2012 SRS

18th ANNUAL

SUNY NEW PALTZ STUDENT RESEARCH SYMPOSIUM

ABSTRACT BOOK

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SUNY NEW PALTZ
STUDENT RESEARCH SYMPOSIUM

Friday, May 4, 2012
SUB MPR
4:00- 6:30 p.m.

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Sponsored by:
The SUNY New Paltz Research, Scholarship, and Creative Activities Program

Editor and Cover Design:
Maureen Morrow, RSCA Director

The 2012 Student Research Symposium

Once again, as the academic year comes to a close, we have this opportunity for scholarly exchange amongst our faculty and students. The 2012 Student Research Symposium will include 66 poster presentations of work performed by 96 students representing 15 departments. This is an occasion for us to share our accomplishments in a spirit of camaraderie.

The Student Research Symposium is sponsored by the Research, Scholarship and Creative Activities (RSCA) Program. The mission of the RSCA program is to encourage and support student- faculty collaboration in the active participation of scholarly and artistic activities that generate new knowledge or works.

Such activities enable students to gain knowledge, skills, and confidence to contribute as productive members of their professions and contribute to a learning environment which is challenging, student-centered, and personalized.

Acknowledgements

The following people have provided generous support of this event:
Don Hodder (Geological Sciences) for assistance with poster printing;
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Judy DePuy, Risa Honda, and Laura Silvernail (SSE Dean's Office and RSCA) for abstract book preparation and additional support;

Welcome to the Student Research Symposium

Student research participation is one of several "high-impact" educational practices known to produce especially deep and meaningful learning. Such projects require that students devote time and effort to purposeful tasks; make frequent decisions about their work; interact with faculty (and sometimes peers) about their work; and receive frequent feedback about performance. Such experiences deepen understanding of the substance and methodology of a discipline, and provide opportunities to refine and demonstrate problem-solving, analytical, and communication skills. Overcoming the challenges inherent in many successful research projects yields a healthy combination of meaningful confidence and appropriate humility.

Research participation is certainly valuable (indeed, essential) for students considering graduate education and research careers. But these experiences are directly relevant in the education of all students, irrespective of future goals. Recent surveys sought employer opinions about the kinds of experiences they find valuable in producing the knowledge and capability they seek in college-educated new employees. Over 80% value completion of a research or similar project that demonstrates knowledge in the major along with analytical, problem-solving, and communication capability. Over 80% value experiences that help students develop skills to research questions in their field and to develop evidence-based analyses. The capabilities and perspectives gained through research are broadly transferrable, and are in demand both within and outside of academia.

Successful undergraduate research programs like ours depend on the dedication, disciplinary knowledge, and research and scholarly expertise of faculty. I recognize the commitment of time and effort by faculty who have mentored and advised student research and scholarly projects, and I am grateful for your important contributions. I know that in many ways this is a "labor of love," and how rewarding and long-lasting are the intellectual relationships you build with research advisees. I also acknowledge the many important contributions of the advisory committee and campus-wide coordinator (Professor Maureen Morrow) in managing our funding-allocation processes, advising students, organizing events such as this symposium, and many other responsibilities.

Finally, I congratulate students and faculty both for your hard work and your success in projects this past year, and wish you continuing success and fulfillment in the future.

Donald Christian
President

On behalf of the Research, Scholarship, and Creative Activities Advisory Board, I would like to welcome you to the 2010 Student Research Symposium. This event is the 16th consecutive celebration of student-faculty scholarship at SUNY New Paltz.

As you are aware, the process of producing scholarship through research and/or creative activities is both difficult and exciting. I am certain the faculty-student interactions you experienced in this process were unique and stimulating. Please know that these experiences are a rewarding part of the job of a college professor; so do stay in touch after you have graduated. It brings us all great joy and inspiration to hear of your post- New Paltz adventures and successes.

I hope this event brings you fulfillment in presenting the results of your work and inspiration from your fellow students' accomplishments.

Maureen Morrow
RSCA Director and Associate Professor of Biology

Research, Scholarship and Creative Activities Program

Faculty student collaborators may propose projects for support through the Summer Undergraduate Research Experience (SURE) and Academic Year Funds programs (AYURE). Both of these programs are competitive and are selected for support by a faculty committee. Students whose work is accepted for presentation at a professional conference are eligible for the RSCA travel award.

Congratulations to all of this year's award recipients (see pages 49-52).

SURE

The focus of the SURE program is to encourage intensive student participation in an aspect of faculty research. Each student participant is supported with a stipend for the 8 week summer project and is expected to devote at least 35 hours per week to the project. Faculty mentors direct and provide guidance to participating students as they work on a particular aspect of the faculty's research program. As a goal of this program is to encourage ongoing faculty student collaboration, and thus students are encouraged to continue working on the project during subsequent semesters.

ACADEMIC YEAR FUNDS

This program (AYRUE) supports student faculty collaborations on projects that span the disciplines. Projects that generate new knowledge or works are eligible for support. Funds for supplies and support of the research, scholarship or creative activities are provided through this program.

STUDENT CONFERNCE TRAVEL AWARD

The RSCA program supports students to present the results of the collaborative work at professional conferences. Mentors are also supported for travel with the student.

COUNCIL ON UNDERGRADUATE RESEARCH INSTITUTIONAL MEMBERSHIP

CUR provides support for undergraduate research in a variety of way. All faculty, staff, and students are eligible for free membership in CUR. You membership sends a strong message to lawmakers and provides you with access to the CUR Quarterly Publication and monthly enews letters.

Students should consider participating in CUR's Undergraduate Registry. The purpose of this Registry is to facilitate matching between undergraduates and graduate schools seeking high quality students who are well prepared for research. http://www.cur.org/ugreg/register.asp

WE ARE ON FACEBOOK

SUNY New Paltz Undergraduate Research, Scholarship and Creative Activities Group
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For more information, please visit our web page: www.newpaltz.edu/studentresearch.
You may also contact: Maureen Morrow, Director, Undergraduate RSCA morrowm@newpaltz.edu (845-257-3776).

Poster Sessions at-a-glance

Titles for each session are listed alphabetically by first author's last name.
Abstracts can be found in alphabetical order by students department.

Poster Session I 4:15-5:00p

Orthographic Processing in Late Bilinguals
Michael Acerra, Nathan Earl, Elizabeth Sacchi (Psychology)

Optimism, Community Service, and Happiness
Kaitlin Andersen and Jessica Gross (Psychology)

Student Motivation and Course Choices
Ariel Avilla (Psychology)

Narcissism and Reactions to Overqualification
Elena Brondolo, Carrie Sauer (Psychology)

The Why and How of Academics
Samantha Carraro (Psychology)

Understanding Compensation for Coarticulation
Stefanie Catalano, Susan Mason, Josh Dorsi (Psychology, Communication Disorders)

Liquid Enamel Studies on Various Welds
Tanya Crane (Art, Metals)

Toward an Evolutionary Neurocognitive Model of OCD
Daniel Glass (Psychology)

Career Indecision
Jessica Gross, Brienne Schiano, Jason Zanfordino, Alex Wozniak (Psychology)

Situational Specific Emotional States
Amanda Guitar, Daniel Glass, Alexandra Saba (Psychology)

The Big Five and Call Center Preferences
Christian Kuiphoff (Psychology)

Dread and Other Emotions, Motivators and Demotivators
Claire Lichtenberg, Laura Santiago, Andrew Foster (Psychology)

Comparing Perception of Stop-Consonants by Spanish
Sarath Manuel, Alexandria Fontanez (Psychology)

Growing into Love
Kristofer Pistillo (Psychology)

Japanese Papermaking in a Western Kitchen
Molly Purell (Art, Printmaking)

Does Phonology Affect in Letter Identification?

Victoria Schuster (Psychology)

Who Should Counsel LGB Individuals?
Rebecca Shaw (Psychology)

Pop-Up! An Exploration From Narrative to Construct
Keri Sheheen (Art, Printmaking)

Understanding Outfielder Skill
Patrick Sylvester (Psychology)

Olfactory Detection of Female Ovulation
Grant Trouton, Mandy Guitar, Rachael Carmen, Terry Grandis (Psychology)

Shifts in the Treatment of Bipolar Disorder
Carrie Sauer (Sociology)

Poster session II 5:00-5:45 pm

Nocotine Analogues as Insecticidal Agents
Hashim Al-mashat, Kara Heard, Emily Coluccio (Chemistry)

The Repellency of Pinenes Against the House Fly
Jessica Basso, Eric Werner, Jacob Kuruvilla, Kerry Meditz (Biology, Chemistry)

Unraveling Heritage and Native Spanish Speakers
Juan Canales (Linguistics)

Factors Affecting Japanese Stiltgrass Growth
Steven Difalco (Biology)

Analysis of Dad2 Protein
Tsering Dolma, Crystak Okereke (Biology)

Stature Estimation of a Mid-19th Century Community
Matthew D'Agostino (Anthropology)

Proverbs, Processing and Production
Melissa Douville (Anthropology and Linguistics)

Managing Invasives at Sam's Point Preserve
Alicia Fahrner (Biology)

The Transition to Grandparenthood
Kristen Gray (Communication & Media)

The Surface Chemistry of P. putida Using AFM
Sheena Henry (Chemistry)

Sustainable Development in China and Taiwan
Meredith Henshaw (Economics)

Olfactory Response to alpha-pinene in Musca Domestica
Jaydon Kiernan (Biology)

The Second Shift and Fathers
Alicia Loscalzo (Sociology)

Accent Change in Telugu/English Bilinguals
Susan Mason, Catherine Cantone (Communication Disorders)

Environmentalism and Feminism in Miyazakis Films
Zafir Mawla (Sociology)

Vieques Art Project
Teresa Medrano, Mariel Ramirez (Sociology)

Interactions between DNA and a Surfactant
Lucia Milla, Julien Gago-Viel (Biology)

Decreasing Water Quality in Lake Minnewaska, NY
Stephanie Mogil, David Charifson, Krista Munger, Joelle Odin (Biology)

T. arjuna: Exploring Its Fungicidal Potential
Alison Pletch, Laura Hollenbeck (Chemistry)

Reaching the Poorest of the Poor?
Claudia Robles-Garcia (Economics)

Degradation of Anthracene by P. Putida
Ryan Taylor (Chemistry)

Neurosecratory Regulation of Feeding in D. melano.
Eric Werner (Biology)

Melting Studies of DNA Duplexes with a Surfactant
Kathleen Westervelt, Adam Rimawi (Chemistry)

Poster session III 5:45-6:30p

Vinclozolin Disrupts Regeneration in Planaria
Anna Anandan, Heather Gallagher (Biology)

Acylhydrazone Stability by UV-spectroscopy.
Leander Bromley (Chemistry)

Macrocyclic Enantioselective Fluorescence Sensors
Shaun Ben-Ari (Chemistry)

Traffic Congestion Causes and Policy Solutions
Patrick Cook (Economics)

Quantifying Blastema Growth in Planaria
Thomas Donovan (Physics)

Fierce to Farouche: The Hierarchy of Costumes
Kyle Fassett (Theatre Arts)

The Emergence of the Converso and Identity Construction in Late Medieval Spain
Elizabeth Koza (History, Medieval Studies)

Effects of N Compounds on Marine Bacterial Ecology
Erich Markert (Biology)

Analysis of Microbial Communitesin Marine Niches
Jessica Mason (Biology)

Competition in the Video Game Console Industry
Javier Oriol, Gutierrez Barguilla (Economics)

Structure and Properties of Ruthenium (II) Thiocyan
Joshua Paugh (Physics)

Puppet Creation for Second Shepherd's Play
Katherine Patterson (Theatre Arts)

Tamoxifen Rescues G. Tigrina from Xenoestrogens
Corinna Ridgeway, Michael Minicozzi (Biology)

The Economic Experiences of Elizabeth Montagu
Claudia Robles-Garcia (Economics)

Is Paxilline a Ligand for the EstrogenReceptor?
Cody Saraceno, Sarah Benkwitt, Marissa Magerkurth, Nicholas DiPaola (Biology)

Isolation of Estrogen Ligand Binding Domains in GI
Mary Schappert (Biology)

Effects of Cochicine on Planarian Regeneration
Jacqueline Simonson, Thomas Donavan (Biology)

Juvenile Health from Newburgh Burial Ground
Logan Tierney (Anthropology)

Costume Design and Illustrations for Eugenia
Rachel Townsend (Theatre Arts)

Sex Estimation of Skeletal Remains
Amanda Wall (Anthropology)

An Agent-Based Simulation for a Credit Card Market
Haifeng Zhang (Computer Science)

Representing a Rainbow as a Bessel's Function
Laura Zaoutis (Mathematics)

Stature Estimation of a Mid-19th Century Community

Matthew D'Agostino (Anthropology)
Faculty Mentor: Kenneth Nystrom (Anthropology)

The calculation of stature from skeletal remains can provide information on the relative health of an individual and give clues to possible health related problems in a population. In order to calculate stature it is necessary to take measurements of long bones via digital calipers and an osteometric board. In some cases where intact long bones are not vailable, stature can be estimated from fragmentary bones. This project will focus on the stature of African Americans living in Newburgh, New York during the mid 19th century. We will be investigating if the stressors of enslavement, such as malnourishment and intense labor, will over time negatively impact the health of an individual, thus reducing their stature. Although these individuals were not enslaved, it is expected that their stature will be similar to other enslaved groups, indicating the cumulative impact of enslavement.

Proverbs, Processing and Production

Melissa Douville (Anthropology, Linguistics)
Faculty Mentor: Oksana Laleko (Linguistics)

The purpose of this experiment is to study the linguistic phenomenon of code switching, as it relates to the processing and use of idiomatic expressions cross linguistically. Using similar expressions found in both English and French, a cross linguistic comparison of expressions was created for evaluation by English and French bilinguals. Participants represented a continuum of French language proficiency and knowledge of such expressions, with native English monolinguals serving as a control group, native English/French bilinguals falling in the middle of the spectrum and native French/English monolinguals rounding out the end. As predicted, French native speakers generally made the most errors in evaluating the expressions, with lexical transfer from the L1 proving to be most pervasive. These results reflect language organization processes in bilinguals, in regards to idiomatic expressions as they are used as constructions. The results of the native English/French bilinguals on the other hand, provide the most insight into how such expressions function in code switching, as the results revealed that they were likely to be used for expressive purposes.

Juvenile Health from Newburgh Burial Ground

Logan Tierney (Anthropology, Undergraduate)
Faculty Mentor: Kenneth Nystrom (Anthropology)

I am conducting exploratory research regarding the health of the juvenile specimens from the Newburgh Colored Burial Ground (130-1870), a local historic free black cemetery. The current research will evaluate the growth of children as an indicator of the health of the overall population. My work involves evaluating stature from long bones as a proxy for health, and different skeletal pathologies that would indicate compromised health of the juvenile samples who have been previously accounted for in the NCBG. I will compare the results to previous research from skeletal collections of enslaved Africans, in particular from the New York African Burial Ground. The results will provide insight on the transition from slavery to freedom and its impact on health.

Sex Estimation of Skeletal Remains

Amanda Wall (Anthropology, Undergraduate)
Faculty Mentor: Kenneth Nystrom (Anthropology)

Sex determination of skeletal remains allows for more accurate and precise assessment of age, stature, and demography. Thus, the correct estimation of an individual's sex plays an important role in biological and forensic anthropology. This project will utilize metric and non-metric analysis of cranial and post-cranial skeletal remains from the Newburgh Colored Burial Ground (1830-1870), a historic free black cemetery in Newburgh, New York. The project will attempt to use multiple sexing methods on each individual in the collection including discriminant function analysis equations derived for skeletal elements not traditionally used in sex estimations. The purpose of this study is to increase the number of sexed individuals in the Newburgh collection leading to a more detailed understanding of the population. Additionally, the accuracy of their sex determination methods will be considered by comparing the results of multiple methods.

Liquid Enamel Studies on Various Welds

Tanya Crane (Art, Metals, Undergraduate)
Faculty Mentor: Myra Mimlitsch-Gray (Art)

In the realm of domestic utility objects, enamel coated steel is common; however, in the jewelry field, this material is considered to be alternative. In considering the high costs of precious metals for jewelry and hollowware, Professor Mimlitsch-Gray and I proposed to conduct experiments with vitreous liquid enamel over various welds on high carbon steel toward practical, artistic and experimental outcomes. In the past, Professor Mimlitsch-Gray has experimented with these materials and confronted adhesion problems. To address this issue, we tested the compatibility of the liquid enamels on various steel alloys and welded joints. We joined steel with a mini pulse arc welder, a hydro flux welder and the oxy/acetylene torch. We explored enamels ability to join forms through vitreous fusion. With mixed results, we found that the objects form, surface preparation, drying time, kiln temperature and kiln size were all factors in success and failure of adhesion. Through this research, the Metal program will be able to utilize our findings when teaching alternative methods for surface design, and ways to join steel and enamel toward jewelry or hollowware outcomes.

Pop-Up! An Exploration from Narrative to Construct

Keri Sheheen (Art, Printmaking)
Faculty Mentor: Aleanna Luethi-Garrecht (Graphic Design)

For this creative research project, our goal was to create a series of 5 completely illustrated and functional pop-up books. Throughout our investigation, we explored different paper types and weights that would be best suited for each pop-up mechanic. By experimenting with different papers, we learned that some papers are better for folding than others, which is a crucial element in creating movable pieces. We also took into account the difficulty of using basic mechanics in order to create our own pop-up structures, therefore we did a number of paper engineering experiments. Aside from researching different mechanics, we also challenged ourselves with creating a narrative without words. This way, the illustrations, along with the pop-up functions, are what drive the storyline as opposed to text. Collaboration in the design of the entire book was an essential component of this project, which is a necessary skill to have in an artistic career.

Japanese Papermaking in a Western Kitchen

Molly Purcell (Art, Printmaking, Undergraduate)
Faculty Mentor: Jill Parisi (Fine Arts)

This study was an exploration of the traditional Japanese paper making methods. Starting with pant fibers that had been cut and dried I sought to conduct the process that would transform sticks into paper. This process is relatively simple but requires time and physical effort. The fibers which are the dried inside of bark from specific plants are soaked in water over night. The fibers then simmer in water with a small amount of soda ash, a caustic alkaline, for 2 hours. The fibers are cooked when they pull apart both with and against the grain. After being rinsed with water, fibers are picked apart by hand and pieces of bark and imperfections are removed. Fibers are now beat using a hard surface and a large plastic meat tenderizer. Beating separates and softens the fibers so they can form even paper sheets. The beating process is complete when a fiber placed in a jar of water and shaken separates on its own. Paper can now be formed by mixing a large amount of water with 3 cups of beaten fibers in a tub big enough to
accommodate the paper mould. Sheets of paper are pulled, squished onto felts,
and then have to water squeezed out of them in a hydraulic press. Damp sheets
are placed in a drying stack that dries and flattens the sheets. After 24 hours in the stack the finished sheets are ready to be removed. This knowledge contributed greatly to my knowledge of making paper by hand and has allowed me to combine thtype of pulp making with other nontradinal methods.

Analysis of Dad2 Protein

Tsering Dolma, Crystak Okereke (Biology)
Faculty Mentor: Jennifer Waldo (Biology)

Analysis of Dad2 protein In this research, we are specifically analyzing the Dad2 protein, which is an essential subunit of the Dam1 Complex. The Dam1 complex protein that was used for this experiment was extracted from a microbe, named *Candida albicans*. Two steps were performed to analyze the Dad2 protein, first was the stabilization of the protein and second step was the formation of the crystallization screens to obtain the structure of the protein. For the stabilization of the Dad2 protein, we treated the protein with different chemicals under different experimental conditions and then observed its melting point. In order to obtain the structure of Dad2, we performed Crystallization experiments which involved exposing concentrated solutions of Dad2 to increasing amounts of precipitating reagents and using a microscope to detect protein crystallization. This step becomes very essential because it will lead us to determine the structure of the protein

Vinclozolin Disrupts Regeneration in Planaria

Anna Anandan, Heather Gallagher (Biology, Undergraduate)
Faculty Mentor: Spencer Mass (Biology)

Planaria are flatworms with an ability not only to replace wounded tissue, but to regenerate entire animals from mere fragments. Previous work in our laboratory has demonstrated that environmental endocrine disruptors (EEDs), such as BPA & 4-octylphenol, disrupt regeneration in planaria. EEDs are chemicals found in the environment that mimic hormones. Most EEDs are industrial pollutants which mimic estrogen (xenoestrogens). These molecules have been shown to act as low affinity E2 receptor agonists in vertebrates and have been associated with a variety of developmental abnormalities in vertebrates and mollusks. In this work we examine the effects of vincolozolin on regeneration in planaria. Vinclozolin is a fungicide and known antiandrogenic endocrine disruptor that was routinely used in agriculture, viticulture and food production until the late 1990s. Regarding estrogen-related activity, it has been found to cause sex-dependent alteration of expression of certain estrogen receptors. It also seems to effect estrogen receptor expression (down regulating) and progesterone synthesis. Recent pilot studies in our lab have shown that vinclozolin disrupts regeneration in *Girardia tigrina*, formerly *Dugesia tigrina*, when exposed to mircromolar doses. At higher doses, vinclozloin appears to induce integument exfoliation.

The Repellency of Pinenes Against the House Fly

Jessica Basso, Eric Werner, Jacob Kuruvilla, Kerry Meditz (Biology, Chemistry, Undergraduate)
Faculty Mentor: Aaron T. Haselton, Preeti Dhar (Biology, Chemistry)

The house fly, *Musca domestica*, is a common nuisance fly that is capable of transmitting pathogens to humans and animals. Using chemoreception, the fly is able to differentiate between potentially acceptable substrates. Upon finding a suitable medium, the fly can transmit pathogens via mechanical transmission, regurgitation, and/or defecation. Many strategies designed to control this insect vector employ repellent compounds that exhibit mammalian toxicity. Insect repellents derived from natural products may be more desirable than currently available synthetic repellents, provided they possess lower toxicity and equivalent repellant properties. We have developed a behavioral bioassay using a Y-tube olfactometer to determine if alpha- pinene (both R and S enantiomers), a plant secondary metabolite, is repellent to the house fly. Oxygenated derivatives of this compound were also examined for repellent properties using the same bioassay apparatus. Individual adult houseflies were introduced into the Y-tube olfactometer and exposed to pinene solution and vehicle control odors. The initial pathway chosen by the fly was recorded. Individuals of the same age were also introduced into a cylindrical contact assay chamber where they were subjected to pinene in its most repellent concentration. Total time spent on either surface (control or repellent) was recorded. Our study revealed that solutions of S and R alpha - pinene repelled adult male and female M. domestica at most concentrations tested.

Factors Affecting Japanese Stiltgrass Growth

Steven Difalco (Biology, Undergraduate)
Faculty Mentor: David Richardson (Biology)

Japanese Stiltgrass (*Microstegium vimineum*) is an invasive plant that is threatening the growth of understory vegetation in many different habitats. This grass spreads rapidly and dominates understory terrestrial communities. The growth of this plant has been seen in many different habitats, ranging from forested wetlands to open fields, but it mostly associated with moist soils that are rich in nutrients. Controlling and containing this plants growth has become a problem since the factors that influence its growth are relatively unknown. I have performed an experiment looking at the effect of soil moisture on total above-ground Japanese Stiltgrass biomass to examine the constraints of water on growth. I have found that Japanese Stiltgrass prefers moist, frequently watered soil and produces little biomass in dry soils. I am also examining the growth of Japanese Stiltgrass with different levels of soil pH, a major limiting factor to many plants growth to examine if above-ground biomass is related to acidic, neutral, or basic soils. This research will help inform local state park managers on how to proactively find habitats that may future habitat for this non-native grass and start the management and reservation of this area.

Managing Invasives at Sam's Point Preserve

Alicia Fahrner (Biology, Undergraduate)
Faculty Mentor: David Richardson (Biology)

The Nature Conservancy of New Paltz helps manage Sam's Point Preserve in the Town of Wawarsing and the Village of Ellenville. The Master Plan for Sam's Point Preserve describes conservation goals for invasives management. During my continuing internship with TNC, my work has centered on developing an invasive species management plan for Sam's Point Preserve. I reviewed previous research on invasive species identified in the preserve. TNC is a non-profit organization, so they have to allocate their financial resources wisely. In order to prioritize non-native species management, I used an Assessment and Ranking Key that was developed by the Invasive Species Control Director for Minnewaska State Park. After inputting twelve species in the key, five were shown to be the most feasible to manage. I then ran these five species through an Invasive Plant Management Decision Analysis Tool that was created by TNC Conservation Biologists, to delineate the type of strategy to be used for each species. The strategies range from eradication, containment or exclusion, and suppression, and they are based on the presence of the species in the project area and state-wide. The next step is to identify populations of the species at Sam's Point Preserve, take GPS points at their locations, and determine the sizes of the populations.

Olfactory Response to a-pinene in Musca domestica

Jaydon Kiernan (Biology)
Faculty Mentor: Aaron Haselton (Biology)

The house fly *Musca domestica* exhibits behavioral aversion toward alpha-pinene odors. To investigate the flys neurophysiological response to this plant-derived repellent molecule, an electroantennogram (EAG) assay was used to record the olfactory response of the antenna to alpha-pinene . The EAG measurement was carried out within an hour of immobilizing the fly in a full-body wax casing. A 35 cc air-stream was directed over the antennae of the fly, and the volatile compounds were introduced into the airstream for various lengths of time at different concentrations. The response profile of the house fly revealed a difference in sensitivity for the volatiles tested. The EAG parameters including the difference in maximum amplitudes, polarity, length of response, and decay of response will be analyzed for quantitative measurements. Ultimately, this EAG assay will be useful in guiding the development of alpha-pinene derivatives with optimized biological activities.

Effects of N Compounds on Marine Bacterial Ecology

Erich Markert (Biology, Graduate)
Faculty Mentor: Jason Valens (Biology)

Previous research performed at this institution has resulted in the identification of at least 95 novel marine bacteria associated with Indonesian coral reefs, and current and ongoing research of aerobic and anaerobic marine bacteria will likely result in more novel marine bacteria being identified. The purpose of this research project is to evaluate the effect that nitrogenous compounds have on marine bacterial ecology. Pilot experiments have been performed to determine the rate at which bacteria are capable of consuming ammonia. Results indicate an initial lag, then exponential decrease in ammonia concentrations suggesting a significant increase in microbial population size and ecological change. To elucidate the potential changes in bacterial population and ecology, a large bolus of ammonia chloride will be introduced into a tank containing Indonesian live rock samples ensuring that available metabolites are not limiting, thereby allowing for a large increase in bacterial population. Daily nitrogen compound levels will be determined, and a minimum of one bacterial genomic sample per day will be obtained while ammonia is detectable - genomic sampling frequency may then be decreased, as the nitrification and denitrification processes tend to be slower than ammonification. Standard procedures will then be applied to amplify DNA samples, and, using gel electrophoresis, each sample will be compared to a known 16S rRNA gene to ensure the DNA extract is bacterial in nature.

Analysis of Microbial Communites in Marine Niches

Jessica Mason (Biology, Undergraduate)
Faculty Mentor: Jason Valens (Biology)

In marine environments, the micro-organisms that populate the microniches are not well understood. Bacteria living in these communities are vital to the nutrient cycles by consuming dissolved organic matter. The purpose of the research is to identify bacteria on and within Indonesian live rock, compare it to a previous sample, evaluate community diversity and identify unknown bacteria. Along with the communities on the surface of live rock, the bacteria that are inside are also a topic of interest. It is hypothesized that there will be a limited amount of diversity but the niches of the interior pores should be more restricted to anaerobic species. Scrapings were taken off various parts of the live rock for genomic extractions. Focusing on the 16S ribosomal gene, the samples were subject to PCR, cloned into a vector, and miniprepped in order to be sequenced to identify the bacteria. Libraries were made and each clone was analyzed for the role they play in the ecosystem. Currently there are 111 samples to yield a representation of what colonizes the live rock. In further research more libraries will be made to get a better understanding of the diversity and community structure of microbes in marine habitats and how they affect the environment.

Interactions between DNA and a Surfactant

Lucia Milla, Julien Gago-Viel (Biology, Undergraduate)
Faculty Mentor: Pamela St. John (Chemistry)

Personalized drug delivery is of high interest due to its potential for providing medical treatments better tailored to the specific needs of an individual; gene therapy is equally important in that it may aid in the cure of untreatable diseases. A reliable method of implementation for each is still under study although the formation of a micelle or other complex/aggregate composed of hydrophilic and hydrophobic regions may allow for the realization of both treatments. Such structures can have electrostatic interactions with the negatively charged backbone of DNA which may aid in its transportation into the cell. The purpose of this project was to understand the interactions between oligonucleotides and the surfactant CTAB (cetyltrimethylammonium bromide). To test the importance of the hydrophobic component, we used TAB (trimethylammonium bromide); a quaternary ammonium salt which lacks the hydrophobic tail of CTAB. UV and fluorescence spectroscopy were used to find evidence for aggregate formation. The former suggested the formation of complexes/aggregates due to an absorbance increase as CTAB was titrated into the solution. Atomic force microscopy was used in an attempt to characterize the morphology of the aggregates. Gel electrophoresis is currently being used to further study these structures.

Decreasing Water Quality in Lake Minnewaska, New York

Stephanie Mogil, David Charifson, Krista Munger, Joelle Odin (Biology, Graduate)
Faculty Mentor: David C. Richardson (Biology)

Lake Minnewaska is one of five sky lakes that run along the Shawangunk Ridge in Ulster County, New York. A fishless ecosystem for nearly one century, Lake Minnewaska developed a unique ecology due to its outstanding clarity. For example, Lake Minnewaska is home to a water moss observed deep in the lake, constituting most of the lakes vegetative biomass. Also, the fishless, acidic lake became a suitable environment in which Two-Lined salamanders (*Eurycea bislineata*) could breed without fear of predation. Small bait fish (Golden Shiner minnow or Notemigonus crysoleucas) have frequently been observed near the shore of Lake Minnewaska since their unintentional introduction in late 2008 or early 2009. In this historically clear water (oligotrophic) lake, several broad scale changes have occurred following the minnows appearance. Between June to September of 2011 water clarity was about 25% of average clarity from the 10-year pre-shiner average. In 2011, high densities of single-celled green algae were found throughout the summer season, uncharacteristic of this oligotrophic lake. The hypothesis is that the N. crysoleucas introduction has affected the lake ecosystem and its unique inhabitants. Historical and current water quality data and fish population estimates are being used to assess the affect of *N. crysoleucas* on the lakes ecosystem; we will work with Minnewaska State Park to determine the potential for fish removal to improve water quality and species survivorship.

Tamoxifen Rescues G. tigrina *from Xenoestrogens*

Corinna Ridgeway, Michael Minicozzi (Biology, Undergraduate)
Faculty Mentor: Spencer Mass (Biology)

Xenoestrogens mimic the activity of estrogen and can act as endocrine disruptors through their binding to estrogen receptors. Prior work in our lab has shown that the xenoestrogens bisphenol A and 4-octylphenol disrupt regeneration in planaria in a dose-dependent manner and are lethal at high doses. The active metabolite of Tamoxifen (4-HT), an anti-cancer drug used in the treatment of breast cancer, is known to bind to the E2 receptor where it acts as an antagonist. We examined the effects of co-administration of 4-HT and BPA on survivability in the planarian *Dugesia tigrina* and observed a significant rescue effect for 4-HT even at doses which were significantly higher than the LC50 for BPA. These results are consistent with our hypothesis that 4-HT and BPA may act through an estrogen receptor-like pathway in the flatworm with binding affinities in the range of those previously published in other organisms.

Neurosecratory Regulation of Feeding in D. Melanog

Eric Werner (Biology, Undergraduate)
Faculty Mentor: Aaron Haselton (Biology)

Many crucial physiological states and events in an animal's life are modulated by endocrine signaling. Hormonal regulation of blood-borne glucose is of chief importance to many organisms in the production of bodily energy and maintenance of homeostasis. Using transgenic techniques, we are investigating the roles of insulin-like peptides (ILP) and adipokinetic hormone (AKH), which have been demonstrated to regulate insect blood glucose levels, in the regulation of sugar-feeding in *Drosophila melanogaster.* Starved AKH- and ILP-knockdown flies were allowed to feed on blue-dyed 0.5 M sucrose solution until their crops filled with solution. Crop volumes were measured for each treatment group using an absorbance microplate reader and data sets were compared using T-test analysis.

Effects of Cochicine on Planarian Regeneration

Jacqueline Simonson, Thomas Donavan (Biology, Undergraduate)
Faculty Mentor: Spencer Mass (Biology)

Regeneration in flatworms involves proliferation of totipotent stem cells called neoblasts. Mitosis can be disrupted with colchicine, which interferes with the microtubule spindle apparatus required for normal anaphase chromatid movements. Colchicine was identified as a potent disruptor of planarian regeneration in the early 20th century. In this work, we re-examine the effects of colchicine on regeneration using modern tools and techniques with the goal of developing a positive control system for toxicological regeneration studies in planaria. We demonstrate that colchicine has profound dose dependent effects on regenerating *Dugesia dorotocephala* and *Dugesia tigrina* resulting in delayed wound healing, retarded blastema growth, and gross morphological changes. These orphological abnormalities were quantified by tracking changes in growth over time. This typically involves comparisons of numerous serial images. Here we present a method for automating image analysis and measuring changes to growth and regeneration using a macro designed for FIJI, a variant of the NIH Image/J software. Regeneration in flatworms involves proliferation of totipotent stem cells called neoblasts. Mitosis can be disrupted with colchicine, which interferes with the microtubule spindle apparatus required for normal anaphase chromatid movements. Colchicine was identified as a potent disruptor of planarian regeneration in the early 20th century. In this work, we re-examine the effects of colchicine.

Isolation of Estrogen Ligand Binding Domains in G I

Mary Schappert (Biology, Undergraduate)
Faculty Mentor: Spencer Mass (Biology)

Previous work in our lab has shown that bisphenol A (BPA, a component in many types of plastic) has toxic effects on several species of planaria and interferes with regeneration at low doses. At high doses, it is lethal. Recent work has shown that the breast cancer drug tamoxifen can significantly lessen the toxic effects of BPA in planaria and in some cases, reduce lethality. This is of interest because BPA has been shown to work with estrogen receptors (ER) and tamoxifen is known to bind to estrogen receptors. This is very suggestive of a role for vertebrate hormone pathways in invertebrate worms. In this work we are looking for ERs and estrogen ligand binding domains (LBD) in *G. tigrina*. We identified candidate estrogen LBD sequences in another planarian, *Schmidtea mediterranea* (a species of planaria with an extensive EST library and a sequenced genome). Candidate sequences for ERs were taken from rodent and human genomes. The isolation, sequencing and characterization of estrogen LBDs or of an estrogen receptor gene in *G. tigrina* will help to further clarify the conservation of these sequences across phyla. In addition this will provide a valuable tool for future work understanding the mechanism behind the effects of xenoestrogens on these organisms.

Is Paxilline a Ligand for the Estrogen Receptor?

Cody Saraceno, Sarah Benkwitt, Marissa Magerkurth, Nicholas DiPaola (Biology, Undergraduate)
Faculty Mentor: Jeff Reinking (Biology)

Paxilline is chemical compound that is naturally produced by the fungus Penicillium paxilli, and is highly toxic to humans. To date, the primary mode of toxicity of paxilline is as an inhibitor of so-called big Potassium (BK) channels. Intriguingly, many BK channel inhibitors, including paxilline, have also been characterized as having the ability to interact with the different isoforms of the human Liver X Receptor (hLXR), which are nuclear transcription factors. Based on a previous study, we have seen preliminary evidence that suggest paxilline may also interact with the human Estrogen Receptor alpha (hERalpha). In this study we will be using differential scanning fluorimetry and limited proteolytic digestion to characterize the interaction of recombinantly produced hERalpha and paxilline.

Nicotine Analogues as Insecticidal Agents

Hashim Al-mashat, Kara Heard, Emily Coluccio (Chemistry, Undergraduate)
Faculty Mentor: Preeti Dhar, Aaron Haselton (Chemistry, Biology)

Nicotine shows strong insecticidal properties, acting as an agonist at the insect nicotinic acetylcholine receptor. Our work involves the investigation of the insecticidal properties of compounds based on the structure of nicotine. The important structural components of nicotine include the aromatic pyridine ring and the aliphatic pyrolidine ring. Our interest is in changing both of these ring types and measuring the insecticidal properties of the intermediates and end products. Because the pyridine ring is deactivated compared to benzene, we will similarly deactivate the ring by adding a chloro group. This group will be added in the ortho, meta, or para position. The starting compound (vinylchlorobenzene) contains a double bond, which will be used as the starting component for generating the azetidine ring of our target compound. In that step, chlorosulfonyl isocyanate (CSI) reacts with the alkene to generate the N-sulfonyl chloride product (azetidinone). The azetidinone can be reduced to the azetidine form using sodium borohydride in iodine and it is this step, which has been the current focus. A biological assay for each of the intermediate compounds will be performed usingthe third instar larval stage of Musca domestica.

Macrocyclic Enantioselective Fluorescence Sensors

Shaun Ben-Ari (Chemistry, Undergraduate)
Faculty Mentor: Frantz Folmer-Andersen (Chemistry)

We have developed an efficient synthesis of series of enantiomerically pure, large-ring macrocycles containing trans-1,2-diaminocyclohexane and 1,1-bi-2-naphthol subunits. The structures contain three mutually perpendicular two-fold rotational symmetry axes, and belong to the D2 point group. Because the macrocycles are chiral, they are in principle capable of preferentially binding one enantiomer of a guest molecule over the other within their interior cavities. This phenomenon was demonstrated towards several chiral carboxylic acid derivatives in aprotic solvents by both 1H NMR and fluorescence spectroscopies. In particular, the macrocycles display enantioselective fluorescence quenching in the presence of dibenzoyl tartaric acid (DBTA), thus giving an optical signal that is dependent on the enantiomeric excess (ee) of the DBTA sample. We hope to extend these systems to achieve a general method of photometrically quantifying the ees of various chiral carboxylic acid samples.

Acylhydrazone Stability by UV-Spectroscopy

Leander Bromley (Chemistry, Undergraduate)
Faculty Mentor: Frantz Folmer-Andersen (Chemistry)
Previously, we developed a 1H NMR-based method for studying the condensation of benzaldehyde derivates with acetic hydrazide in water, which involves monitoring product ratios as a function of solution pH and allows for determination of the equilibrium constant of the reaction. We then prepared a series of 10 benzaldehyde derivatives containing a hexaethylene glycol moiety (-(CH2O)6CH3) as a solubilizing group and various substituents in the meta and para positions in hopes of systematically correlating the equilibrium constant with reactant structure. Although this method successfully yields equilibrium constants in most cases, it is relatively imprecise and inconvenient. Consequently, we have recently been exploring the use of UV-spectrophotometry as an alternative analytical tool which should allow for more accurate determinations to be made on smaller samples. So far, we have derived a mathematical model of acylhydrazone condensation appropriate to this technique, overcome some kinetic challenges using a previously reported nucleophilic promoter, and obtained some promising preliminary data.

The Surface Chemistry of P. putida *Using AFM*

Sheena Henry (Chemistry, Undergraduate)
Faculty Mentor: Megan Ferguson (Chemistry)

Pseudomonas putida is a bacterium studied for its capability to degrade polycyclic aromatic hydrocarbons (PAHs), such as anthracene and naphthalene. This makes *P. putida* an attractive candidate for applications in bioremediation. In some cases *P. putida* has been used as a soil inoculant to remedy naphthalene-contaminated soil. The objective of this project is to understand the changes in cell surface chemistry when *P. putida* adapts to use PAHs as its primary carbon source. Sublimated anthracene slides were used to grow three different strains of *P. putida* for an extended period of time. These strains were also grown in their respective growth mediums and fixed to polylysine-coated glass slides. Additionally, biofilms were directly grown on glass cover slips and atomic force microscopy was used to take force maps on each sample. The force curve data enabled quantitative analysis of the stiffness and adhesion energy of each set of cells. It was observed that cells grown on anthracene are less stiff than those grown on regular growth medium. Additionally, the sublimated anthracene slides showed significantly less adhesion than cells growing in optimal conditions. Furthermore, biofilm formation seemed to increase cell stiffness. Understanding the cell surface chemistry changes undergone by *P. putida* will help to optimize systems to have the most efficient biodegradation possible and to predict the efficacy of degradation.

T. Arjuna*: Exploring Its Fungicidal Potential*

Alison Pletch, Laura Hollenbeck (Chemistry, Undergraduate)
Faculty Mentor: Preeti Dhar, Hon Ho (Chemistry, Biology)

Natural fungicides are desirable alternatives to anthropogenic fungicides that have negative effects on workers who use them and the environment. We explored the fungicidal potential of *Terminalia arjuna* (TA), a tree whose extract has demonstrated pesticidal properties but whose fungicidal potential has not been well-researched. Enhancing the interest in its potential as a fungicide is the fact that TA has clinically-demonstrated cardiotonic properties. The combination of a fungicide that also has heart-healthy properties merits its further research.We chose to explore the effects of TA on the growth of a fungus pathogenic to Hudson Valley agriculture, *Geotrichum candidum*. Bioassays were conducted with an ethanolic extract of TA against G. candidum inoculates on PDA media to determine the lowest concentration of TA extract demonstrating fungicidal activity. Growth inhibition was observed at concentrations of 9.89 uM of TA. Phytochemical analysis and further fractionation of the crude TA extract will be performed to determine the compound(s) active against *G. candidum*.

Degradation of Anthracene by P. putida

Ryan Taylor (Chemistry, Undergraduate)
Faculty Mentor: Megan Ferguson (Chemistry)

Polycyclic Aromatic Hydrocarbons (PAHs) are a group of semi-volatile organic compounds that are found in oil spills and ash from burned organic material. Some of these compounds are known carcinogens and can last for decades in the environment without degrading into less harmful compounds. The soil bacterium *Pseudomonas putida* is known for being able to break down these compounds and is used in remediation of polluted soils. This research examined two strains of *P. putida*, ATCC 17484 and ATCC 23973. Both strains were tested for their ability to break down the PAH anthracene in the presence or absence of helper compounds, which are other carbon sources that are easier to metabolize. The effect of multiple bacteria propagations on anthracene was also examined. Through microscope observations, GC-MS and direct exposure probe mass spectrometry, the amount of PAH degradation was analyzed for each variable to determine which scenario degrades the most PAH. Data shows that although helper compound enhances overall bacteria growth, the older propagation of the *P. putida* strain ATCC 17484 without the presence of a helper compound degrades anthracene the most readily. These results could be very helpful to local communities where buried oil drums have polluted the soil.

Melting Studies of DNA Duplexes with a Surfactant

Adam Rimawi, Kathleen Westervelt (Chemistry, Undergraduate)
Faculty Mentor: Pamela St. John (Chemistry)

Past studies exploring the interactions between the negatively charged phosphate groups in DNA and a surfactants hydrophilic head group have shown that aggregates can form when the ratio of surfactant to DNA is approximately one. We have focused on studying the stability of these aggregates using oligonculeotides or short strands of DNA, from 20 to 100 bases in length, and CTAB, a surfactant which is a quaternary ammonium salt. UV spectroscopy was used to collect melting curves of the duplexes in the presence of CTAB where we have observed, in addition to the transition from duplex to single strands, a transition at a higher temperature which we attribute to the melting of the DNA-aggregate.

Accent Change in Telugu/English Bilinguals

Susan Mason, Catherine Cantone (Communication Disorders, Undergraduate)
Faculty Mentor: Anne Olmstead, Navin Viswanathan (Psychology)

Gestural drift is a phenomenon in which perceptually-guided changes in speech production occur due to exposure to an ambient language environment over time (Sancier & Fowler, 1997). For example, a case study of a Brazilian-Portuguese/English bilingual traveling between her native Brazil and the U.S. showed that her production values for consonantal voice onset times (VOT) in both languages shifted to reflect the production rules of the predominant language in the area (Sancier & Fowler, 1997). In our study, we propose to investigate gestural drift in Telugu (a language spoken in India)/English bilinguals. We focus on two questions. First, are production shifts qualitatively different from those observed in the case of Portuguese/English bilinguals? Secondly, can these production shifts, which normally occur over long periods, be induced during a short interactive task? We propose to use an interactive task between a Telugu/English bilingual and an American English monolingual in which is pronunciation of words will lead to confusion and failure to complete the task. We hypothesize that the Telugu/English bilinguals will be pushed toward a target production shift in order to minimize phoneme confusion by their American English partners. Productions of the bilingual speaker will be measured acoustically and perceptually before, during, and after the task. This will permit us to examine whether short-term changes in production occur and whether the pattern of change is different.

The Transition to Grandparenthood

Kristen Gray (Communication & Media, Undergraduate)
Faculty Mentor: Elizabeth Munz (Communication & Media)

The transition to grandparenthood is an exciting time for soon-to-be or new grandparents and their adult children as members of a family transition into new roles. In the communication field the vast majority of research on grandparenthood has focused on the grandparent-grandchild relationship. Recently, researchers have started to look at the adult childs perspective on communication between grandparents and their adult children during this time of transition. This present investigation is focused on the grandparents perspective on the communication between them and their adult children. Participants in this study are soon-to-be or new grandparents welcoming the first child of one of their children. For new grandparents, their grandchild must be under age 1. The semi-structured interviews assess the grandparents opinion of communication with their adult child (including any changes) based on geographic location, communication medium, gender, personality, and other factors. Participants are offering their accounts of communication during either the expectant and/or the post-partum stages of this transition, as relevant to their current situation. This research project will reveal grandparents perspectives on topics including hearing the big news, how and when (if ever) to dispense advice, and their desire for patterns of communication with their adult children in the future.

An Agent-Based Simulation for a Credit Card Market

Haifeng Zhang (Computer Science, Graduate)
Faculty Mentor: Keqin Li (Computer Science)

For decades, economists, psychologists, and other social scientists have been interested in explaining, analyzing, and predicting consumer behaviors in various financial markets. However, human behaviors are so hard to define and study, scientists only obtained limited knowledge from their individual professional prospective. Particularly, typical research approaches are no more than empirical discovery and theoretical exploration. Credit card market has evolved as the most important personal financial market over the past century in most countries. Researchers have been involved in investigating this market and gained rich conclusions in terms of consumer behaviors, market characteristics, etc. Nevertheless, how do they test hypotheses in the context of a dynamic market is still an unsolved problem. Unfortunately, conventional mathematical methods seems intractable to address dynamic and complex problems. The project proposes a multi-agent-based simulation system, a state-of-the-art instrument, trying to solve the puzzle in the credit card market. This system, composed of several functional models, is built under an interactive, self-organized, and intelligent scheme. It aims to facilitate a bottom up examination of consumers perception, evaluation, decision making, and adaptive behaviors, and to help researchers test hypotheses and gain insights of consumer behaviors and market features.

Traffic Congestion Causes and Policy Solutions

Patrick Cook (Economics, Undergraduate)
Faculty Mentor: Simin Mozayeni (Economics)

This research explores factors that affect congestion on arteries of 12 Metropolitan Statistical Areas in the Eastern United States. In literature there is evidence to support that growth of highway mileage will not generally alleviate congestion. In this model, mileage capacity per peak time travelers population, cost of congestion to travelers, and total commuters effect on travel time index is used to examine this hypothesis. Travel time index is the ratio of travel time in the peak periods to travel time in free-flow. The effect of the presence of major mass transit service to these major central business districts on congestion will also be examined, using a dummy variable. The Eastern states are selected because they use gas and other dedicated taxes to fund transportation. Our sample is cross-sectional. MSA specific regressions are used to test the hypothesis. In a comparative analysis we examine similarities and differences to draw conclusions for policy. Two years with full employment will be selected to ensure maximum usage is examined. Preliminary regression results for Baltimore MSA show expected signs and significant coefficient values for determinants. The results had significant t-values and adjusted R2 that strongly supports the collective effects of the variables. Preliminary research results rejects the hypothesis that increases in mileage will not alleviate peak hour congestion, if investment is commensurate with population increases.

Competition in the Video Game Console Industry

Javier Oriol, Gutierrez Barguilla (Economics, Undergraduate)
Faculty Mentor: Simin Mozayeni (Economics)

The video game console market has long been considered an example of indirect network effect. This effect occurs when the consumer valuation of the primary product (consoles) increases with the size of a complementary good market (video games), and therefore in this case consoles themselves would not have any value apart from facilitating the use of compatible games. The three companies present in this market (Microsoft, Nintendo and Sony) compete to win their share of consumers through the offer of compatible games developed by software companies. This paper estimates the demand for consoles using different linear regression models (Ordinary Least Squares and 2-Step Least Squares) for each console, using variables such as sales, price, advertising, R&D and game quality. In the results we observe that the variable which controls for the indirect network effect (game quality) is not statistically significant whereas the other variables are highly significant (with high t-statistics significant at the 99% confidence level), have the expected positive or negative signs and a moderately high R-squared. We conclude that the video game industry has experienced a dramatic change due to the absence of this effect, and that this absence can also show us a general trend about where the digital entertainment industry is going.

Sustainable Development in China and Taiwan

Meredith Henshaw (Economics, Undergraduate)
Faculty Mentor: Sara Hsu (Economics)

In this paper, we examine sustainable development in Taiwan and China. While we know a lot about the economic growth paths of both, we do not know enough about their sustainability for future growth. In this project, we examine sustainability in terms of social and environmental factors. Though both are populous nations, Taiwan has developed with relative social sustainability, while China is experiencing growing inequality. As population pressures create more challenges to sustainable development, both must do more to prevent further environmental degradation, as it is exceedingly prevalent in both China and Taiwan. Through literature review, we examine such challenges from a comparative perspective, studying what both countries can learn in terms of sustainable growth. We first examine specific parts of the economic literature on Taiwan and China, looking at environmental and social impacts of economic policies and programs (i.e., national/sub-national economic policy, industrial programs, foreign and domestic company programs, and infrastructure projects), then draw conclusions about what is necessary for future study and policy making for sustainable development. Sustainability is critical to future growth to avoid further environmental degradation and social exclusion. With varying levels of equality and sustainability in their economic development paths, the governments of both China and Taiwan must seek to implement policies that encourage sustainable development.

Reaching the Poorest of the Poor?

Claudia Robles-Garcia (Economics)
Faculty Mentor: Simin Mozayeni (Economics)

Due to a recent shift towards financial sustainability and efficiency in microfinance institutions (hereinafter, MFIs), it is significant to evaluate the costs, if any, of such a transformation in terms of the number and the socioeconomic level of the borrowers. Hence, this paper aims to research a potential trade-off between financial sustainability and outreach of microfinance programs in Latin America. In this researchs econometric model, the dependent variable of interest, that is, financial sustainability, is assessed using several financial indicators: the operational self-sufficiency index (OSS), the return on assets (ROA) and the return on equity (ROE). In addition, in order to evaluate the other dimension in our hypothesis, we approximated the outreach of MFIs by incorporating to our model the total number of borrowers, the average loan balances and the percentage of women borrowers. Finally, a possible lack of compatibility between MFIs being financially sustainable and their capacity to reach the poorest of the poor is relevant from a policy making perspective. Therefore, an attempt is made to quantify the size of such a trade-off and the implications of a marginal improvement in financial sustainability of MFIs on outreach

The Economic Experiences of Elizabeth Montagu

Claudia Robles-Garcia (Economics)
Faculty Mentor: Edith Kuiper (Economics and Women's Studies)

Mrs. Elizabeth Robinson Montagu (1718-1800) is mostly known nowadays for her patronage within the Bluestockings Society in London. However, not much research has been done so far on the economic facets of her life. This paper provides an overview of this literature, reports on research conducted on a set of unpublished letters by Elizabeth Montagu, and presents her as an efficient and strategic businesswoman; an innovative and fair landlady; and a visible and powerful persona with challenging ideas on agriculture, labor, and social inequality. The paper also addresses the fact that, despite her interesting insights in the economy and her being very well connected in British high-society, Mrs. Montagu was unable to access the economic discourse of her time due to her gender. Thus, her economic experience, along with that of many eighteenth-century women, was left out and regarded as irrelevant by early and later political economists. The paper discusses the role gender played in the constitution of eighteenth century academic networks and knowledge production, and assesses Montagus contribution and the relevance of her work in this light. In addition, for this occasion, the paper provides link to the work and life of women active as entrepreneurs, farmers and social reformers in New York State during the eighteenth century to illustrate the importance of women's economic writing in general.

The Emergence of the Converso and Identity Construction in Late Medieval Spain

Elizabeth Koza (History, Medieval Studies)
Faculty Mentor: Michael Vargas (History)

Historians have held, and continue to accept, that the animosity which Christians felt against Jews eventually leads to the expulsion of the Jews from Spain in 1492. However, the conversion of Jews to Christianity effectively created a prevailing third social group conversos. My assertion is twofold: one, the historiography of Jewish-Christians relations prior to the Jewish expulsion has not adequately understood this third group nor its importance to the aforementioned relations. Second, that recognizing the cultural and political intermediacy to which the conversos contribute is central to understanding the increased divisiveness which led to the expulsion of Jews, but not the converso, and that occurrence drove a wedge between the notion of Old Christians and those possessing Jewish heritage. As an undergraduate, I can offer only an overview, mostly of translated texts and historiographical accounts, and it will be clear that I am raising more questions than I can answer. However, whether Ferdinand and Isabella expelled Spain's Jews because they were Jewish, or rather because of the mounting political pressures due to the proselytizing of former co-religionist families is a question which I point to here so that, perhaps, I can study it more in depth in the future.

Unraveling Heritage and Native Spanish Speakers

Juan Canales (Linguistics)
Faculty Mentor: Oksana Laleko (Linguistics)

Innovative research on heritage speakers - bilinguals whose native language acquisition is interrupted early on in favor of a dominant language (i.e., English) has revealed that their knowledge of their mother tongues has been systematically restructured (Polinsky 1996, 1997; Laleko, 2010). The past tense is susceptible to this restructuring in Spanish and Russian, which, unlike English, can be framed in two ways using the Preterite or the Imperfect - differing in how they encapsulate situations in time (Montrul 2002, 2009; Laleko 2008, 2011). Bearing in mind that the verb's semantics also plays a role in how a past event may be constructed (Vendler 1967), we suggest that the verb's inherent time constraints influence the type of past tense morphology chosen by heritage speakers, and that this may be a way to distinguish them from native speakers. In this study, heritage Spanish speakers (n=3) and native Spanish speakers (n=3) filled out a background questionnaire, completed a cloze task to determine proficiencies, and rated well and ill-formed sentences designed to measure the correlation of verb type with Imperfect/Preterite choice. Subjects also completed a narration task to elicit natural, unrehearsed discourse. Our results suggest that the verb's inherent time structure influences heritage speakers' choice of past tense morphology, supporting our hypothesis and challenging the stability of language development under contextually-limited, reduced input conditions.

Representing a Rainbow as a Bessel's Function

Laura Zaoutis (Mathematics, Undergraduate)
Faculty Mentor: Natalie Cartwright (Mathematics)

The purpose of this study is to represent a rainbow as a Bessel function. Supernumerary bows, Alexander's dark space and higher-order rainbows can all be explained using reflection and refraction laws, geometry, and calculus. The scattered wavefronts exiting a raindrop after two refractions and numerous reflections can be approximated with a cubic polynomial. From this, it is possible to derive an integral for the value of the phase change between two starting points to a point a great distance from a raindrop in which a ray of light has been refracted and reflected; the resulting integral is called Airy's integral. Finally Airy's integral can be related to a Bessel function of 1/3 order. The study is completed with an experiment involving refraction of water in a Florence flask.

Quantifying Blastema Growth in Planaria

Thomas Donovan (Physics, Undergraduate)
Faculty Mentor: Spencer Mass, Richard Halpern (Biology, Physics)

Regeneration in flatworms occurs with two distinct processes first identified by TH Morgan in the late 19th century. The first process, epimorphosis, involves growth of new tissue called a blastema. Quantifying blastemal growth is both difficult and tedious; it is also prone to error when performed manually. We have developed a method for automating image analysis and measuring changes to growth and regeneration using a macro we designed for FIJI, a variant of the open source NIH Image/J software. FIJI includes a scriptable suite of tools for automated data mining that can be trained to find patterns and can adaptively learn. Our Macro uses FIJI in conjunction with Excel to automate the task of quantifying blastema growth across very large data sets with a minimum of human involvement, a reduction of human error and enables high through-put analysis of biological imaging.

Structure and Properties of Ru (II) Thiocyanate linkage

Joshua Paugh (Physics)
Faculty Mentor: Stacie Nunes (Physics)

Two Ruthenium-Thiocyanate linkage isomers, [(p-cym)Ru(bpy)(NCS)]+ are the focus of this project, because their energy differences have been measured in solutions of methanol and acetone by Vandenburgh et al, who also provided crystal structure data. The Thiocyanate is bonded to the Ru through the N in one isomer, and through the S in the other. Optimizations of the molecules are done using different computational methods to determine geometries and absolute energies. Preliminary calculations with several methods led us to choose the B3LYP functional of Density Functional Theory as the focus of the study. The STO-3G, 3-21G, and augmented 3-21G basis sets were used for optimizations in a vacuum. Experimental data shows that isomer 1 is the preferred isomer by a small margin, while our results predicted isomer 2 to be preferred. Although the predicted structures had notable differences to the experimental data with respect to the Ru-Thiocyanate bond angle, the results showed overall good agreement, and that the 3-21G basis set augmented with polarization functions (3-21G*) provided the most sufficient geometry data. Therefore, optimizations in solutions of methanol and acetone were also performed using B3LYP/3-21G* to go along with the experimental data, as well as a transition state calculation using this method. Although the predicted preferred isomer in the solutions was still isomer 2, the Ru-Thiocyanate bond angle was in better agreement with experimental data.

Orthographic Processing in Late Bilinguals

Michael Acerra, Nathan Earl, Elizabeth Sacchi (Psychology, Undergraduate)
Faculty Mentor: Giordana Grossi (Psychology)

The N1 is an Event-Related Potential (ERP) component occurring between 120 and 170 ms over the posterior sites. Its amplitude is modulated by the orthographic characteristics of words and, in expert readers, is larger over the left than right sites. Recent research shows that the N1 is also more left-lateralized for the second language (L2) in more, compared to less, experienced bilinguals. The current experiment investigates the changes in N1 amplitude associated with learning a second language (Spanish). Three groups of participants (advanced learners, intermediate learners, monolinguals) will perform a lexical decision task in both English (L1) and Spanish (L2). The first goal of the study is to investigate potential changes in left-lateralization associated with visual word recognition when students learn a second language. It is predicted that participants with more experience in L2 would exhibit a larger lateralization of the N1 for Spanish stimuli, compared to less experienced bilinguals. The second goal is to determine whether
the amplitude of the N1 elicited by Spanish stimuli is influenced by how closely these stimuli resemble English (L1) words. It is hypothesized that such influenced would be larger in less, compared to more proficient, bilinguals, due to the lower familiarity of less proficient bilinguals with the word form of second language.

Student Motivation and Course Choices

Ariel Avilla (Psychology, Undergraduate)
Faculty Mentor: Corwin Senko (Psychology)

This research examined whether students academic goals and the anticipated importance of the material to their careers together influence their choice of courses during registration. Participants completed an online survey assessing their academic goals, such as to master the material or to minimize their workload, and then did a task simulating the course selection process. This entailed picking one of four possible sections of a required course for their major. Half of the participants were asked to imagine that the course is personally meaningful for their career/future (high utility), while the other half imagined it was not (low utility). They were asked to choose between four sections of the same required course. Each section of the course emphasized a different professor quality: challenging students intellectually, being clear, giving small workloads, or being entertaining. They then repeated this task several times with new sets of course sections that, again, vary on these professor qualities. Preliminary analyses show that students were more apt to choose intellectually challenging professors sections if they had high instead of low utility value. Also, students whose goals involved minimizing their workload, as expected, favored easy instructors, especially when a course had low utility value.

Narcissism and Reactions to Overqualification

Elena Brondolo, Carrie Sauer (Psychology, Undergraduate)
Faculty Mentor: Douglas Maynard (Psychology)

We examine the role of narcissism in employees perceptions of and reactions to overqualification. We argue that narcissistic individuals are more likely to believe that they are overqualified, and that there will be a stronger negative relationship between perceived overqualification and both job satisfaction and work stress. Prior studies have found that overqualification can lead to job dissatisfaction. Limited research has been done to discuss the relationship between narcissism and overqualification, however it is our hypothesis that employees who are more narcissistic tend to feel that they are more entitled and consequently have higher rates of perceived overqualification and job dissatisfaction. Another aim of our study is to examine the correlation between perceived overqualification and stress. Testing will be performed using a survey comprised of several different measures, including the Stress Diagnostic Scale, the Narcissistic Personality Inventory-37, the Scale of Perceived Overqualification, and the Job in General.

The Why and How of Academics

Samantha Carraro (Psychology, Undergraduate)
Faculty Mentor: Corwin Senko (Psychology)

A simple and seemingly explicit action can be interpreted in myriad ways. "Reading a book" can be construed as a concrete activity such as "following lines of print" or "turning a page," or as an abstract activity such as "obtaining knowledge" or "being entertained." Our study examines whether student's preferred type of construal corresponds with their academic achievement goals. Achievement goal theory encompasses two broad goals: performance goals and mastery goals. Students who look to outperform others pursue performance goals, while students who strive to improve ability pursue mastery goals. We posit that performance oriented students adopt low-level, concrete cosntruals of actions (e.g., "following lines of print") while the mastery oriented students adopt high-level, abstract construals (e.g., "obtaining knowledge"). We tested this theory in a survey study that supported this hypothesis, and are currently in the midst of an experiment that tests if the two achievement goals have causal effects on construal level, and if this in turn affects how they perform the task.

Understanding Compensation for Coarticulation

Stefanie Catalano, Susan Mason, Josh Dorsi (Psychology, Communication Disorders, Undergraduate)

Faculty Mentor: Navin Viswanathan (Psychology)

During speech production, segments are not articulated independently instead, the production of each segment is influenced by the preceding and following segments in a process called coarticulation (Mann, 1980). While coarticulation makes rapid production of speech possible, it has the effect of altering the acoustic and gestural properties of the final segments. For example, when the segment [ga] is produced following [al] or [ar], it has different gestural and acoustic properties relative to a [ga] produced in isolation (Mann, 1980). This shift in production results in a shift in perception referred to as Compensation for Coarticulation such that when listeners are presented with items from a [ga]-[da] continuum and asked to perform a two-alternative-force-choice task, they report more g responses following [al] as compared to targets following [ar] (Mann, 1980). In this study, we will investigate this response shift in coarticulatory contexts by asking participants, in addition to identifying target phonemes, to also contexts by asking participants, in addition to identifying target phonemes, to also rate their goodness of fit (i.e., how good an instance of that particular category, the given sound is[see Allen & Miller, 2005]). Specifically, we investigate whether shifts in target identification reported by past studies (e.g., Mann, 1980) is also accompanied by corresponding shifts in category prototypes.

Toward an Evolutionary Neurocognitive Model of OCD

Daniel Glass (Psychology, Graduate)
Faculty Mentor: Glenn Geher (Psychology)

Obsessive-Compulsive Disorder (OCD) is a disorder characterized by its clinical heterogeneity, but also a commonality of symptom clusters known as symptom dimensions. Previous research using factor analysis has shown that the symptom-structure of OCD falls into four factors contamination fears and cleaning compulsions, checking rituals and violent or aggressive thoughts, obsessions with numbers and order, and hoarding, respectively. The purpose of this study was to replicate, in a community sample, the four-factor model found in a previous meta-analysis. The results support the four-factor model and suggest that OCD affects the brain in one of a number of discrete and predictable ways because the affected domains are underlied by discrete neural systems in the brain, which may meet the criteria for evolved modules. These findings can inform the understanding and treatment of OCD as well as offer insight into the neurocognitive structure of the normally functioning brain

Career Indecision

Jessica Gross, Brienne Schiano, Jason Zanfordino, Alex Wozniak (Psychology)
Faculty Mentor: Doug Maynard (Psychology)

With today's economy the way it is, many students are graduating college struggling with deciding to either find a job, or if they should continue on with their education. The purpose of this study is to better understand the attitudes and actions of graduating college seniors with respect to life after graduation. This research is being conducted to expand on information on this. An online survey will consist of measures such as the Core Self-Evaluations Scale (CSES), Parental Career-Related Behaviors (PCB), Career Factors Inventory (CFI) to measure core self-evaluations, parental influence, and career choice anxiety. To examine career indecision, the survey will also contain questions regarding students extracurricular activities and whether or not they have employment options lined up for after college or plan to attend graduate school. To gather more information on vocational factors, we will ask participants what there major(s) is/are which will determine if they were in a field that tends to have a direct path for what to do after college (i.e. engineering or pre-med) or a field that has more open ended options (i.e. psychology, English). This study is still being conducted.

Situational Specific Emotional States

Amanda Guitar, Daniel Glass, Alexandra Saba (Psychology, Graduate)
Faculty Mentor: Glenn Geher (Psychology)

Scholars have suggested that emotions increase fitness by adjusting the response of the individual to the specific situation. Thus, the particular emotion experienced by an individual should be dependent on whether the situation is a threat/opportunity, whether it is in the physical/social domain, and if the outcome is a success/failure. Nesse and Ellsworth (2009) created a model around this idea that predicts which emotions should arise in these particular situations. The current study empirically tested this model using the virtual simulation program 'Second Life.' Participants' "avatars" were placed in socially and physically threatening and opportunistic situations; furthermore, participants were randomly assigned to succeed or fail at each task. After completing each task, participants were asked to rate the degree to which they experienced the emotions predicted by the model to arise in these situations. Significant results were found for the social opportunity, physical threat, and social threat (failure condition only).

The Big Five and Call Center Preferences

Christian Kuiphoff (Psychology, Undergraduate)
Faculty Mentor: Maryalice Citera (Psychology)

The purpose of this study is to determine the association among the Big Five personality traits and preference for communication mode (text, chat, phone) when handling a problem through a call center. Each person has different personality traits and it is possible that these differences could lead to varying communication preferences when dealing with a call center. Since there are multiple ways to get in contact with a call center we wanted to identify which communication mode would be preferred by different individuals. For this survey, I recruited college students to participate in an online survey. The research used a between subjects design varying the communication mode: phone, text, and online chat. The dependent measure was call center preferences. Personality was measured using the 44-item Big Five Inventory. The questions relating to preferences were created for this survey. We anticipate that extraversion will correlate with preferences for phone calling while neuroticism will correlate with preferences for chat or texting. We hypothesized that there should be a significant correlation between personality and communication preferences. The implications being that if a company can identify its customer's personality, then it can cater to its customer service needs more effectively. This could potentially increase satisfaction and reduce stress resulting in a more committed and loyal customer base.

Dread and Other Emotions, Motivators and Demotivators

Claire Lichtenberg, Laura Santiago, Andrew Foster (Psychology, Undergraduate)
Faculty Mentor: Maryalice Citera (Psychology)

People have a variety of different emotional reactions when faced with new and unexpected situations. Some of these emotional reactions motivate individuals, and some demotivate individuals. The current project proposes to look at four particular emotional reactions, with a specific concentration on the emotion of dread. The other emotions being looked at are anxiety, enthusiasm, and contentment. These four emotions can be represented in opposite quadrants on the Russell Circumplex Model. While anxiety and enthusiasm are high arousal, dread and contentment are low arousal. Contentment and enthusiasm are high on pleasantness, while anxiety and dread reflect unpleasantness. For the purposes of this project dread is defined as an anticipatory fear that makes an individual reluctant to face a challenge in the near future. Similar to fear and anxiety, it is an avoidance-motivated response that is unpleasant. Participants will be given one of four scenarios to read and rate using an emotional adjective scale. The purpose is to examine whether the scale can be used to identify differences in the scenarios, the factor structure of the scale, and any consistent confusions. The results will help us determine how well participant can distinguish between an anxiety scenario and a dread scenario, as well as high and low arousal scenarios.

Optimism, Community Service, and Happiness

Kaitlin Andersen and Jessica Gross (Psychology)
(Faculty Mentor: Maryalice Citera)

This study investigated the relationship between optimism, community service, and happiness. We hypothesized that optimistic individuals who participate in more community service would be happier because research states that people are more likely to report being happy because of community service. 107 college students over the age of 18 responded to an online survey containing three scales. The Life Orientation Test was used to determine optimism-pessimism. The Authentic Happiness Scale was used to determine a participant's general level of happiness. We created a community service scale that asked participants how often they participated in community service and how fulfilling they found their volunteer efforts to be. The hypotheses of this experiment were that optimistic people would be more likely to participate in community service, that community service predicts happiness levels, and that optimistic people report more happiness because of community service participation. The results show an interaction between optimism and community service on a person's happiness. Due to this interaction, the main effects of optimism on happiness and community service on happiness were not significant. While the hypotheses were not supported, the data shows an interesting pattern. For optimists, their happiness depends on being involved in helping others through community service. For people low in optimism, community service did not predict happiness.

Growing into Love

Kristofer Pistillo (Psychology)
Faculty Mentor: Maryalice Citera (Psychology)

Love is considered to be an attitude and, just like other attitudes, can change. If love can change, perhaps love types can change as well. Change can be brought on by personal growth and one of the biggest transitional periods for students is their years in college. The rationale was to examine whether love types were contingent on personal growth levels. We hypothesized that (1) first year college students would be more likely to practice and participate in ludic (non-committed, game like) type love. (2) Seniors would be more likely to participate in Eros, Storge, and Pragma type love, and (3) if seniors were more likely to participate in these three types of love, then they would score higher on personal growth. The results indicated that most of the hypotheses were incorrect. First- years participated least in Ludic type love while seniors participated least in Eros and Storge type loves in comparison to Seniors. Although this was the case, seniors did seem to practice Pragma type love more that first-years and like prior research my study supports the idea that there is a significant development in personal growth between your first year and senior year in college.

Comparing Perception of Stop-Consonants by Spanish

Sarath Manuel, Alexandria Fontanez (Psychology, Undergraduate)
Faculty Mentor: Navin Viswanathan, Anne Olmstead (Psychology)

Despite many similarities between Spanish and English, there are significant phonetic and phonological differences between the two languages. One difference is in the voice onset times (VOT; i.e., the amount of time between when a vocal tract constriction is released and when vibration of vocal folds starts) of word-initial stops. Here we will focus on the bilabial stops /p/and /b/ distinguished in both languages by VOT. Specifically, Spanish [b] is pre-voiced with a VOT of approximately -140ms whereas in English the same category has a VOT of approximately 0ms (Lisker & Abramson, 1963). In our study, we propose to investigate Spanish and English listeners sensitivity to VOT and vowel length information when categorizing bilabial stops. Specifically, listeners will be presented with tokens varying on VOT from -60ms to 60ms. Each token will be paired with vowels of three different lengths; short (175ms), medium (225ms), and long (275ms). Participants will judge the consonant in each token, making a forced choice between /p/ and /b/. We expect that English listeners category boundaries will occur at longer VOTs than the boundaries of Spanish listeners, following the patterns of their respective languages. Additionally, we expect that English listeners boundaries will shift as a function of vowel length, in accordance with the relationship that exists in English, whereas the boundaries of Spanish listeners will be unaffected.

Olfactory Detection of Female Ovulation

Grant Trouton, Mandy Guitar, Rachael Carmen, Terry Grandis (Psychology, Graduate)
Faculty Mentor: Gleen Geher (Psychology)

Do non-heterosexual males typically find ovulating women to be more attractive than non-ovulating women? Previous research conducted by Singh and Bronstad (2001), and Thornhill and Gangestad (1999), have examined male abilities to detect female ovulation via t-shirt studies, but have yet to include male sexual orientation as part of their analysis. To fill this research gap, we attempt to test whether people of varying sexual orientations (e.g., homosexual, bisexual, heterosexual) can distinguish between a female during different phases of her menstrual cycle (e.g., follicular or ovulatory phase), based on smell. Theoretically, since homosexual males are least reliant on female pheremonal cues that indicate fertility, we hypothesize that homosexual males will be poorest at distinguishing between the follicular and ovulatory phases of a woman's reproductive cycle. Similarly, we hypothesize that bisexual males will be able to detect between these two stages moreso than homosexual males, but less so than heterosexual males.

Does Phonology Affect in Letter Identification?

Victoria Schuster (Psychology, Undergraduate)
Faculty Mentor: Giordana Grossi (Psychology)

Letter identification is highly contextual. When participants are briefly presented with words, pseudowords (pical) and nonwords (pclia), and are asked to identify the letter in a given position, accuracy is generally larger for words compared to pseudowords (word superiority effect, WSE) and for pseudowords compared to nonwords (pseudoword superiority effect, PSE). These two effects are usually interpreted in terms of exical/semantic (WSE) and orthographic (PSE) facilitation. Data from two previous studies showed that the size of these two effects was not diminished by articulatory suppression or shadowing. Therefore, it was concluded that phonological processing does not contribute to the two superiority effects. However, reliance on phonological processing was not assessed. In this study, participants will identify letters in nonwords and three types of pseudowords, varying in number of syllables and phonemes. Spoehr (1978) showed that accuracy in letter identification was influenced by these two factors, reflecting the participants reliance on phonology. Here, participants will engage in two conditions: with and without a phonological interference task. We predict that phonology will affect performance in the control condition. In the experimental condition, we predict that the effect of phonological factors would be reduced or eliminated; the presence of the pseudoword superiority effect will suggest that this effect mainly reflects orthographic processing.

Who Should Counsel LGB Individuals?

Rebecca Shaw (Psychology, Undergraduate)
Faculty Mentor: Kathleen Tillman (Psychology)

The lesbian, gay, and bisexual (LGB) community has long faced social stigmatization, marginalization, ridicule, and even violence. Little to no research has been conducted to come to a consensus among experts in the counseling field regarding the necessary traits of counselors working with LGB clients. This study investigated the views of experts in the counseling field to determine the necessary personal and professional qualities for counselors working with LGB clients. This study used the Delphi method, which used multiple rounds of survey data collection until a consensus was reached among experts within the field of counseling. In each survey, counselors were asked to rank, in terms of importance, personal and professional qualities that a counselor working with LGB clients should possess. Study results indicate that counseling professionals consider the following broad categories to be important when working with LGB individuals: basic counseling skills, LGB-specific counseling skills, training and supervision, therapist self-awareness, knowledge of issues that impact the LGB community, resources and referrals, personal and professional alliance with the LGB community, and knowledge of LGB culture.

Understanding Outfielder Skill

Patrick Sylvester (Psychology, Undergraduate)
Faculty Mentor: Anne Olmstead (Psychology)

We investigate how baseball outfielders know where to run in order to catch a fly ball, a problem known as the outfielder problem. This task poses a perceptual problem because the visual information used to guide running paths varies as a function of the movement of the perceiver. Most theories of the outfielder problem take a method of constant adjustment approach. This approach explains the solution to the outfielder problem by proposing that outfielders run in such a way as to keep one perceptual variable constant (e.g., Chapman, 1968). We hypothesize that an expert outfielder can tune into perceptual variables that will help them estimate where the ball will eventually land very early in the balls trajectory, thus allowing them to start running in the correct direction. Non-experts may not have the experience necessary to use this perceptual information. We will test this hypothesis by examining the ability of both experts and non-experts to judge the landing position of a fly ball based only on the first moments of the balls trajectory. We will edit videos to show only the initial 500 milliseconds of the balls flight. The participants will be asked to estimate where the landing position of each ball would have been, and whether or not they believe they would have caught that ball. We hypothesize that outfielders with expert-level experience, will be able to make more accurate judgments of the general area where the fly ball will land than non-experts.

Vieques Art Project

Teresa Medrano, Mariel Ramirez (Sociology, Undergraduate)
Faculty Mentor: Roberto Velez Velez (Sociology)

The purpose of our research project is to examine the struggle and protest of the people in Vieques, Puerto Rico, during the U.S. military lengthen presence through art. We have collected, organized, and analyzed data with the goal to search and identify specific themes and patterns that provide an overall meaning of the message of the movement. We gathered various forms of cultural expression – music, paintings and poems – that were produced during and after the social movement in Vieques (1999-2004). We distinguished between the works of local artists and artists from Puerto Rico. Through content and textual analysis we will be able to retrieve patterns, whether in structure of poetry or in the author's use of repetition. Our expectations are to later identify how different forms of artistic expression interrelate with one another, or differ in their textual forms. In conclusion, we will attempt to explore and carefully examine these poems and lyrics of men and women who, in their own ways, created a movement and allowed for an audience to feel a sense of unity and understanding from their shared experiences. Further, this project will bring awareness of the injustices that people from Vieques faced.

The Second Shift and Fathers

Alicia Loscalzo (Sociology, Undergraduate)
Faculty Mentor: Judith Halasz (Sociology)

This exploratory research project seeks to evaluate the role of fathers in the second shift. As American mothers' traditional childcare and household duties within the home have been compounded by the addition of an eight-hour workday, the responsibilities and expectations of fathers have changed. Have fathers become supporters and increased their involvement of sharing duties in the domestic sphere with mothers, or are they simply slackers avoiding this additional labor at all costs and perpetuating the second shift? The changing structure of the family institution has been demonstrated as the average family of a sole breadwinning father and housewife with 2.5 children is seen as more unreachable and irrational. With rising costs of living and increased gender
equality, females have increased their presence in the workforce. There is an ongoing debate regarding the actual quantity and quality of effort fathers devote to childcare and housework, leading to a lack of a definitive, concrete answer to the prevalence of the second shift today. As some research shows, mothers and fathers work equally demanding and long days in paid and unpaid labor, while other studies conclude mothers are still solely responsible for this double burden of work as fathers have yet to dedicate effort to share the second shift. This meta-analysis evaluates the existing research on fathers contributions to the second shift with an eye towards implications for family policy.

Environmentalism and Feminism in Miyazakis Films

Zafir Mawla (Sociology, Undergraduate)
Faculty Mentor: Judith Halasz (Sociology)

The objective of this research is to see if there is a connection between the themes of environmentalism and feminism in Hayao Miyazakis films, using both qualitative and quantitative research methods. The qualitative research consists of careful and thorough textual analyses of two of Miyazakis films: Nausicaa of the Valley of the Wind (1984) and Princess Mononoke (1997). Before analyzing both films, it was necessary to understand the styles and techniques Miyazaki uses when creating his films and how the themes of environmentalism and feminism are portrayed based on Miyazakis personal life events. The analysis of both films was conducted by looking at the environmental and feminist images in each film. The quantitative research consists of systematically identifying scenes that represented images of environmentalism and feminism in both films and tabulating and analyzing the data. Based on the findings of this research, there is indeed a relationship between environmentalism and feminism in both of Miyazakis films. Both films have strong female protagonists that encounter severe environmental pressures that threaten the dignity of life in their homes.

Shifts in the Treatment of Bipolar Disorder

Carrie Sauer (Sociology, Undergraduate)
Faculty Mentor: Judith Halasz (Sociology)

Psychiatric treatment methods are typically reflective of concurrent sociocultural movements and trends. To understand this connection, the social components that lead to changes in the treatment of psychological disorders are examined, with a focus on bipolar disorder. For the purposes of this paper, bipolar disorder is defined using the current edition of the Diagnostic and Statistic Manual of Mental Disorders; for research dating before the DSM was published, the paper examines the treatment used for related psychological disorders (in most instances, to melancholia and/or madness). Research describes the shifts in the treatment of bipolar disorder from the ancient practices such as bloodletting and trephination, to the corporal treatments and restraining devices popularized within the early asylums, to modern psychiatry's fixation with psychopharmacology. Issues related to psychopharmacology are explored, including recent increases in frequency of overdiagnosis. Both the causes and the notable impacts of this prevailing movement in psychiatric treatment are explained, with special attention to the concept of disease-mongering, and how its resulting societal hypochondria has altered cultural perceptions of bipolar disorder and mood-stabilizing medication.

Fierce to Farouche: The Hierarchy of Costumes

Kyle Fassett (Theatre Arts)
Faculty Mentor: Andrea Varga, Bernadette Morris (Theatre Arts, Communication)

For my Theatre Arts project I conducted historic dress research and worked on actual costumes for Anton Chekhov's play Three Sisters. I researched the time frame in which the play was written, the authors perspective and intent, and then analyzed character actions and motives while relating them to the physical choices for the production costume design. This play narrates the shifts of power between family members in a highly repressive society and isolated military community. Tension was represented in the way costumes changed as characters lost or gained status; color schemes and styles reflected this through the transition of the sisters from rich hues and elaborate silhouettes, to faded colors, simple shapes and textures, while the antagonist gained saturation and detail as she achieved status. Color theory and nonverbal communication were investigated when making these choices to convey the proper messages to the audience. For this production I also examined historic dress and dressmaking of the period and replicated this for the stage. The completion of actual garments required learning a variety of new skills ranging from cutting and draping fabric, to tailoring and stitching, which had to be researched to accurately represent the fashion of the period. By examining construction techniques of the period, I was be able to gain a further understanding of hands-on costuming as well as historic context for society and culture in Russia at the Turn of the 19th Century.

Puppet Creation for Second Shepherd's Play

Katherine Patterson (Theatre Arts, Undergraduate)
Faculty Mentor: Andrea Varga (Theatre Arts)

For this creative research project, I designed, constructed and maintained puppets for the Theatre Department fall 2012 production of Fat Ram: An Adaptation of The Second Shepherds Play translated and adapted by Professors Dan Kempton and Stephen Kitsakos. This play was a challenge to design. It incorporated many distinct settings, which necessitated not just multiple puppets, but a variety in aesthetics and mechanics. The first section of the play is set in the present-day and required puppets modeled after Jim Henson style muppets. The second section is set in medieval Europe and The Far East and necessitated realistic animal puppets, some of which stood by themselves and others, which were worn/manipulated by actors. Collaboration between the director, design team and puppeteers was a crucial part of this project to create a unified design look and practical function on stage. The different looks and usability of the puppets created a challenge to experiment with, and expanded my construction techniques. The primary objective was to design and construct the final dressing of the puppets, which involved foam sculpting and fur and fabric sewing. In total, four muppet style puppets, one free-standing ram puppet, and a two-person life size camel puppet were completed. The production provided an invaluable learning experience. It taught me problem solving, collaboration and research skills that I will to put to use in my future career as a special affects artist.

Costume Design and Illustrations for Eugenia

Rachel Townsend (Theatre Arts, Undergraduate)
Faculty Mentor: Andrea Varga (Theatre Arts)

The purpose of my research was to design the costumes for the SUNY New Paltz production of Eugenia written by Lorare Parry. The story is set in New Zealand and takes place in two time periods, 1915 and the present. In order to create a realized production, I had to first research the time periods and locations. The actors play multiple characters that exist in both the past and present, and so certain costume pieces had to be able to function in a way that facilitated a smooth transition between the time periods. The characters in 1915-1916 are New Zealanders and Italian immigrants, which presented an opportunity to show visual cultural differences. Additionally the story focuses on the real-life experiences of a transgender person and the woman he loved, presenting opportunities for creating gender & cultural stereotypes in clothing. The contemporary characters represent conflicting ideas and values surrounding gender and sexuality, therefore their costumes illustrate these personality differences. In collaboration with the other production designers and the director, I created a costume concept and supporting research collages. After this was complete, I created a series of design illustrations for each character in their costumes. Working with a team that included assistants, a costume shop manager, stitchers and a wardrobe team in the SUNY New Paltz Costume Shop, we created realized costumes for the production that appeared on stage in Parker Theatre in March 2012.

Publication Opportunities for Undergraduates

Valley Humanities Review is currently seeking essays in the humanities for publication in its Spring 2010 Issue. Please visit http://www.lvc.edu/vhr for more information.

Stanford Undergraduate Research Journal is an annual peer-reviewed publication of research articles written primarily by Stanford undergraduates, but also well-qualified students at other institutions, from all academic fields. http://www.stanford.edu/group/journal/index.html

Pittsburgh Undergraduate Review PUR is a multidisciplinary journal that accepts papers from around the world. http://136.142.181.181/~pur/index.php

Undergraduate Journal for Global Business and Community, offers undergraduate students a venue for publishing works http://jgbc.fiu.edu/index.html

The Dialectics Undergraduate Journal of Leadership, Politics, and Society aim is to promote undergraduate discourse and scholarship and to encourage students to pursue and engage in thoughtful discourses on topics of societal importance.
http://www.abington.psu.edu/dialectics/index.html

Pi Sigma Alpha Undergraduate Journal of Politics built a reputation for publishing outstanding research by undergraduate students. http://web.ics.purdue.edu/~psalpha/journal/call.html

Issues in Political Economy is committed to supporting and encouraging quality undergraduate research in all areas of economics. http://www.elon.edu/e-web/students/ipe/journalinfo.xhtml

Undergraduate Economic Review aimed at promoting high quality undergraduate research
http://titan.iwu.edu/%7Eecon/uer/index.html

Critique provides a forum for graduate and undergraduate students of politics to express and exchange diverse ideas and to imagine new possibilities for democracy and justice
http://lilt.ilstu.edu/critique/default.htm

Michigan Journal of Political Science The Michigan Journal of Political Science (MJPS) is one of the premier undergraduate political science journals in the country. http://www.umich.edu/~mjps/

Journal of Science and Health at the University of Alabama - JOSHUA includes topics with societal or ethical implications, emerging methodologies or fields, et cetera.
http://www.bama.ua.edu/~joshua/index.htm

The Penn Bioethics Journal is the nation's premier peer-reviewed undergraduate bioethics journal.
http://bioethicsjournal.com/about.html

BIOS to publish their undergraduate biology work http://www.tri-beta.org/publish.html

IMPULSE is the first international, online neuroscience journal for undergraduate publications.
http://impulse.appstate.edu/

The Indiana Undergraduate Journal of Cognitive Science invites submissions of original writing by undergraduate students. Submissions may come from any area within Cognitive Science http://www.cogs.indiana.edu/icogsci/instructions.html

Undergraduate Research Journal for the Human Sciences The URC Undergraduate Research Journal is an annual online national, reviewed journal dedicated to the publication of undergraduate student research. The twofold purpose of the journal is to foster and reward the scholarly efforts of undergraduate human sciences students as well as to provide a valuable learning experience. http://www.kon.org/CFP/cfp_urjhs.html

Journal of Psychological Inquiry We are proud to be one of the few journals to accept contributions exclusively from undergraduate students. http://jpi.morningside.edu/index.htm

The Undergraduate Psychology Journal (UPJ) at the University of California Los Angeles is a publication which features outstanding research work performed by undergraduate students at UCLA and around the country http://www.studentgroups.ucla.edu/upj/

The Yale Review of Undergraduate Research in Psychology is an annual journal that showcases the best and most original research in psychology conducted by undergraduates from around the world. http://www.yale.edu/yrurp/

Psi Chi Journal of Undergraduate Research a national, fully reviewed, quarterly journal dedicated to the publication of undergraduate psychology student research. http://www.psichi.org/pubs/journal/default.aspx

Caltech Undergraduate Research Journal
http://www.topgrad.com/caltech_undergraduate_research_journal.htm

The Caltech Undergraduate Research Journal (CURJ) publishes the best undergraduate research submissions from around the world in the form of science news and feature articles.

Journal of Young Investigators JYI's web journal (which is also called JYI) is dedicated to the presentation of undergraduate research in science, mathematics, and engineering. http://www.jyi.org/about/

Morehead Journal of Applicable Mathematics MEJAM accepts papers which are outside the realm of the typical undergraduate curriculum and which emphasize the applicability of mathematics while maintaining significant mathematical interest. http://www.moreheadstate.edu/mejam/index.aspx?id=5096

Rose-Hulman Undergraduate Mathematics Journal is devoted entirely to papers written by undergraduates on topics related to mathematics http://www.rose-hulman.edu/mathjournal/index.php

National Undergraduate Research Clearinghouse Any scientific manuscript. They can be empirical studies or literature reviews. http://www.webclearinghouse.net/help.php

Journal of Undergraduate Chemistry Research is a new peer review journal that will be published quarterly with papers of original research performed by undergraduates. http://www.vmi.edu/show.aspx?tid=36955&id=2214&ekmensel=8f9c37c3_156_160_2214_3

Journal of Undergraduate Research in Physics is a peer-reviewed journal of the Society of Physics Students (SPS) for archiving research conducted by undergraduate physicists. http://www.jurp.org/call_for_papers.html

The Journal of Undergraduate Research in Physics (JURP) is a peer-reviewed, online journal of the Society of Physics Students (SPS) and Sigma Pi Sigma, the physics honor society http://www.jurp.org/about_jurp.html

American Journal of Undergraduate Research A refereed journal for undergraduate research in the pure and applied sciences, mathematics, engineering, technology, and related areas in education. http://www.ajur.uni.edu/

Catalyst: Rice Undergraduate Science and Engineering Review http://catalyst.rice.edu/ Submissions for reviews will be accepted from undergraduate students who have performed science or engineering research at any international university or research institution laboratory.

History Matters: An Undergraduate Journal of Historical Research http://www.historymatters.appstate.edu/index.html

The Allegheny Review, now going into its 27th year of publication, is one of America's few nationwide literary magazines dedicated exclusively to undergraduate works of poetry, fiction, creative nonfiction, and art http://webpub.allegheny.edu/group/review/info.html

The Oswald Review An International Journal of Undergraduate Research and Criticism in the Discipline of English http://www.usca.edu/english/pubs/oswald/oswald.html

Young Scholars in Writing: Undergraduate Research Young Scholars in Writing: Undergraduate Research in Writing and Rhetoric, a peer-reviewed journal for undergraduates.

http://cas.umkc.edu/english/publications/youngscholarsinwriting/index3.html

Undergraduate Journal of Service Learning and Community-Based Research http://www.bk.psu.edu/Academics/33679.htm.

AnthroJournal is an open source journal of outstanding scholarly research papers and reports authored primarily by undergraduate and graduate college students. http://www.anthrojournal.com/

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Steven Difalco Biology 2013 Mentor: David C. Richardson, Biology
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Michael Marone Biology 2011 Mentor: Megan Ferguson, Chemistry
Pseudomonas putida and Cell Hydrophobicity

Valerie Werder English, Visual Arts 2011 Mentor: Cyrus Mulready, English
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Kyle Mcdonald Physics 2013 Mentor: Amy Forestell, Physics
The Characterization of Charge Coupled Devices

Claire Papell Women's Studies 2010 Mentor: Karl Bryant, Sociology
Advocacy Frames of Childhood Gender Nonconformity

Fall 2011 AYURE Award Recipients

Marissa Magerkurth-Biology 2012 Mentor: Jeff Reinking, Biology
Using differential scanning fluorimetry to identify nuclear receptor ligands.

Anna S. Anandan- Biology/Philosophy 2012 Mentor: Spencer Mass, Biology
Effects of Vinclozolinon Planarian Regeneration

Thomas Donovan-Physics/Mathematics 2012 Mentor: Richard Halpern, Physics
Improving Signalto noise ratio while optimizing probe access in a Faraday cage

Alison Pletch-Chemistry 2012 and Laura Hollenbeck-Biology 2012 Mentors: Preeti Dhar, Chemistry and Hon Ho, Biology
Fungicidal effects of Terminalia arjuna extracts on plant pathogenic fungi

Jessica Mason-Biology 2013 Mentor: Jason Valens, Biology
Microbial Ecology of Anoxic Zones in Coral Reef Live Rock

Hashim Al Mashat-Chemistry 2012 Mentors: Preeti Dhar, Chemistry and Aaron Haselton, Biology
Nicotine analogues: Phenyl azetidines andazetidinones as potential insecticidal agents

Jason Zanfordino-Psychology 2012 Mentor: Douglas Maynard, Psychology
A meta-analysis of underemployment-job outcome relationships

Carrie Sauer-Industrial/Organizational Psychology 2012 Mentor: Douglas Maynard, Psychology
Perceptions of and reactions to over qualification among high-and low-narcissism employees

Tanya Monique Crane-BFA Metal 2012 Mentor: Myra Mimlitsch-Gray, Art
Exploring New Possibilities for Liquid Enamel on Welded Metal

Katherine Patterson-Theatre Arts 2012 Mentor: Andrea Varga, Theatre Arts
Puppet Development and Construction for Fat Ram

Kyle Fassett-Technical Theatre 2012 Mentor: Andrea Varga, Theatre Arts
Fierce to Farouche: Russian Garb through Chekhov's Three Sisters

Meredith Henshaw-Economics 2012 Mentor: Sara Hsu, Economics
A Comparative Study of Sustainable Development in Taiwan and China

Spring 2012 AYURE Award Recipients

Laura Zaoutis -Mathematics 2013 Mentor: Natalie Cartwright, Mathematics
Mathematics and Rainbows: A Study of Special Functions

Corinna Ridgeway- Biology 2012 and Michael Minicozzi -Biology 2012 Mentor: Spencer M. Mass, Biology
Tamoxifen rescues planarians from the toxic effects of 4-Octylphenol

Katherine Patterson-Theatre Arts /BFA Printmaking 2012 and Keri Sheheen-BFA Printmaking/Film and Video Studies 2013 Mentor: Aleánna Luethi-Garrecht, Art / Graphic Design
Pop-up! An Exploration from Narrative to Construction

John Willemse-Art Education 2012 and Helen Gutfreund-Art Education 2012 and Stephen Protoss-Art Education 2012 Mentor: Beth Thomas, Art Education
Studio Research as Curriculum Development

Kathleen Westervelt-Chemistry 2015 and Adam Rimawi-Biology 2015 Mentor: Pamela St. John, Chemistry
The denaturation of DNA in the presence of a surfactant

Samantha Carraror-Psychology/ Studio Art 2013 Mentor: Corwin Senko, Psychology
How Abstract vs. Concrete Thinking Influence Student Achievement

Rachel Townsend-Theatre Arts/ Film Studies 2012 Mentor: Andrea Varga, Theatre Arts
Costume Design and Illustrations for Eugenia: A production of the Theatre Arts Department

Kristen Gray-Communication Studies 2012 Mentor: Elizabeth Munz, Comm. and Media
The Transition to Grandparenthood

Carling Moore Political Science 2012 Mentor: Jeff Miller, Political Science and Int. Relations
New Anarchism

Colin R. Morrell-Physics 2012 and Luke Stover-Secondary Education: Physics 2013
Mentor Diego Dominici, Mathematics
Designing a record breaking solar car

Mary Schappert-Biology/ Chemistry 2012 Mentor: Spencer Mass, Biology
Isolation and characterization of an estrogen receptor gene in Dugesia tigrina

Tsering Dolma-Biology 2012 Mentor: Jennifer Waldo, Biology
Divalent cation stabilization of the Dad2 subunit of the Dam1 complex

Molly Purcell-Major Printmaking 2012 Mentor: Jill Parisi-Phillips, Printmaking/ Art Studio
Sculptural Papermaking with Asian, Western, and Local Fibers

Student Travel Award Recipients

Meredith Henshaw-Economics 2012 Lessons in Sustainable development for China and Taiwan at the Eastern Economic Association Conference in Boston, MA.

Colin R. Morrell-Physics 2012 and Luke Stover-Secondary Education: Physics 2013 Hudson River Undergraduate Math Conference in Springfield, MA.

Tanya Monique Crane-BFA Metal 2012 Handwerk and Design Conference in Munich, Germany.

Shaun Ben-Ari-Chemistry 2012 ACS National Meeting Poster Presentation in San Diego, CA.

Katherine Patterson-Theatre Arts 2012 Presenter at the United States Institute for Theatre Technology Conference in Los Angeles, CA.

Helen Gutfreund-Visual Arts Education 2012 Presenter at the NAEA National Convention in New York, NY.

Michael Minicozzi-Biology 2013 Presenter at Northeast Regional Meeting of the Society of Developmental Biology in Falmouth, MA.

Carling Devin Moore- Political Science 2012 Presenter at the New England Political Science Association Conference in Portsmouth, NH.

Anna Anandan-Biology 2012 Presenter at the Northeast Regional Meeting of the Society of Developmental Biology in Falmouth, MA.

Corinna Ridgeway-Biology 2012 Presenter at Northeast Regional Meeting of the Society of Developmental Biology in Falmouth, MA.

Kyle Fassett- Theatre Arts 2012 Presenter at the United States Institute for Theatre Technology Conference in Los Angeles, CA.

Rachel Townsend- Theatre Arts/ Film Studies 2012 Presenter at United States Institute for Theatre Technology Conference in Los Angeles, CA.

Students accepted for the National Conference on Undergraduate Research- Ogden College, Weber UT. Raneen Rahhal (Biology), Melissa Douville (Linguistics & World Languages), Carrie Sauer & Elena Brondolo (Psychology), Doug Maynard (Mentor), Juan Canales (Linguistics & World Languages) Not in attendance: Maxwell Kenney (History), Deborah Schram (Linguistics & World Languages),

Notes: