebra of unitary operators on $H = \ell^2(\Gamma/\Gamma_0)$. Extending this map to the closure of $A(\Gamma, \Gamma_0)$ in a regular representation on H gives C_{Qp} . A presentation of C_{Qp} in terms of two classes of generators is given, and is used to find a covariant representation of $A(\Gamma, \Gamma_0)$ having partition function equal to the Euler factor of the Riemann zeta function at p . This representation is conjectured to extend to C_{Qp} .

Tania Harrison, *Applied Mathematics*

Dr. Necmettin Yildirim, Professor of Mathematics

Dr. Eirini Poimenidou, Professor of Mathematics

Dr. Patrick McDonald, Professor of Mathematics

Plans for After Graduation: After graduation I plan to return to my regular summer job as a commercial fisherman in Prince William Sound, Alaska. During the winter I plan to travel.

Mathematical Modeling of Pacific Pink Salmon (*Oncorhynchus gorbuscha*) Population Dynamics

Pacific pink salmon (*Oncorhynchus gorbuscha*) are small anadromous fish with a brief life cycle. At age two they reach sexual maturity and return to their natal streams to spawn and then die. As many communities depend on the large volume of pink salmon returning to Prince William Sound, Alaska, it is important to develop pre-season forecasts to estimate the number of salmon returning to spawn. In this thesis we develop a number of deterministic, differential equation models to describe the pink salmon life cycle and to predict the size of the adult population returning each year. The development of the models is sequential. Each new model adds a degree of complexity and improves the accuracy, either in capturing real data or in representation of the biological system. The effects of the spring zooplankton bloom and the prey-switching hypothesis on mortality of juvenile pink salmon have been well documented. Therefore, we incorporate these factors into our forecasting models, significantly improving their predictive capabilities.

Sarah Hernandez, *Psychology*

Dr. Michelle Barton, Professor of Psychology

Dr. Heidi Harley, Professor of Psychology

Dr. Steven Graham, Professor of Psychology

Plans for After Graduation: I will enroll in the Community and Prevention Psychology Ph.D. program at the University of Illinois at Chicago this fall.

I am Us: Overlapping Mental Representations of Self and Community

This study investigated the inclusion of community in the self comparing a school community and a local/city community. Participants were administered a survey with a self descriptive task, community descriptive task, and modified Inclusion of Community in Self Scale. Participants then performed a self descriptive reaction time task. Reaction time responses on traits that matched between the self and community were quicker than on traits that mismatched. Participants were more connected to the school community than the local/city community, and the reaction time effect was significant only in the school community. These findings provide more concrete evidence for the inclusion of community in self scale, and support the use of connectionist models in explaining the overlap of self and community mental representations.

Julie Krzykwa, Marine Biology

Dr. Sandra Gilchrist, Professor of Biology
Dr. Amy Clore, Associate Professor of Biology
Dr. Leo Demski, Professor of Biology

Plans for After Graduation: I will be working as an educator at SoundWaters Coastal Education Center in Stamford, Connecticut, for the summer.

The distribution of Cyphoma gibbosum (the Flamingo Tongue Gastropod) in relation to the presence of the fungal disease Aspergillosis on Gorgonia spp.

The fungal disease Aspergillosis has been an ongoing epizootic in the Caribbean since its identification in 1995. Further investigation into the environmental or biological vectors of Aspergillosis is of great interest, as this disease has had a considerable impact on coral reefs in the Caribbean. A previous study has shown that the gastropod *Cyphoma gibbosum* (Mollusca: Gastropoda: Cypraeoidea: Ovulidae) was able to pass viable spores of *Aspergillus sydowii* (Ascomycota: Eurotiomycetes: Eurotiales: Trichocomaceae), the fungus thought to cause the disease, and previous field studies noted an increased presence of *C. gibbosum* during Aspergillosis outbreaks. These observations suggest that *C. gibbosum* may be a biological vector of Aspergillosis. This study looked at the distribution of *C. gibbosum* in relation to the presence of Aspergillosis on its gorgonian prey along a portion of shallow (<3m) fringing reef off of Los Cayos Cochinos in the Honduran Bay Islands. The disease prevalence of Aspergillosis along the reef was also investigated. Gastropods were not found to feed preferentially on infected, or uninfected fans, but there is circumstantial evidence suggesting a preference for infected fans that indicates the need for further investigation. Gastropods did appear to consume less of infected sea fans, and larger sea fans were observed to be more likely to show signs of an Aspergillosis infection than smaller fans.

The Annual Meeting of the Society of Integrative and Comparative Biology in January 2012

Destiny Sierra Lyals, Psychology

Dr. Steven Graham, Professor of Psychology
Dr. Heidi Harley, Professor of Psychology
Dr. Gabrielle Vail, Professor of Anthropology

Plans for After Graduation: I plan to attend graduate school.

Insight and Perception: The Relationship Between Diversity Attitudes and Perceptions of Campus Diversity

The present study attempted to find a relationship between campus community members' diversity attitudes and their perception of their campus's diversity. One-hundred forty-seven participants, including students, staff, faculty, and administrative personnel from a small, liberal arts college in southwest Florida, completed an online survey that assessed their general diversity attitudes and their perceptions of their campus's diversity. A positive correlational relationship was found between diversity attitudes and campus perception. Upon further analysis this relationship was found to exist between positive diversity attitudes and extreme campus perception. Further research should use a larger population. These findings should be used as the basis for the implementation for diversity programming, recruitment and retention efforts, and creating a more inclusive campus environment.

Christopher Mangels, *Biology / Gender Studies*

Dr. Alfred Beulig, Professor of Biology
Dr. Katherine Walstrom, Professor of Biochemistry
Dr. Christopher Hart, Professor of Bioinformatics

Plans for After Graduation: I plan on taking at least a year off of academic work to narrow down and apply to graduate school in immunology. I will hopefully be doing something in the healthcare field during this time off.

A Transcript Analysis of IL-17 Signaling Related Genes in Response to Respiratory Syncytial Virus Infection in Experimental Elastase/LPS Injured Mouse Lungs

Chronic obstructive pulmonary disease (COPD) affects roughly 80 million people worldwide and accounts for 5-10% of global deaths (Chen, Pociask and McAleer). In 2001 close to three million people died due to complications resulting from the disease (Lopez, Mathers and Ezzati). Furthermore, WHO estimates rank COPD as the 4th leading cause of death in the world (Mathers and Loncar). The prevalence and growing threat to global health caused by COPD has translated into abundant research targeted at understanding the underlying mechanisms that govern the disease process. The surge in research has shown an interesting correlation between elevated levels of the proinflammatory cytokine IL-17, the presence of IL-17 producing cells and progression of the disease. In this study, real time PCR (RT-PCR) is utilized to determine the possible change in IL-17 signaling caused by emphysema-like injury of mice lungs in response to RSV infection.

Nicholas Manting Brewer, *Anthropology*

Dr. Maria Vesperi, Professor of Anthropology
Dr. Gabrielle Vail, Adjunct Professor of Anthropology
Dr. Erin Dean, Professor of Anthropology
and
Dr. Anthony Andrews, Professor of Anthropology

Plans for After Graduation: I will be one of the Vista Volunteer Coordinators on campus starting in the Fall. Eventually, I plan on going to graduate school to earn my PhD in Visual Anthropology.

Constantly Varied/Functional

Digital video has the potential to democratize the field of visual anthropology. The digital medium allows filmmakers to create and transmit their work at a substantial rate. I explore and defend visual anthropology as a subfield, looking to previous literature to examine some concerns that have plagued the field. I reflect on fieldwork at CrossFit Sarasota, a local gym in Sarasota, FL, between September and December 2011 that resulted in my short ethnographic film, *Constantly Varied/Functional*. I separate my method into the three sections of video production: pre-production, production and postproduction. In addition, I describe details that my film was not able to capture, in order to demonstrate the limitations of my ethnographic film. I examine the ethical dilemmas of ethnographic authority and representation. I delineate the editing techniques that I utilized to experiment with reflexivity. Finally, I demonstrate that affordable digital video production is a possibility at a small liberal arts college with little institutional support. While the digital medium brings up new cause for concern, it has allow visual anthropology to become more accessible as a subfield.

I presented my film component at the Planetarium in the South Florida Museum on May 10, 2012.

Christopher Mulholland, Biology

Dr. Christopher Hart, Professor of Bioinformatics
Dr. Katherine Walstrom, Professor of Biochemistry
Dr. Amy Clore, Professor of Biology

Plans for After Graduation: Fulbright to Study DNA Methyltransferase activity in live cells using chromobodies at the Center for Integrated Protein Science in Munich.

Methylation-Dependent Rolling-Circle Amplification: A Novel Method for Detecting DNA Methylation

Epigenetics describes the complex network of covalent and noncovalent modifications to DNA and histone proteins, which act cooperatively to regulate gene expression without changing the Watson-Crick base pairing of the underlying DNA sequence. DNA methylation, the addition of a methyl group to cytosine residues in the DNA sequence, is an epigenetic regulatory mechanism that primarily influences transcription. Aberrant methylation has been discovered in numerous human diseases, giving the study of DNA methylation tremendous biomedical importance.

Currently numerous assays exist for identifying methylation, however no current methods are able to detect methylation at single-nucleotide resolution in situ. This study describes a novel method for detecting site-specific methylation on single DNA molecules. This technique, called methylation-dependent rolling-circle amplification (MD-RCA), uses methyl-sensitive restriction enzymes to discriminate between methylated and unmethylated targets followed by the use of padlock probes, to create circularized templates for replication using Rolling-Circle Amplification. After confirming that methylation-dependent target degradation and rolling-circle amplification of synthetic targets was possible, methylation-dependent rolling-circle amplification was validated in vitro. Results demonstrated that preferential amplification of methylated targets allowed accurate detection of methylated loci. Conformation of this technique in vitro has established that the basic design is functional and ready for development as an in situ single-CpG methylation detection assay.

Sarah O'Connor, Biochemistry

Dr. Katherine Walstrom, Professor of Biochemistry
Dr. Amy Clore, Professor of Biology
Dr. Steven Shipman, Professor of Physical Chemistry

Plans for After Graduation: I will be working for approximately two years in a virology research laboratory at the National Institute of Health as I decide between medical or graduate school.

Examination of RNA Helicase A Function in Small Regulatory RNA Pathways of the Caenorhabditis elegans Germline

The discovery of RNA interference (RNAi) has led to sweeping changes in the current understanding of gene expression regulation. However, many necessary RNAi components, in addition to their functional significance, still remain to be fully elucidated. The continued exploration of RNAi components is critical for greater scientific knowledge and for use of RNAi as a potential therapeutic. ERI-1, an exonuclease, represent a protein necessary for RNAi of the *Caenorhabditis elegans* germline. RNA helicase A (RHA-1) currently presents as a protein with undetermined functions within *C. elegans* RNAi. RHA-1 has been previously linked to control of transcriptional processes within the germline of *C. elegans*. Upon mutation of either ERI-1 or RHA-1, worms present with a temperature sensitive sterility phenotype, thus supporting a possible connection between these proteins.

The work of this thesis examined changes in mRNA transcript expression of 11 genes of *C. elegans*, where genes were either known small RNA targets, germline-enriched, or selected for use as a control. Gene expression changes were observed through the use of quantitative PCR (qPCR). All RNA was purified from and quantified within 4 unique worm strains: wild-type N2, *eri-1* mutants, *rha-1* mutants and *eri-1;rha-1* mutants. As *ERI-1* is a known component of various germline-specific small regulatory RNA pathways of *C. elegans*, namely the 26G endo-siRNA pathway, *eri-1* mutants were used to probe the possible inclusion of *RHA-1* within these regulatory pathways. Experimental results display modest support of this hypothesis. Emphasis is placed on spermatogenesis-expressed genes F18C5.4, C36H8.1, K08D10.7 and Y54G11.A.6, all which present over expression upon *RHA-1* knockout, in addition to literature supported over expression in *eri-1* mutants. Additionally, experimental results also support a possible role of *RHA-1* in the expression of *C. elegans* transposon Tc1. Here, loss of *RHA-1* results in under expression of Tc1, an occurrence consistent with previous work showing that *rha-1* mutations can suppress Tc1 excision. Therefore, *RHA-1* could hold a currently unknown function in the expression of Tc1.

Alison Parks, *International and Area Studies / French Language and Literature*

Dr. Jocelyn Van Tuyl, Professor of French Language & Literature

Dr. Barbara Hicks, Professor of Political Science

Dr. Amy Reid, Professor of French Language & Literature
and

Dr. Aijun Zhu, Professor of Chinese Language & Culture

Plans for After Graduation: This summer I will be working as a teaching assistant for Duke University TIP. My plans for the fall are not yet concrete, but I plan to spend the year abroad in either France or China before continuing my studies at the graduate level.

Vive la pensée-maotsétoung: French Intellectual Maoists and their Readings of China's Cultural Revolution

In 1966, Mao Zedong initiated the decade-long Great Proletarian Cultural Revolution. Mao's final campaign tore through China, leaving devastation in its wake as he worked to spread Communist ideology and consolidate his power. Meanwhile, in France, mounting political and social tensions led to the eruption of street riots led by university students in May 1968. It was around this time that a fringe group of university students, frustrated with the situation in their own country, looked outward for inspiration and found Maoism. Their blind yet faithful identification with Maoism and the Cultural Revolution's Red Guards creates the basis for a meaningful comparison between the Chinese Cultural Revolution and the events of May 1968, which the first chapter of this thesis explores. Several years later, *Tel Quel*, an influential intellectual review, praised Maoism as the new in-vogue political ideology, and in 1974 the publication's main contributors traveled to China. The second chapter of this thesis analyzes the group's writings on China from before and after the trip and reveals the dangers of adopting an ideology outside of its intended context. This thesis examines a brief but significant moment in France's historical relations with China and sheds light on perceptions of Maoism and the Cultural Revolution in the Western imagination.

Hannah Rivers, *Applied Mathematics / Computer Science*

Dr. Patrick McDonald, Professor of Mathematics
Dr. Karsten Henckell, Professor of Mathematics
Dr. Necmettin Yildirim, Professor of Mathematics

Plans for After Graduation: I've accepted a position at Star2Star Communications in Bradenton as a Software Engineer. Eventually I plan to move to San Francisco and work for Google.

Identification of Melanoma using Computer Vision and an Artificial Neural Network

Melanoma is an increasingly common and very serious form of cancer, claiming almost fifty thousand lives annually. The single most important factor in successful treatment of melanoma is early detection.

In this thesis, an artificial neural network designed to distinguish melanoma from dysplastic nevi was created and trained. Heuristics employed by dermatologists to diagnose melanoma were synthesized into a preprocessing method that extracts relevant features, transforming an image into a feature vector. These vectors were then passed to the artificial neural network so it could learn patterns in the data.

The artificial neural network was trained on an amalgamation of images from two publicly available data sets consisting of images of 101 melanoma and 129 benign melanocytic lesions. Because the performance of artificial neural networks is stochastic, results were averaged over a variety of parameter and starting values. On average, the network is capable of distinguishing between the lesions with 64% accuracy, with 53% sensitivity and 73% specificity. At best, its accuracy is 78%, with 86% sensitivity and 68% specificity.

Steven Rizzo, *English / Philosophy*

Dr. Robert Zamsky, Professor of English
Dr. Aron Edidin, Professor of Philosophy
Dr. Miriam Wallace, Professor of English

Plans for After Graduation: I plan on starting my own small press for publishing multi-generic writing and exploring both historical and emerging technologies in printing, binding, and distribution.

Dissyntheграtions: Modernist Canons, Technopoetics, and the Recovery of Abraham Lincoln Gillespie

Since his death in 1950, the experimental poet Abraham Lincoln Gillespie has largely been left out of literary-critical histories of American modernism. Along with artists like Gertrude Stein and James Joyce, Gillespie was intimately connected to the artists, publications, and innovative aesthetic of the Parisian expatriate scene of the late 1920s and early '30s. Yet his work stands out among even the more experimental products of the expatriate communities in the interwar years: his heavy use of neologisms, idiosyncratic punctuation, peculiar graphic elements, and non-normative syntax make assimilation of his work into the received pictures of modernism difficult and problematic. Accordingly, historicizing Gillespie stands in need of confronting this paradoxical and simultaneous distance from and proximity to the received notions of what constitutes American modernism. But what little scholarship on Gillespie has been executed seems content with explaining his difference and absence from historical narratives of modernism by relegating him to the status of “minor” or “marginal.” In this sense, the case of Gillespie is particularly representative of deeper, more fundamental habits of criticism and canon-formation actively complicit in shaping our conceptions of the past. In arguing for a serious reevaluation of Gillespie’s status and particular value as a poet, my project works to unmask these habits and show how they maintain received notions of what constitutes the “canonicity” of some works while suppressing or forgetting other works which do not conform to the narrow set of “canonical” values. I find such habits implicit in the

critical use of modernist memoirs from the interwar years, in critical discussions of the native context for Gillespie's writing, and in Gillespie's historical relationship to the avant-gardes of the later twentieth century. In each case, my consideration points to alternative ways of considering Gillespie and his relation to modernist artistic production, the importance of historiography as a institutional means for intervention against the habits and structures of canon-making and -enforcing, and to Gillespie's misunderstood engagements with technology and academic institutions.

Daniela Rizzo, *Humanities (Russian and German Literature)*

Dr. Alina Wyman, Professor of Russian Language & Literature
Dr. Wendy Sutherland, Professor of German Language & Literature
Dr. Miriam Wallace, Professor of English

Plans for After Graduation: Volunteering with the Southern Poverty Law Center and applying for a Fulbright.

Schillerian Idealism in "The Robbers" and "Crime and Punishment", and The Role of Female Characters as Carriers of True Moral Value

Dostoevsky and Schiller produced works which reflected not only national identity but also the political and social climate of their time. The relationship between these two writers is crucial in understanding some of Dostoevsky's most celebrated works. Schiller's idealistic heroes paved the way for Dostoevsky to expose and rework their intricate, but problematic moral fabric. The female characters in Schiller's "The Robbers" and Dostoevsky's "Crime and Punishment" embody sacrifice, Christian love, and a strong sense of morality that is rationalized and lacking in the male characters. Without the presence of these women the male protagonists could never reach "redemption".

The comparison of these two works allows for a deeper understanding of Dostoevsky's critiques of Schiller's proto-Nihilistic ideas of a morality based on logic rather than religion.

Although these works belong in two different genres, Vyacheslav Ivanov suggests that Dostoevsky's works can be viewed as tragedies with a goal of catharsis. Schiller's "The Robbers" and Dostoevsky's "Crime and Punishment" follow this model, helping to bridge a comparison between play and novel.

Alexis Santos, *Anthropology*

Dr. Uzi Baram, Professor of Anthropology
Dr. Tony Andrews, Professor of Anthropology
Dr. Maria Vesperi, Professor of Anthropology

Plans for After Graduation: This summer, I'll begin working with online technology news publication Engadget.com as a freelancer.

Creating an Interactive Past: Digital Technologies for Public Representation of Archaeological Sites and Artifacts

Archaeological sites are met with a wide array of constraints ranging from limiting budgets to a lack of standing structures that pose unique challenges when creating representations of the sites and artifacts for the public. This thesis notes that archaeologists have not widely embraced digital technologies for the representation of archaeological sites and artifacts, posits that digital technologies enable archaeologists to excel within financial and material constraints, and argues for an expanded use of

digital technologies in archaeological representations. Specifically, this thesis focuses on how three digital technologies – augmented reality, video mapping and online repositories – can enable the public to develop compelling, lasting, and meaningful connections to archaeological sites and artifacts. A chapter is dedicated to each technology and includes an explanation of the technology, examples of how it is currently being used for archaeological representation, and an original case study developed to test and demonstrate its significance for archaeology.

University of Massachusetts Amherst's High-Tech Heritage Conference

Alyssa Sonchaiwanich, *Biology*

Dr. Amy Clore, Professor of Biology

Dr. Elzie McCord, Professor of Biology

Dr. Alfred Beulig, Professor of Biology

Plans for After Graduation: Finish up my requirements for PA school and then apply to PA school.

Using Oligonucleotide Probes for In Situ Hybridization in Developing CML322 Maize Endosperm

This thesis research was a part of a larger research effort funded by the National Science Foundation to study the regulation of early endosperm development in *Zea mays* L. As part of the larger study, a group of inbred lines generated around the world are being studied to look for variations in development as compared to the standard reference line, B73. A second major goal of the grant is to identify key regulator genes and their patterns of localization. Preliminary visualization of sections of the line CML322 seemed to indicate precocious kernel (including of the endosperm) development. Digital imaging and morphometry were undertaken for this thesis to systematically test this hypothesis. We confirmed that the CML322 endosperm does grow precociously under greenhouse conditions in Florida.

The CML322 line was then used to test the efficacy of a new generation of hyper-labeled oligonucleotide probes for in situ hybridization. Specifically, a probe complementary to the transcript encoding the 27 kilodalton (kDa) gamma zein storage protein was employed as a test case for determining the conditions needed to assess the expression patterns of genes currently being identified by the larger project. Results showed that these probes are useful for probing transcripts located in maize tissue and may be used in the future to assess the expression of target genes such as marker genes and transcription factors within maize tissue. Unfortunately, this particular type of oligonucleotide probe has now become unavailable; however, if/when it does become available again (as the vendor says it will), the optimal conditions for this tissue have been determined and can be modified as needed for each probe. Even if other types of probes, such as complimentary RNA probes, need to be used, some of the conditions identified here remain useful.

Rachel Tohn, *Philosophy/Classics*

Dr. Aron Edidin, Professor of Philosophy
Dr. Carl Shaw, Professor of Greek Language and Literature
Dr. Douglas Langston, Professor of Philosophy and Religion

Plans for After Graduation: After graduation, I will be moving up to St. Petersburg. I plan to take some time to introduce myself to the workforce and better discover some of my long-term aspirations.

Recognition in Relational Autonomy

In this thesis, I develop an understanding of relational autonomy that explores in greater detail the ways in which recognition of an individual by others can affect that individual's autonomous agency. In addition to the necessary internal capacities for autonomy developed by relational autonomy's predecessors, and the necessary external conditions that relational autonomy puts forth, I argue that the inner mental states and attitudes of the people involved in any given situation play an equally important role in determining an individual's autonomy. In presenting this perspective, I offer a new way to look at autonomy – not as a strictly defined attribute that is either present or not, but as a fluid way of being that coherently and non-contradictorily adjusts and changes as an individual's social situation and position adjusts and changes. We see that there are ways to live autonomously even in exceptionally rigid social structures, given the proper circumstances and the proper mindsets. I do not offer a comprehensive evaluation of how contemporary understandings of autonomy ought to be structured, but instead present a foundational work that will hopefully spawn greater discussion and inquiry.

Elizabeth Ann Usherwood, *Anthropology*

Dr. Uzi Baram, Professor of Anthropology
Dr. Tony Andrews, Professor of Anthropology
Dr. Erin Dean, Professor of Anthropology

A Giant's Strength: A Multisited Spatial Biography in 19th Century Florida

This thesis argues for a new methodological approach in historical archaeology: a multisited spatial biography of an individual which traces the life of an individual through time and space. Through the case study of Luis Fatio Pacheco, a 19th century African American man, this thesis illustrates how methodology can contribute to a vindicationist approach of African Diaspora archaeology through an individual's life. By looking at Luis Fatio Pacheco's homespaces, or the places he would have considered home, additionally complexity is illuminated in the historical record. This methodology helps connect his life experiences to the larger collective memory of "African America." A multisited spatial biography alludes to the dynamic movement of the past by eliminating site boundaries through a landscape approach and exploring multiple places connected through an individual's experiences.

Michael Waas, Anthropology

Dr. Uzi Baram, Professor of Anthropology
Dr. Anthony Andrews, Professor of Anthropology
Dr. Elzie Mccord, Professor of Biology

Plans for After Graduation: I plan to take a gap year in Israel, working for the Israel Antiquities Authority. After that year, I plan to apply to graduate school to study historical archaeology.

The Enduring Landscape: The Archaeology of Seminole Ethnogenesis in West-Central Florida

The Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, and the Independent Traditional Seminole Nation of Florida are the descendants of the people who were not sent to the Indian Territory along the Gulf Coast route of the Trail of Tears. The origins of the Unconquered Seminoles are contested with popular, scholarly, and indigenous understandings offering differing perspectives. As a result of the confusions created by the colonial encounter in the American Southeast, the historical record has impacted earlier understandings of the origins of the Seminoles. This thesis contributes to uncovering its 19th-century history by focusing on the West-Central Florida landscape, specifically the Myakka River, the Peace River, and Charlotte Harbor. By examining the historic maps of Florida, the historical record, and the archaeological record, this thesis argues for the significance of Southwest Florida for the ethnogenesis of the Seminoles.

I presented my thesis work in January 2012 at the University of Florida Department of Anthropology. The Florida Anthropology Student Association invited me to present on my work.

Hannah Weber, Biochemistry

Dr. Katherine Walstrom, Professor of Biochemistry
Dr. Amy Clore, Professor of Biology
Dr. Paul Scudder, Professor of Chemistry

Plans for After Graduation: I am currently applying to M.D./Ph.D. programs to begin fall 2013 with the intention of becoming a physician-scientist and pursuing a career in cancer immunology research. I have been accepted to do 1-year post-baccalaureate research fellowship at the National Cancer Institute and I will start July 2012.

Myeloid-Derived Suppressor Cell Acquisition of Antigen from Dendritic Cells and Induction of Antigen-Specific T Cell Suppression

Myeloid-derived suppressor cell (MDSC)-induced suppression of tumor-specific T cells in an antigen-specific manner occurs in tumor-bearing mice and cancer patients. The mechanism by which MDSC obtain tumor antigens remains to be identified. We sought to elucidate this mechanism and evaluated our hypothesis that dendritic cells (DC) could provide antigens to peripheral lymphoid organ MDSC. We found that during an overnight co-culture DC previously loaded with ovalbumin (OVA) transferred OVA antigen to splenic MDSC, enabling re-isolated MDSC to suppress IFN-gamma release by OVA antigen-specific (OT-I) T cells in an ELISPOT. Addition of soluble factors derived from solid tumors to the co-culture abrogated the need for splenic MDSC to obtain OVA antigen from DC to suppress OT-I T cells. iNOS expression and arginase I expression and activity by MDSC, associated with nonspecific suppression, increased with the presence of tumor-derived factors. This demonstrates that cytokines and growth factors present at the tumor site convert MDSC from antigen-specific to nonspecific suppressors in a dose-dependent manner. This study also demonstrates the ability of splenic MDSC to obtain antigens from DC, providing a potential mechanism by which peripheral lymphoid organ MDSC

obtain tumor antigens in vivo. We plan to continue this study and determine the mechanism by which DC transfer antigens to MDSC. Most importantly, we plan to validate our findings in tumor-bearing organisms. Elucidating the mechanism of peripheral lymphoid organ MDSC tumor antigen acquisition would aid in developing treatments that eliminate MDSC immunosuppression and promote tumor-specific immunity.

2012 Moffitt Scientific Symposium; Moffitt Cancer Center, Tampa, FL; May 2012.

Allison Whitcomb, *Sociology / Gender Studies*

Dr. Emily Fairchild, Professor of Sociology
Dr. Laura Hirshfield, Professor of Sociology
Dr. Amy Reid, Professor of French Language & Literature

Plans for After Graduation: I will be taking a year off to work at an internship and travel. Afterwards I plan on going to graduate school to obtain my PhD. in Marriage and Family Counseling.

Marketing Masculinity: A Content Analysis of Gender Role Presentations in Super Bowl Commercials at the Turn of the 21st Century

The past century has experienced an abundance of progressive changes regarding gender, leaving us in uncharted territory with new understandings, and presenting a unique opportunity to explore current portrayals in society. An analysis of Super Bowl commercials, some of the largest commercial campaigns in America (Tomkovick, Yelkur, Christians 2001; McAllister 1999), provides a look into gender presentations in American media. Advertisements specifically are arguably one of the most powerful societal influences, reflecting social norms and revealing what is regarded as most desirable. The Super Bowl itself also embodies many aspects of “American” values, based on ideals of hegemonic masculinity with a foundation of aggression, strength, and power. Therefore, in this study I perform a content analysis of Super Bowl commercials from 2000 through 2010 to explore gender role presentations in American media at the turn of the 21st century. I found that Super Bowl commercials serve to perpetuate normative masculinity through images and messages, but also through the use of humor, which serves to police gender roles and reinforce traditional ideas of gender. I discuss the implications of this paradox, in which progressive ideas exist in larger society, though are not reflected in the media.

Presented at the Council of Public Liberal Arts Colleges' regional conference in April 2012.

Allison Wyatt, *Environmental Studies*

Dr. Diana Weber, Visiting Professor of Environmental Studies/Biology
Dr. Heidi Harley, Professor of Psychology
Dr. Suzanne E. Sherman, Professor of Chemistry

Anthropogenic Nutrient Enrichment in Bays and Watersheds: A Comparison of Sarasota Bay, Florida and Kaneohe Bay, Hawaii

I studied two bays that have experienced severe development in their watersheds and continue to be affected by anthropogenic nutrient enrichment: Sarasota Bay in Florida and Kaneohe Bay in Oahu, Hawaii. For my study I conducted a series of water sampling tests on three tributaries of each bay, testing for phosphate, nitrate, and ammonia concentrations. My comparison first involved one within each bay, checking for differences between sites further up in the watershed and further down by the mouth of the

bay. I then compared overall nutrient content between each bay. I found that concentrations of nutrients were generally higher up in the watershed, and Kaneohe showed significantly higher concentrations of nitrates than Sarasota while Sarasota had significantly higher concentrations of phosphates. These differences are likely due to a combination of geological and physical factors unique to each location as well as fertilizer use. Continued studies about how anthropogenic nutrient enrichment is affecting adjacent watersheds, bays, and the ecosystems present there such as seagrasses and coral reefs are necessary in order to protect them and the species that live there.

Jasmine Carolyn Zeki, *Neurobiology*

Dr. Alfred Beulig, Professor of Biology

Dr. Leo Demski, Professor of Biology

Dr. Gordon Bauer, Professor of Psychology

Plans for After Graduation: Taking a year off to work in a medical research lab in my hometown, Chicago IL. Then, hopefully, attending medical school the following year.

A functional and structural analysis of cells in mice visual cortex

My thesis examines new procedures used to study the functional and structural properties in the primary visual cortex (V1) in mice. Chronic window surgery was used to create an opening in the mice skulls that can easily be continually accessed and imaged. Two-Photon microscopy was used to achieve a deeper view into a live mouse than would be available in other forms of microscopy. Intrinsic Imaging functioned to establish the area viewed under the Two-Photon microscope as V1 by showing blood flow. Calcium Imaging was used to show cell activity when a mouse is presented with two different moving bar stimuli which have varying orientations. Cells were found to be tuned or not and then compared to other cells in the same area to examine the effect of proximity of cells on creating functional relationships between them. Single cell electroporation was used to introduce a rabies plasmid to a single cell while keeping it alive. Once a successful electroporation occurred, the cell received an injection of a modified rabies virus. If this step was successful, the pre-synaptic connections to a single post-synaptic cell would be demonstrated.

Overall, the results showed that the procedures used to obtain data were very successful. Intrinsic Imaging showed blood flow orthogonal to each other when presented with two different orientations of moving bars. Calcium Imaging showed changing results from groups of cells that were similarly tuned to areas of cells that were all differently tuned. This raised the question of the effect of the two different moving bar stimuli on the results obtained. Single cell electroporation proved to be a difficult but good method of giving a single cell the plasmid required for later rabies infection. The rabies infection was successful for those cells which were successfully electroporated. Slices of the successfully infected brains were mounted on microscope slides so that pre-synaptic cells could be counted.

In conclusion, the methods used in this study were a successful way of gathering functional and structural data of mice visual cortex separately. The next step is to obtain a way to connect these two sets of data to find a connection between functional and structural data.

I presented a conclusion of my work at the end of the summer for the lab I had been working for in Houston. I worked in Andreas Tolias' Neurobiology Lab at Baylor College of medicine under an alumni, Jacob Reimer.

Dana Ziegler, *Political Science*

Dr. Barbara Hicks, Professor of Political Science
Dr. Duff Cooper, Adjunct Professor of Quantitative Methods
Dr. Emily Fairchild, Professor of Sociology
and
Dr. Keith Fitzgerald, Professor of Political Science

Plans for After Graduation: I received a Fulbright to teach English in Indonesia for nine months.

Follow the Rainbow Brick Road? : A Cross-national Analysis of LGBT Rights

Across the globe, rights for lesbian, gay, bisexual, and trans people (LGBT) are found in varying configurations. This study seeks to understand what factors influence the passage of LGBT rights legislation, and what common characteristics these countries share. Specifically, I look at LGBT rights including decriminalization of homosexuality, equalization of the age of consent for sexual activity, anti-discrimination legislation on the basis of sexual identity, same-sex partnership and marriage, and adoption rights. Through statistical cross-national analysis of global national and sub-national cases, I investigate five hypotheses. The order of legislation is examined to determine if there are standard sequences in the passage of LGBT rights legislation. Neighboring country and regional relationships, differences between predominant religious heritage, and the presence of LGBT advocacy organizations are also explored. I assess demographic and attitudinal variables such as religiosity, society's views on the justifiability of homosexuality, postmaterialism levels, age structure, education, democratic freedoms, and gender equality. Evidence was found in support of all hypotheses, but the outcomes of analyses stress the need for further areas of testing as well as flaws in the current study. The results support a diversity of paths toward broader LGBT rights.

PANEL PRESENTATIONS

Galilee Cemetery - Beauty in a Forgotten Space

Group Project with Dr. Uzi Baram, Professor of Anthropology

Alexis Santos, Elizabeth Ann Usherwood, Michael Waas

The Galilee Cemetery is located on Washington Blvd between Myrtle and Martin Luther King Dr. The Galilee Cemetery, along with the older Oaklands/Woodlawn Cemetery on 10th Way was deeded to the "colored people of Sarasota" during the segregation era. The first burial in Galilee is dated 1935.

Like many community-based cemeteries around the USA, the drop in civic engagements means that fewer people are willing to maintain the graveyards. In Sarasota, the Task Force for the Oaklands/Woodlawn and Galilee Cemeteries cleaned up the cemetery and oversee maintenance. Genealogists surveyed the cemetery in 1992 for the names and dates on all the inscriptions, but historical archaeology offers more tools to document the inscriptions, motifs, spatial arrangements, and map of the cemetery.

This program shows the partnership with New College of Florida Professor Dr. Uzi Baram to document the lives of the interred and the Task Force. In February of 2010, Dr. Baram assembled anthropology students from New College of Florida and State College of Florida to assist members of the Task Force in a project that will systematically record the location of as many graves as possible. This is the first step in a research effort that is expected to add several new chapters to our knowledge of Sarasota's black community.

Media Representation, Coalitions, Internal Decision - Making of Occupy Movements

Indepdent Study Project (ISP) with Dr. Sarah Hernandez, Professor of Sociology

JP Paiva *Sociology / Gender Studies*

Studying Occupy: Media Representation, Coalitions, Internal Decision-Making

This paper examines media treatment of the Occupy Wall Street protests. The authors conducted a content analysis of both print and online news articles from Truthout, Counterpunch, MSNBC, Fox News, CNN, the New York Times, and the Wall Street Journal. Though the findings were limited, largely due to sample size, certain trends still emerged. Attempts to validate or delegitimize the Occupy Wall Street movement tend to compare the movement to other recent large-scale movements. Articles that discuss police action against protesters tend to provide protesters' response to the actions themselves. Articles that discuss protester militancy are less likely to address protest demands, whereas articles that do not discuss protester militancy are more likely to do so. This study lays a groundwork for future research into the field of media interaction with social movements.

Niko Segal-Wright *Sociology*

Speak With Us, Not For Us: Coalition Activity in Occupy Boston

Literature on coalitions in social movements generally focuses on coalition building; how alliances form, what the major barriers are to their formation, and how to overcome them. However, it rarely touches on other fundamental topics, including the meaning and function of coalitions and the outcomes we might expect from them. The Occupy movement presents an excellent opportunity to study these latter topics because of the diversity of alliances formed and outcomes produced. This article examines the effects of alliances developed around Occupy Boston. Results are presented from a series of fifteen interviews with representatives from Occupy Boston and the organizations aligned with it. Previous social movement literature is used to draw conclusions on the prospects that alliances have for benefiting their movement, and ultimately on our definition of 'coalition'.

Tomas Laster *Sociology*

Studying Informal Authority in a Non-Hierarchical Movement

The concept of authority is central to the study of social organization, being of arguably tantamount relevance in both sociological theory and its practical application. The Occupy movement provides a particularly interesting opportunity in the study of authority because it exists as a collection of autonomous non-hierarchical communities which eschew authoritarianism as a form of social organization. This study focuses on the Tampa and Sarasota Occupy movements, two relatively new and small occupations which offer insights into the processes and challenges implicated in maintaining a leaderless, horizontal organization within a diverse and growing movement. By studying the means by which authority is garnered, transferred, and kept in check we may draw conclusions about the nature of authority as well as its function within non-hierarchical organizations

Machine Learning Prediction of Amyloid-Fibril Forming Segments

Class on Bioinformatics Machine Learning Class

with William Murphy, Adjunct Professor of Biology / Computational Science

Dr. Patrick McDonald, Professor of Mathematics

Dr. Katherine Walstrom, Professor of Biochemistry

Dr. Steven Shipman, Professor of Physical Chemistry

Dr. David Mullins, Professor of Mathematics

Dr. Duff Cooper, Adjunct Professor of Quantitative Methods

Amyloid fibril formation is a conformational motif in peptides linked to the incidence of Alzheimer's, Parkinson's, and Huntington's diseases, as well as several cancers of the endocrine system. Recent literature suggests that the propensity for amyloidogenesis is highly localized within a protein. Recent attempts to predict so-called "amyloid fibril-forming segments" have utilized a variety of machine learning algorithms to classify hexamers (peptides consisting of six amino acids) in terms of their amyloidogenicity. We review the current state of the literature on this problem and present our proposed models, methods, and goals in pursuit of a more robust classification scheme.

Timothy Duff, *Mathematics*

My individual work on the problem so far has consisted of modeling aggregation events probabilistically, prototyping software tools for analysis of extant data sets, devising feature encoding strategies, and interpreting the results of algorithms. My current approach is to represent previously classified hexmers via feature vectors, containing information such as aggregate propensities and autocovariance; the latter measurement can be interpreted as a measure of self-similarity of conformational states within the hexmer. Current directions include looking at re-implementing certain algorithms and devising better feature-encoding strategies.

Sonali Gupta, *Biophysics*

Beyond the initial proposal for this project, I worked to identify approaches that accurately classified hexapeptides informed by kinetics and molecular modeling, and devised novel implementations of physico-chemical attributes by isolating motifs in consistently misclassified sequences. By selecting for effective features, such as autocovariance, and against features such as atomic composition and certain kinetics considerations, the algorithm was simplified and resulted in a more potent classifier. In addition, I utilized GAUSSIAN (computational chemistry software) to model archetypes of aggregating and nonaggregating hexapeptides in an effort to quantifiably apprise the construction of scoring functions. My future work will focus on using physico-chemical indices to write partition functions for a probabilistic approach to classifying hexapeptides and to modify the classifier to correctly predict the pathogenicity of a few distinct peptide sequences.

Seth Hearld, *Neurobiology & Computer Science*

My individual work on the problem so far has consisted of writing the necessary code to analyze data with various machine learning techniques via Orange (an open source component-based data mining and machine learning software suite), as well as aiding in the development of the modules to normalize and utilize amino acid properties for feature encoding.

Robert Hincapie, *Biochemistry*

My contribution to the problem thus far has included informing the decision making process by providing a biological basis from which to examine specific characteristics of polypeptides (as they may relate to the problem of amyloidogenicity) and the analysis of results, in particular, those physico-chemical parameters which were the most accurate predictors of fibril-forming segments. In addition, I have performed a set of laboratory experiments in which the aggregation propensity of *Saccharomyces Cerevisiae* alcohol dehydrogenase was qualitatively examined. My future contributions will likely involve the empirical analysis of consistently misclassified hexamers, continued exploration of methods for denaturing fibrils and restoring protein function in vitro, and the analysis of new results and modification of feature vectors, as necessary.

A Predictive miRNA Signature of Glioblastoma Multiforme

Class on Bioinformatics Machine Learning Class

with William Murphy, Adjunct Professor of Biology / Computational Science

Dr. Patrick McDonald, Professor of Mathematics

Dr. Katherine Walstrom, Professor of Biochemistry

Dr. Steven Shipman, Professor of Physical Chemistry

Dr. David Mullins, Professor of Mathematics

Dr. Duff Cooper, Adjunct Professor of Quantitative Methods

David Bacsik, *Biology/Chemistry*, **Brian Robinson**, *Biology*, **Thomas Plate**, *Biochemistry*, **Steven Machusko**, *Chemistry/Biology*, **Tanner Robart**, *Neuroscience/Computational Science*, and **Andrew Schuster**, *Biochemistry*

Glioblastoma multiforme (GBM) is one of the most lethal forms of brain cancer with an average survival of only 14 months. It is also the most common form of brain cancer in adults.

The current method for detecting high-grade gliomas involves the use of different imaging techniques such as Magnetic Resonance Spectroscopy (MRS, aka MRI) to find masses and perfusion variations to detect hemorrhagic activity and angiogenesis associated with the cancer. Tissue obtained via biopsy is often analyzed morphologically after a mass is identified by various types of imaging. The methylation status of promoter regions of known related oncogenes can then be correlated with the type and stage of cancer represented in the tissue.

While these techniques are invariably useful in identifying cancerous brain masses, miRNA profiles have shown promise as markers of cancer origin and as diagnostic tools. Micro RNA (miRNA) are short (21 - 23 nucleotides) single stranded RNA sequences which post-transcriptionally regulate gene expression via gene silencing. Machine learning classifiers using miRNA expression profiles have been found to perform significantly better than chance.

Our preliminary study of miRNA expression in glioblastoma multiforme has identified five miRNAs (MiR-769-5p, hsa-miR-433, hsa-miR-490, hsa-miR-129, hsa-miR-21) with significant predictive power to classify tissue samples as cancerous or not cancerous. Future work will be required to confirm these early findings.