



**7TH ANNUAL
UNDERGRADUATE
SYMPOSIUM FOR
SCHOLARLY AND
CREATIVE WORK**

Sponsored by the
Vice Provost for Academic Programs and the
Vice Provost for Research

**Arts
Humanities
Life Sciences
Social Sciences
Physical Sciences & Engineering**

APRIL 13, 2005

UNDERGRADUATE SYMPOSIUM FOR SCHOLARLY & CREATIVE WORK

SCHEDULE OF EVENTS

Tuesday, April 12, 2005

Symposium Judging

9:00 am – 5:00 pm

Davidson Conference Center

(Judges only--closed to presenters and general public)

Wednesday, April 13, 2005

General Presentations, Exhibits, and Displays

11:00 a.m. - 2:00 p.m.

Trousdale Parkway & Career Planning & Placement Center

Awards Ceremony & Reception

3:00 p.m. – 5:00 pm

Tyler Prize Pavilion



April 13, 2005

Dear Members of the USC Community:

It is my pleasure to welcome you to USC's 7th Annual Undergraduate Symposium for Scholarly and Creative Work. The Symposium is designed to provide USC undergraduates with the unique opportunity to exhibit and share examples of their significant research, scholarly and creative work with the university community. Although the Symposium is modeled on a professional conference poster session, students may exhibit their work in a variety of ways, such as through posters, art exhibits, and electronic media. All undergraduates are encouraged to participate. An award ceremony recognizing the most outstanding works will take place at the end of the symposium and includes First Prize awards of \$500 and Second Prize awards of \$250 in each of the following categories.

- Arts
- Humanities
- Social Sciences
- Life Sciences
- Physical Sciences, Mathematics & Engineering

A panel of distinguished faculty will judge submissions in each category. After the judging, you are cordially invited to attend the Award Ceremony in Tyler Prize Pavilion at 3:00 p.m. where the winners will be announced.

We hope you enjoy USC's Undergraduate Symposium, which promises to be a highlight of the semester this year and in many years to come.

Sincerely,

Lloyd Armstrong, Jr.
Provost

The USC Undergraduate Symposium for Creative and Scholarly Work provides undergraduates with the unique opportunity to exhibit and share examples of their significant research and creativity with the university community. This year, we have received almost 100 submissions with participation from over 150 students. Students present work in a variety of ways, such as through poster/panel sessions, art exhibits, and electronic media. All undergraduates are encouraged to participate. For some students, the symposium serves as a culmination of work they have produced in partial fulfillment of a senior honors project, or a research project with faculty, both individually and as part of a program.

ACKNOWLEDGEMENTS

On behalf of the Office of Undergraduate Programs and the Office of the Provost, we graciously thank USC faculty judges for volunteering their time. The success of the undergraduate symposium is largely due to the contribution of their expertise in the judging process. We would also like to give special thanks to the staff at the Career Planning and Placement Center for hosting all web and audio-visual submissions again this year. Thanks also to the USC Trojan Knights for their faithful service. Finally, thanks to the faculty advisors who have sponsored students in this year's Symposium. Your dedication to embrace teaching through inquiry-based learning has made this event as successful as it has been.

THANK YOU!!!

7th Annual Undergraduate Symposium for Scholarly and Creative Work

Table of Contents

SCHEDULE OF EVENTS	ii
LETTER FROM PROVOST ARMSTRONG	iii
WHAT'S IT ALL ABOUT.....	iv
TABLE OF CONTENTS	v
ARTS	1
HUMANITIES.....	3
LIFE SCIENCES	8
PHYSICAL SCIENCES & ENGINEERING	20
SOCIAL SCIENCES	32
INDEX OF PARTICIPANTS.....	56
INDEX OF PARTICIPANTS BY CATEGORY.....	59



Category: Arts
Name: Renee Martin
Submission Type: individual
Faculty Sponsor(s) & Department(s):
Julia Paull, School of Fine Arts
Photography
Format: Creative Work
Title: Habeas Corpus
Abstract: A photographic and video based artistic investigation of the ethics, morals and political practices surrounding unidentified bodies in Los Angeles County. This work explores themes of compassion, empathy, and policy in relation to socioeconomic structures and seeks to generate a discourse around these often difficult and controversial subjects. The work includes video, photographic images text and ephemera collected throughout the course of the "investigation."

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Category: Arts
Name: Julianne Gale

Submission Type: individual
Faculty Sponsor(s) & Department(s):
Allen Rucker, CTPR
Format: Creative Work
Title: Because of Emily
Abstract: Created in the style of "Guerilla Television," this documentary examines transgender identity and culture. Through interviews with both transgender and straight people, it illustrates the struggles, confusion, and common (mis)understandings of the trans community.

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Category: Arts
Name: Gershom Payzer, Robert Lydecker
Submission Type: group
Faculty Sponsor(s) & Department(s):
Massoud Ghyam, Computer Science
Format: Creative Work
Title: Gersh Fox II
Abstract: Gersh Fox II is an interactive, two dimensional, side-scrolling shooter. In the game, the player takes on the role of a maverick fighter pilot, by the name of Gersh Fox and attempts to save the universe.

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Category: Arts
Name: Sophie Tusler
Submission Type: individual
Faculty Sponsor(s) & Department(s):
Robbert Flick, Fine Arts
Format: Creative Work
Title: Untitled Nudes
Abstract: These photographs explore the experience of photographing and

being photographed in an intimate situation. The use of nudity is meant to attract attention to the subjects' facial expressions and mannerisms. This project is meant to question the relationship between photographer and photographed as well as the use of on and off camera spaces. The viewer is meant to step away from the photographs and feel a sense of familiarity, yet the scenes are obviously composed and invented.

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Category: Arts

Name: Paul Spaeth

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Morten Lauridsen, Thornton School,
Composition Dept.

Format: Creative Work

Title: Passacaglia: for Piano and Cello

Abstract: A passacaglia is a piece based on a repeating melodic line, usually in the bass. This is essentially a "double passacaglia" with both a reoccurring bass and melody line, which interact on many levels including harmonically. Stated very simply in the beginning, the passacaglia line journeys through many expressions, with the two coming together finally at once at the climax, only to disappear again into a cold, obscure distance.

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Category: Arts

Name: Lindsay Oman

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Everette Kane, Intermedia Studio

Format: Creative Work

Title: Technological Dystopia

Abstract: The windmill farms in Palm Springs is one of the largest in the nation and provides energy to the surrounding Los Angeles area. However, the massive form of technology that invades the beautiful desert landscape serves as a visual irony. Technological utopia is achieved as the perfectly organized rows of brilliantly white windmills pervades the serene mountainous background. The windmills serve as a symbol of clean energy and the technological progression of man to help sustain the nature in which they coexist. However, as one drives along highway 5 with the intent of enjoying a scenic route, the more that 40,000 windmills serve as a distraction to the desert beauty, creating a sense of technological dystopia.

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Category: Arts

Name: Kym Valvieja

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Karen Koblitz, Fine Art-Ceramics


Format: Creative Work

Title: Ceramic Teapot and cups

Abstract: This teapot is a traditional serving vessel. The lace design depicts "women's work" that has been done for centuries. This lace has been used to decorate clothes from the working people to the highest church officials. It has never been seen as fine art, but is most beautiful and complex in design. This piece is dedicated to all the women that have spent their lives caring for and supporting their families and in doing so, many times, forfeited hopes, dreams, desires and most of all personal identity.

CATEGORY

Humanities



Category: Humanities
Name: Adam Shahbaz
Submission Type: individual
Faculty Sponsor(s) & Department(s):
Alice Gambrell, English and African
American Studies
Format: Creative Work
Title: The Gleaners
Abstract: I consider this story "creative non-fiction" as certain events throughout actually occurred. However, characters names have been changed. Certain points have been exaggerated or embellished, and often simply fabricated. On a grey-scale I suppose the work falls more closely to fiction. Furthermore, the narrative incorporates philosophies and allusions gathered from authors that I have been particularly influenced by such as Whitman and Lawrence.

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Category: Humanities
Name: Kassimir, Spencer, Mu Sun
Submission Type: group
Faculty Sponsor(s) & Department(s):
Bruce Zuckerman, Religion
Format: Field Research
Title: Written in the Pavement
Abstract: While walking down Hoover towards 32nd street on my way to class, I saw that someone had the nerve to carve a swastika into the ground right in front of Hebrew Union College. For a while, I stood there and just looked at it wondering what type of person would do such a thing. I then looked around and noticed that there were more than just Jewish establishments such as Hebrew Union, Hillel, and Chabad in the near area but also Christian churches of multiple denominations, a Mosque, and USC which is the most internationally diverse school in the country. Thus, I was compelled to make a documentary in the hopes of finding how different figures both religious and academic in this community felt effected personally or globally by this assault.

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Category: Humanities
Name: Kate Revill, Christine Hasircog, Melissa Blaschke, Grace Sauder
Submission Type: group
Faculty Sponsor(s) & Department(s):
Lynn Swartz Dodd, Religion
Format: Creative Work
Title: Research of Year One
Tetradrachm
Abstract: This research project uses coins as a means of reflecting on ancient and modern Jewish identity, aspirations and history. This study is a close

reading of the features of a single coin from the collection of Alan Casden, USC Trustee. Our focus in this project was to determine the relationship between the original legal tender Roman coin and the illegal Year One tetradrachma overstrike. Our research identifies the iconography and symbolism on this coin and relates these to the political and social situation of a Roman province in revolt. We also investigate the persistence of meaning of the symbols on this coin, such as the temple and the ark of the covenant, and the de-figuring of the Roman coin defaced in the creation of the Jewish coin. Using new high resolution photographic images recently made of this coin, we are able to suggest candidates for the coin that was used as the basis for this Roman period Jewish coin.

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Category: Humanities
Name: Sepideh Eshaghian
Submission Type: individual
Faculty Sponsor(s) & Department(s): Professor Bruce Zuckerman, School of Religion
Format: Field Research
Title: Simon Bar Kokhba: Second Revolt, Year 3 Coin
Abstract: This project analyzes the Simon Bar Khokba bronze coin which dates to 135 A.D. The Jewish revolt was led by Simon Bar Kokhba. Both front and back of coin are covered with Jewish iconography that symbolizes the Jewish culture and the spirit of the revolution. Through the coin, one can discover the political climate of the

region as well as the culture of both the Jewish and Roman nation. The coin also gives one a window into the reasons behind coins and how they are made. While the coin has not been perfectly maintained, its imperfection reveals a great deal about the time in which this coin was used.

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Category: Humanities
Name: Ebonee Harden
Submission Type: individual
Faculty Sponsor(s) & Department(s): Judith Jackson Fossett, English and African American Studies
Format: Field Research
Title: The Black Expatriate in Paris: Then and Now
Abstract: The objective of this research is to explore the theme of African American expatriation and it's theme in black political thought, most especially African Americans expatriate relationship to France. From Josephine Baker, Richard Wright, Gordon Heath, and James Baldwin to modern Black expatriates like Janet McDonald and Faith Ringgold. In evaluating this history I hope to develop some answers for the following questions: What is it that makes Blacks want to leave the US for France? What type of Blacks does the expatriate lifestyle attract? How have the reasons to choose expatriation changed over time? How does gender and sexuality fit into the expatriate community? Are distinctly African American cultural connotations transplanted or redeveloped in these communities?

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Category: Humanities

Name: Anna Bokarius, Elizabeth Busfield, Sara McDonald

Submission Type: group

Faculty Sponsor(s) & Department(s):

Jolanta Aritz, Marshall School of Business

Format: Field Research

Title: Linguistic Patterns in Gender and Business

Abstract: It has been proposed by sociolinguists that speech patterns employed across genders may have historically caused women to play a subordinate role in the professional sphere. Sociolinguist Janet Holmes (1995) has found that in a professional conference setting in New Zealand men tend to display more dominant speech patterns, such as interruptions and critical or antagonistic questions. This linguistic behavior is empowering because interruptions allow the speaker to take over a turn, while antagonistic questions allow the speaker to challenge someone else and assert his or her own knowledge and power.

In an effort to test these findings in a simulated business setting, we performed a replicate study and analyzed mock businesses presentations videotaped at the USC Marshall Business School using Transana software, for the transcription and qualitative analysis of the data. Our study has confirmed previous findings. In addition to replicating the study, we also compared the communicative behavior in formal versus informal settings and have found that women use

more empowering linguistic tactics in informal speech than they do in formal. Moreover, we observed that status of the speaker tends to play a less important role than gender in business conversations. Our study therefore confirms previous findings and raises new questions.

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Category: Humanities

Name: Marcia Ciccone

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Bruce Zuckerman, Religion; Lynn Swartz Dodd, Religion

Format: Creative Work

Title: Shekel of Israel: A Commemoration in Silver

Abstract: Under Roman rule in the 1st Century C.E., the people of Judea staged their first revolt in 66 C.E., fending off the Romans for an impressive span of five years before Titus, son of the Emperor Vespasian, crushed their rebellion in 70 C.E. During the uprising, the Jewish people minted coins as a means of declaring their independence from the empire; thus, the symbols and inscriptions on the coins reflect the nationalistic goals of the revolt. Because the Jews were required to pay their temple taxes in high-quality silver, the period produced a series of beautiful shekels and half-shekels, each decorated with a chalice, a branch of three pomegranates, nationalistic slogans, the denomination of the coin, and the year each was minted. The collection at USC's archaeology lab contains one of these shekels, dating from year three of the first revolt, which I have analyzed, using high-resolution photography, in

order to compare it to other photographs of Jewish shekels minted in the same year. This comparison, based mainly on the coins' paleography, sought to find another coin struck with the same die. One may also note that the coin in the collection is of particularly fine quality, very well preserved for its age, so I attempted to uncover the coin's history, including details such as its place of discovery and previous owners, with the intent of finding out how it remained so pristine.

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Category: Humanities
Name: Sameer Asad
Submission Type: individual
Faculty Sponsor(s) & Department(s): Megan Reid, Religion
Format: Creative Work
Title: Islam and Hip Hop
Abstract: My project "Islam and Hip Hop" deals primarily with the connection found between the religious tradition and the cultural phenomenon. Combining elements of both a historical and cultural approach, my study revolves around the striking similarities found between Islamic poetry and Hip Hop. More specifically, the study analyzes the Islamic poetic duel with the contemporary Hip Hop battle using Abu Nawas and Nas as a test case. Abu Nawas, an appraised poet of the Islamic Empire, triumphed in the scorn genre poetry which allowed him to defame and ridicule his opponents through his lyrical talent. Likewise, as seen with the 2001 feud between Jay-Z and Nas, a similar dialectic is echoed. Though over a span of several centuries, these two artistic expressions have managed to share a

tradition of protest and critique through their performance.

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Category: Humanities
Name: Daylen Riggs, Jason Adams
Submission Type: group
Faculty Sponsor(s) & Department(s): Dani Byrd, Linguistics; Sungbok Lee, Linguistics/Electrical Engineering
Format: Laboratory-based Research
Title: Interacting Effects of Syllable and Phrase on Consonant Production
Abstract: The complexities of how prosodic structure (i.e., the organization of speech sounds), shapes speech production have begun to be illuminated through studies of articulation. Here we pursue the long-term goal of understanding prosodic signatures on articulation by examining the effects of phrasal and syllable position on the production of consonants. Articulatory kinematic data were collected for five subjects using electromagnetic articulography (EMA) to record target consonants of three types (labial, labiodental, & tongue tip), located in (1) either a syllable final or initial position and (2) either at a phrase edge or phrase medially. The duration, displacement, and time-to-peak velocity of articulator constriction formation and release were determined for the target consonants based on kinematic landmarks in the articulator velocity profiles (zero-crossings & extrema). Crucially, we evaluate the interaction of phrasal and syllable position to determine whether these spatiotemporal properties of onsets and codas are similarly affected by phrase boundaries. In addition to

independent main effects of prosodic context, ANOVA results indicate a crucial interaction between phrasal and syllable position. [Work Supported by NIH and USC.]

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CATEGORY

Life Sciences

Category: Life Sciences

Name: Jennifer Yamtich

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Kathy Ann Miller, Biology; Jed Fuhrman, Biology

Format: Field Research

Title: The Status of Island Scrub Oak on Santa Catalina Island

Abstract: The island scrub oak, *Quercus pacifica*, is an endemic to the Channel Islands that has recently suffered from a widespread die-back on Santa Catalina Island. The exact cause of the dieback is unknown, but possible factors include a root-rot fungus, air pollution from Los Angeles, herbivory by feral goats and pigs, or a combination of the above factors. My work followed up on a 2001 study by the Catalina Conservancy which established scrub oak monitoring plots. Three plots were surveyed on the east end of the island where all herbivores but deer and bison have been removed since 2001, and four sites were on the west end where all but deer have been removed since the mid to late

1990s. At each plot surveyed, the age class, health, and basal diameters of each tree were recorded. For seedlings and saplings, their association with annual grasses, substrate and location under cover or in the open was recorded, as well as their height and diameter of sapling stems. Compared to the 2001 study, live trees showed improved health with an increased density of basal sprouts. Most seedlings survived, and a few new seedlings were established. Of the 25 seedlings and saplings observed, 22 were found in one site, suggesting that restoration efforts should be focused on areas with limited natural regeneration. Also, seedlings were found to be healthier and more abundant under cover and not associated with annual grasses, suggesting that transplanted seedlings should be located in similar areas.

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Category: Life Sciences

Name: Ashiya Hamirani, Aaron Andrade

Submission Type: group

Faculty Sponsor(s) & Department(s):

Joseph Landolph, Department of Molecular microbiology, and Immunology, and Pathology

Format: Laboratory-based Research

Title: Genotoxicity and Carcinogenicity of Insoluble Nickel Compounds

Abstract: Nickel compounds have been correlated with increased incidences of lung and nasal cancer in nickel refinery workers in the past. Insoluble nickel compounds have been experimentally proven to be carcinogenic in previous studies. Our lab utilizes the 10T1/2 model culture system to execute

genotoxicity experiments to determine the carcinogenic potential of nickel compounds. The purpose of our study is to determine if the new samples, Inco 110 and Nickel Grinding Dust, are genotoxic. Results indicate that Inco 110 showed significant cytotoxicity and dose dependency with a maximum concentration of 3.0 micrograms/mL and an LC50 of 1.5 micrograms/mL. The Nickel Grinding Dust sample also showed appreciable cytotoxicity, but at much higher concentrations. It had a maximum concentration of 3000 micrograms/mL, and an LC50 of 500 micrograms/mL. Future experiments with these two samples will determine their phagocytic uptake and genotoxicities.

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Category: Life Sciences

Name: Anthony Phillips

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Michael Quick, Molecular Biology

Format: Laboratory-based Research

Title: Subunit Composition of Medial

Habenula and IPN Acetylcholine

Receptors

Abstract: The composition of neurotransmitter receptors has a large role in determining function of those receptors. If we can identify exactly what the composition of specific cell receptors is, we can better elucidate their function in brain. Therefore, our laboratory has researched the subunit composition of cells in the habenula and the interpeduncular nucleus. Using the reverse transcription polymerase chain reaction (RT-PCR) method, we measured the amounts of each subunits mRNA in

cells responsive to nicotine and cells unresponsive to nicotine. The hope is that we will find a correlation between subunit composition and responsiveness to nicotine. We found particular subunits that were always present in these cells, some that were present only sometimes, and some that were never present. We deduced from this that, expression of particular subunits (alpha3, alpha4, alpha5, beta2, and beta4), are necessary for the correct formation of the receptor. The subunits that are expressing only some of the time (alpha6 and beta3) must be non-essential for the formation of the receptor, but can still be included in some instances. Finally, we deduced that the subunits that were never expressed (alpha7 in IPN cells) are not used in the composition of receptor subunits of these cells.

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Category: Life Sciences

Name: Eugenio Santillan

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Kenneth Nealson, Earth Sciences; Radu

Popa, Earth Sciences

Format: Senior Honors Project

Title: Understanding the Genes Involved in Anaerobic Respiration for S.

oneidensis, MR-1

Abstract: The gamma-proteobacterium *Shewanella oneidensis* is an environmentally significant microbe capable of "breathing" rocks in the absence of oxygen. It has the ability to utilize many different electron acceptors for anaerobic respiration including iron, manganese, and nitrate. In addition, it has the potential for bioremediation because it is able to use toxic metals like

chromium and uranium as further electron acceptors. A complete genome sequence of *S. oneidensis* strain MR-1 has been achieved, however, most genes in this bacterium still contain unknown and unassigned functions. An understanding of the microorganism's physiology in relation to its genes is therefore a vital part to understanding the potential *S. oneidensis* has in the environment. This project examines the possible genes in *S. oneidensis* involved in utilizing various electron acceptors. Mutants were obtained containing specific deleted genes and were then tested under anaerobic conditions to determine which deletions were significant in anaerobic respiration.

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Category: Life Sciences

Name: Cindy Danielson

Submission Type: individual

Faculty Sponsor(s) & Department(s):
Daryl Davies, Molecular Pharmacology & Toxicology

Format: Laboratory-based Research

Title: Application of a New High-Throughput System to Study hPepT1 and Screen Compounds

Abstract: The human intestinal oligopeptide transporter (hPepT1) is responsible for the uptake of dipeptides, tripeptides, and some peptoid drugs from the intestinal lumen to the enterocyte cytoplasm where they are enzymatically modified for uptake into the systemic blood stream. Because of its ability to transport a wide variety of substrates, there is considerable interest in hPepT1 as a potential route for the uptake of orally delivered drugs and pro-drugs.

However, information about the structure of the protein, and especially the substrate binding site is lacking. To address this issue, the current investigation measured the transport of oligopeptide substrates by hPepT1 using *Xenopus* oocytes using a two-microelectrode voltage-clamp to characterize the mechanisms of transport. Oocytes were isolated from *Xenopus laevis* and injected with hPepT1 cRNA. A traditional and a high-throughput 8-channel two-electrode voltage clamp system (OpusXpress) were used. Oocytes were placed in a chamber and perfused with MBS at 2 mL/min. Membrane potential was held at -70mV , and Gly-Sar induced currents were measured at 11 voltage steps. We found that substrate transport characteristics were similar when compared from one to three trials. The time to reach reversible, steady-state currents was less than 1 minute. Moreover, maximal substrate transport was both proton and substrate dependent. The similar findings obtained on the benchtop and with the OpusXpress (when comparing the characteristics of substrate transport) indicate that the OpusXpress can be utilized to increase our ability to rapidly screen prospective compounds. (Support: USC URP, USC School of Pharmacy and NIAAA AA01392).

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Category: Life Sciences

Name: Josephine Tempongko

Submission Type: individual

Faculty Sponsor(s) & Department(s):
Daryl Davies, Molecular Pharmacology and Toxicology

Format: Laboratory-based Research

Title: Actions of HMTS on GlyR Function at Positions A52C and S267C

Abstract: Glycine receptors (GlyRs) are ligand-gated ion channels (LGICs) found in the CNS that are positively modulated by alcohol. However, the sites of alcohol action on GlyRs are poorly understood. In the past, methanethiosulfonate (MTS) reagents have been used as a pharmacological tool to characterize the action of alcohol on GlyRs. Previous studies report that a hexyl-MTS (HMTS) reagent covalently binds to cysteine residues introduced into a second transmembrane site at position S267C in GlyRs and irreversibly enhances receptor function. This action supports the notion that S267 may play a role in the action of alcohol. Studies from our laboratory suggest that position A52 may also play a role in the action of alcohol in GlyRs. The current study uses HMTS to extend our A52 studies. We investigated the effects of HMTS on positions A52C and S267C. *Xenopus laevis* oocytes were isolated and micro-injected with cDNA. The GlyR of wild-type, S267C and A52C mutants were tested using traditional two-electrode voltage clamp. We found: 1) HMTS has no effect on wild-type GlyRs, 2) HMTS has a positive effect on GlyRs at position S267C, and 3) HMTS has a negative effect on GlyRs at position A52C. The change in functional response of the mutant receptors supports the notion that HMTS is accessible to both receptors. However, the resulting difference in functional modification (potentiation versus inhibition) is consistent with the notion that the actions of alcohol at these two sites may differ. (Support: USC

URP, USC School of Pharmacy and NIAAA AA01392)

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Category: Life Sciences

Name: Jennifer Clark

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Frank Corsetti, Earth Sciences

Format: Laboratory-based Research

Title: Data Compression as a Geological Tool

Abstract: File compression is a standard tool for manipulating computer files so they are of a manageable size, but the potential for geologic uses of compression has been little explored. Compression algorithms recognize repeating patterns and encode for repetitions, resulting in a smaller file size. The amount of compression scales with the amount of randomness in a file: the more random, the less the compression. Therefore, compression provides a way to quantify the amount of randomness in a file. I will apply file compression to image files of rocks in order to quantify the amount of randomness with respect to mineral distributions. The three main categories of rocks (igneous, metamorphic, and sedimentary) will be examined using Lha compression. Perhaps the rocks with a more homogenous composition will be more redundant, allowing their image to be compressed greatly. I plan to test the hypothesis that metamorphic and sedimentary rocks, many of which have a preferred mineral orientation, may compress further than intrusive igneous rocks. On the other hand, it is possible that what appear as “regular” patterns to

us actually retain a significant amount of randomness. It is also possible that what appears random may indeed contain many repeating patterns. Thus, any results will help determine if the compression analysis is useful when applied to geologic materials.

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Category: Life Sciences

Name: Joseph Sabat

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Gary Rosen, Mathematics

Format: Laboratory-based Research

Title: Mathematical Modeling for a Transdermal Alcohol Sensor

Abstract: Monitoring alcohol consumption for patients and research subjects unobtrusively, passively, non-invasively, and accurately is a major problem for recovering alcoholics, practitioners, and researchers who need accurate field data for research or recovery programs. The Giner WrisTAS can measure transdermal alcohol excretion accurately. Mathematical models for the pharmacokinetics of ethanol (EtOH) in the human body, calibrated for each subject's ingestion, metabolism, and transdermal excretion, are required to understand how the amount of alcohol measured by the WrisTAS relates to Blood Alcohol Concentration (BAC) and ingested alcohol. The models include a full body compartmental model coupled to a diffusion model of the skin that models EtOH from ingestion to the device. In addition, three blood-to-skin models are created, which include a parabolic model, a hyperbolic model, and a porous media model. The parameters of each

model are set by having a subject consume a known amount of alcohol and recording BAC and sweat alcohol. Using the adjoint method of integration, the subject's parameters are estimated, defining the model. The WrisTAS is then worn in the field and subjects are instructed to record the amount of alcohol consumed and take BAC measurements regularly. Using the calibrated models and subjects' reported consumption and BAC, the models are tested to see if they produce the same output as recorded by the WrisTAS. Next, the models are mathematically inverted to see if the WrisTAS signal can be used to accurately predict the BAC and when and how much alcohol was consumed.

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Category: Life Sciences

Name: Kieumai Vo

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Suzanne Edmands, Biological Sciences

Format: Laboratory-based Research

Title: Hybridization between Genetically Differentiated Copepod Populations

Abstract: Although many studies of the intertidal copepod *Tigriopus californicus* have looked at the effects of hybridization, few have performed experiments that extend past the first or second generations. The present study considers the relative fitness of hybrid populations through the second and third generations to better understand the changes and effects of long-term hybridization. Replicated laboratory crosses between two genetically distinct populations from California (Royal

Palms and San Diego) were initiated and observed for components of fitness and morphology of the first, second, first generation backcross, and third generations at regular intervals. Although hybrids in each generation generally hatched as many offspring as the pure parental strains, the number of nauplii that survived to day 14 was markedly lower in F2 and F3 generations than in the F1 generation. Compared to the F1, the F2 generation exhibited a decrease in survival with an increase in variance. F3 survival was higher than F2; however, it was still below F1. The backcross generations had higher survival fitness than any of the generations, however, one replicate in the RP backcross did not generate any survivors altogether. Morphological measurements did not show much change between any replicates or generations. Thus, the results are illustrative, pointing out not only that fitness problems encountered in earlier generations may not have long-lasting effects, but that the full extent of outbreeding depression may not be fully realized until several generations of hybridization has occurred.

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Category: Life Sciences
Name: Karen Barnard
Submission Type: individual
Faculty Sponsor(s) & Department(s): Suzanne Edmands, Marine Biology
Format: Laboratory-based Research
Title: Incipient Speciation in the Intertidal Copepod *Tigriopus californicus*
Abstract: The copepod *Tigriopus californicus* can be separated into

northern, southern, and intermediate populations according to reproductive patterns. Two of these populations, Los Morros Colorados and El Cuervito, are of particular interest because they appear to mark the boundary across which the northern and intermediate populations are differentiating from the southern ones. In this study crosses were set up between these two populations to establish their placement within the reproductive groups. Fitness measurements were also made for the different crosses. In addition, the two populations were examined using mitochondrial sequences to examine their evolutionary history. The results established Los Morros Colorados as an intermediate population and El Cuervito as a southern population, since they showed an asymmetrical reproductive pattern. The F1 hybrids that did occur showed a significant decrease in fitness relative to the parental controls, while the F2 exhibited a comeback, with fitness not significantly different than the parental controls. In the future studies will be focused on determining the nuclear genetic differences between the two populations.

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Category: Life Sciences
Name: Melinda Wu, Akash Gupta, Raymond Jone, Patrick Popa
Submission Type: group
Faculty Sponsor(s) & Department(s): Albert Herrera, Neurobiology
Format: Laboratory-based Research
Title: The Role of Electrical Coupling in Synapse Elimination in *Xenopus laevis*
Abstract: During development, muscle fibers are innervated by excess motor

neurons. In *Xenopus*, this polyneuronal innervation can be both focal (multiple synapses per neuromuscular junction) and distributed (multiple junctions per fiber). Through synapse elimination, the excess synapses are pruned until the adult innervation pattern is achieved. In *Xenopus* adults, each muscle fiber has two junctions with one synapse each; the synapses are both from the same motor neuron. Previous research has shown synapse elimination to be activity dependent. Since electrical coupling between muscle fibers affects the pattern of activity at competing synapses, it is thought that gap junctions may influence synapse elimination. The aim of our project is to characterize the timing of gap junction appearance and disappearance and correlate it to the timing of synapse elimination. Our hypothesis is that gap junctions will be eliminated simultaneous with or prior to synapse elimination. The presence of gap junctions was tested in two ways. First, Lucifer yellow dye was iontophoretically injected into muscle fibers and fluorescence microscopy was used to see if dye spread to adjacent fibers, which could only occur via gap junctions. Secondly, the spread of current through gap junctions was directly tested by injecting current into one fiber and recording voltage changes in adjacent fibers. We have found the absence of gap junctions in tadpoles of developmental stages 61-66. Since synapse elimination occurs mainly between stages 59-61, our data are consistent with our hypothesis. Further research is needed on younger stages to identify the timing of gap junction disappearance.

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Category: Life Sciences

Name: Melanie Cheng

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Lorraine Turcotte, Kinesiology

Format: Laboratory-based Research

Title: Insulin Affects LCFA Metabolism via the PI3K Pathway in L6 Skeletal Muscle Cells

Abstract: While there is much data on insulin (I) metabolic regulation in terms of glucose uptake signaling pathways, cell signaling data on regulation of muscle long-chain fatty acid (LCFA) metabolism independent of glucose is unclear. LCFA metabolism of L6 myotubes incubated with [1-¹⁴C]palmitate with or without I were measured using LCFA kinetic parameters to determine whether I regulates LCFA metabolism independent of glucose. As expected, LCFA was found to regulate LCFA metabolism. Myotubes were then incubated with either the PI3K inhibitor wortmannin (W) or the PKB/Akt inhibitor to determine whether I acts via the PI3K-PKB/Akt signaling pathway. Basal LCFA uptake was found to increase linearly with time, from 1 to 60 min of incubation and increased in the presence of I. I (100 nM) significantly ($P < 0.05$) increased LCFA uptake and triacylglyceride synthesis (TGS) by 11-44% and significantly ($P < 0.05$) decreased LCFA oxidation by 50%. W prevented the insulin-induced increase in LCFA uptake and TGS and decrease in LCFA oxidation. None of the variables were affected by PKB/Akt inhibition, suggesting a direct effect of I on LCFA

metabolism in muscle cells occur via the PI3K pathway but not via the downstream signaling molecule PKB/Akt.

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Category: Life Sciences

Name: Nadia Hassan, Amanda Hiler, Ashley Wofford

Submission Type: group

Faculty Sponsor(s) & Department(s):

M. Lyon, Neuroscience

Format: Laboratory-based Research

Title: Increased Complexity of Time-Patterns and Impulsivity of Responding to a Noxious Stimulus in a Prenatal Stress Animal Model of Schizophrenia

Abstract: Introduction: Behavior of prenatally stressed rats as an animal model for schizophrenic behavior (Lyon and McClure, 1995), was tested using dopaminergic (DA) drugs affecting escape/punishment conditioning and resulting response time-patterns.

Methods: N=23, female, Sprague-Dawley rats were subjects. N=12 (PNS) had mothers exposed to immobilization stress on gestational days e11-e14, while N=13 (UNH) had unhandled mothers. Offspring performed a noise-escape tiltcage task using 95dB white noise. Escape and punishment responses and latencies were recorded. Response time-patterns were analyzed using THEME (Magnusson, 2000). Animals received three counterbalanced dose levels of DAD1 agonist (SKF38393) and indirect DAD2 antagonist (7-nitroindazole) at 48h 'wash-out' intervals. Results were statistically analyzed using SPSS methods. Results: PNS animals showed increased numbers,

and decreased latencies, of punished responses, which resembled 'impulsivity'. PNS animals also demonstrated greater complexity in both length and level structure of response time-patterns. SKF38393 normalized punished responses and complexity of behavioral time-patterns in PNS animals, but high doses produced subnormal responding in both groups. 7-nitroindazole produced either no change, or slight increase, in abnormal responding of PNS animals. The drug effects on time-patterns mimic findings in neuronal temporal firing patterns (Ikegaya et al., 2005) in the same medial prefrontal areas that are dysfunctional in both the prenatal animal model and in schizophrenia.

Conclusions: Failure to respond normally to punishment, increased number and complexity of time-patterns, and response to DA-related drugs in PNS animals resembled findings in human schizophrenic patients. Results imply possible correlations between THEME time-patterns and neuronal firing patterns in brain regions already implicated in schizophrenia.

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Category: Life Sciences

Name: Afshin Arianjam

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Sarah Hamm-Alvarez, Pharmaceutical Sciences; Ian Haworth, Pharmaceutical Sciences

Format: Laboratory-based Research

Title: Role of MHC II Molecules in the Development of Sjögren's Syndrome in NOD Mice

Abstract: Sjögren's syndrome (SjS) is an autoimmune disease characterized by symptoms of dry eye and dry mouth accompanied by lymphocytic infiltration of the lacrimal and salivary glands and the expression of autoantibodies to intracellular acinar proteins, including M3 muscarinic receptor and fodrin. Recent work has demonstrated that the lacrimal acinar cells can express major histocompatibility complex (MHC) class II molecules under certain conditions. One model for establishment of SjS suggests that the potential autoantigens may gain access and enter the endosomal/lysosomal pathway to bind MHC II molecules and initiate an autoimmune response. We sought to identify localization patterns of the M3 muscarinic receptor in the NOD mouse model of the disease in comparison to normal BALB/c mice. Our second aim was to determine possible MHC class II-associated antigenic peptides derived from SjS autoantigens, using a computational model of the I-Ag7 crystal structure. Thus far, our observations in lacrimal glands from NOD mice indicate a clear difference in localization patterns of the M3 receptor. We hypothesize that the M3 receptors of diseased mice show sharp concentrated signals within lysosomal cavities of the cell. Furthermore, by utilizing the known GAD peptide antigen, our computational results have eliminated unlikely antigenic peptide candidates, and in doing so our findings have identified numerous peptides from the M3 receptor as potential antigenic peptides responsible for the immune system response in SjS.

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Category: Life Sciences

Name: BJ Gill

Submission Type: individual

Faculty Sponsor(s) & Department(s):

C. Ted Lee, Chemical Engineering

Format: Laboratory-based Research

Title: Reversible DNA Binding of

Photo-responsive Surfactants

Abstract: A series of synthetic azobenzene photo-responsive surfactants that have potential as gene therapy vectors have been studied. These surfactants undergo a trans/cis conformation change depending on the wavelength of incident light they are exposed to. When exposed to visible light the surfactants take a hydrophobic, trans configuration, bind tightly to DNA, and condense the molecule. When exposed to ultraviolet light, the surfactants revert to a more hydrophilic cis conformation and separate from the DNA allowing it to return to its original elongated state. This discrete binding process has been demonstrated by fluorescent microscopy observations. In phase behavior experiments, DNA and surfactant concentrations were varied to find the phase boundary where the globule DNA/surfactant complex visibly precipitates out of solution. Phase boundaries for DNA/surfactant solutions exposed to UV light were found to be at notably higher surfactant concentrations, conclusively establishing the more hydrophilic nature of surfactants in the cis conformation. The effect of the addition of salt was also studied to show the contributions of electrostatic interactions. Taking advantage of different optical density of the clear and

precipitated solutions, the kinetics of the precipitation and dissolution processes induced by light changes was studied. Current experiments involve the use of dynamic LASAR light scattering in an effort to more accurately visualize conformational changes by studying changes in diffusion coefficient.

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Category: Life Sciences

Name: Dorothy Kwok

Submission Type: individual

Faculty Sponsor(s) & Department(s):
Radu Popa, Earth Sciences

Format: Laboratory-based Research

Title: The Effect of Magnetic Fields on Cell Tissues

Abstract: As biomagnetics increases in popularity, more people are turning to magnetic-based therapy as a solution to alleviate various body pains. The effects of magnetic fields, however, on specific biological activities are still unclear and require laboratory research. It is known that power frequency magnetic fields result in adverse effects on a growing embryo and fetus, which include neurochemical changes in tested chick embryos. Static magnetic fields inhibit the growth of several species of bacteria like *Escherichia coli* as well as the antibiotic activity of *Pseudomonas aeruginosa*. Given its extensive library of transposon-based mutants, the bacteria species *Shewanella* has a well-known proteome which may serve as a blueprint for gene expression. The aim of this study is to determine how a static or changing magnetic field affects six strains of *Shewanella*, in terms of overall growth and differences in protein production measured through the

fluorescence of Green Fluorescent Proteins (GFPs) inserted in various parts of the genome. In the future, we intend to investigate the effect of magnetic fields on a molecular level, to examine its effects on enzyme activity and protein performance, as well as the mechanism by which magnetic field treatments affect cell metabolism.

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Category: Life Sciences

Name: Ridhima Softa

Submission Type: individual

Faculty Sponsor(s) & Department(s):
Michael Quick, Neurosciences

Format: Laboratory-based Research

Title: Genestein, Bungarotoxin, and its Effect of Alpha 7 Receptors on Rat Neurons

Abstract: Alpha-7, a type of receptor on cells that bind to nicotine were allowed to proliferate on frog oocytes by injection of alpha-7 RNA. The effects of drugs such as Genestein and Vanadate were tested on this proliferation. The receptors were found to produce a bigger response in presence of Genestein and a lower response with Vanadate. This was tested through radioactivity experiments which detect the binding of nicotine to alpha-7 receptors. Radioactivity was also through Bungarotoxin, which binds to alpha-7 receptors. In other experiments, different concentrations of Genestein were exposed to the cells and radioactivity counted the receptors. Later, rat neurons replaced frog oocytes since the alpha-7 receptors are intrinsically present on neurons, so there is no need to inject the receptor RNA as in frog oocytes. Drugs like MLA, and hot and cold nicotine were tested to

observe the effect of proliferation both internally and externally on the cell.

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Category: Life Sciences

Name: Stephanie Bughi, Jennifer Sumcad

Submission Type: group

Faculty Sponsor(s) & Department(s): Stefan Bughi, Division of Endocrinology

Format: Field Research

Title: Prevalence of Stress Among Medical Students from Southern California

Abstract: Stress is common in medical students, and was reported to affect both physical and mental health. AIMS: To assess: 1) the prevalence of stress among 3rd and 4th year medical students (MS) and 2) the effect of brief behavioral intervention program (BBIP) on stress management. METHODS/PATIENT POPULATION: The SS level was determined by using the General Well Being Scale (GWBS), the score ranges from 0 to 110. A stress score above 72 indicates positive well-being (PWB), a score below 72 represents stress (SS), and below 60 indicates distress (DS). The MS' stress level was measured prior to their psycho-educational lecture on stress. The study group included 93 MS, 49 female and 44 male students. Eighteen MS were tested before and after the implementation of BBIP. RESULTS: The 43/93 students (46.2%) who reported SS/DS experienced significantly higher levels of anxiety, depression and decreased PWB. Female students reported higher level of anxiety compared to their male colleagues (13.1+/-4.6 vs. 15.4+/-4.6, p<0.05). Among MS involved in the BBIP,

stress/distress was present in 8/18 (44.5%) before the program, and in 4/18 (28.6%) after the program, a 64.3 % decreased. CONCLUSION: 1) Stress is very prevalent among MS. 2) The MS who reported SS have a significantly higher level of anxiety and depression compared to those who reported PWB.3) Female students reported a higher level of anxiety compared to their male colleagues, 4). The implementation of BBIP decreased the prevalence of stress by 64.3%. Increase awareness of stress, and early intervention may prevent burnout and improve healthcare delivery.

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Category: Life Sciences

Name: Howard Harris

Submission Type: individual

Faculty Sponsor(s) & Department(s): Kenneth H. Nealson, Department of Earth Sciences; Radu Popa, Department of Earth Sciences

Format: Laboratory-based Research

Title: Screening Deletion Mutants for Optimizing Microbial Fuel Cells

Abstract: Microbial Fuel Cells (MFC) provide an alluring source of energy because of the versatility of fuel that can be used to produce electricity. For example, some microbially powered-fuel cells can obtain significant power from untreated sewage sludge or industrial effluents. While most microbial fuel cells utilize chemical electron shuttles, or mediators, there are also examples in which bacteria such as *Shewanella oneidensis* MR1 attach to electrodes and transfer electrons directly, thus eliminating the need for the electron mediators. However, these cells produce

relatively low power ($0.6V \cdot 0.002A \cdot 21 \text{ cm}^2 = 0.0028 \text{ Watts/m}^2$). Increase in power may be obtained with large electrode surfaces and/or increased microbial activity. The purpose of this study was to screen for respiration-related genes responsible for surface electron transfer. In the future controlling the expression of these genes could, in principle, lead to significant enhancement of the efficiency of MFCs. We tested the performance of 16 deletion mutants of *S. oneidensis* MR1, which were altered in various functions related to respiration. This allowed the identification of genes that, when altered, caused a decrease in the production of current in the MFC. In addition, the ability of the various mutants to attach to the electrodes of the MFC was monitored microscopically.

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Category: Life Sciences

Name: Megan McGeary, Ashley Wofford

Submission Type: group

Faculty Sponsor(s) & Department(s):

Melvin Lyon, Biological Sciences;
William McClure, Biological Sciences

Format: Laboratory-based Research

Title: Comparison of Behavioral Time-Patterns in Manic and Schizophrenic Patients

Abstract: Introduction: Lyon and Kemp (2004) found schizophrenic patients more highly organized in behavioral time-patterns than healthy controls. This ‘hyperorder’ appeared contrary to conceptions of disorderly or chaotic behavior in schizophrenia. Based on a few cases, Lyon and Kemp suggested that active-phase manic

patients might show similar results. This study tests this supposition, using the same two-choice task and time-pattern analysis of Lyon and Kemp.


Methods: Subjects were 19 active-phase manic patients and 19 healthy controls, age- and gender-matched. Subjects took a two-choice, button-pressing test, where they guessed location of a (+) sign behind two boxes on a computer screen. Using one hand, they pressed the button under the chosen box. The computer programmed 150 right-left changes, into which 18 knowledge-of-results and 16 coin reinforcements were pseudorandomly interjected. Magnusson’s THEME method searched for significant time-patterns and their complexity. Statistical analyses used SPSS.

Results: Manic patients made more responses than controls ($p=0.000$, T-test). No significant differences occurred between groups in number of different patterns, pattern occurrences, or rate of pattern production. However, manic time-pattern hierarchies were more complex than controls, particularly in females ($p=0.037$, T-test). Manic patients showed more same-side button-pressing repetitions than controls, or Lyon and Kemp’s schizophrenic subjects.

Conclusion: This study does not support the hypothesis that manic time-patterning is similar in structure to that of schizophrenics, as suggested by Lyon and Kemp. Repetitious behavior is a hallmark of both disorders, but is more prevalent in mania. This evidence further supports the need for different treatment approaches to schizophrenia and mania.

CATEGORY

Physical Sciences Math & Engineering



Category: Physical Sciences, Math & Engineering

Name: Jennifer Hulme, David Villalobos

Submission Type: group

Faculty Sponsor(s) & Department(s): Lowell Stott, Earth Sciences

Format: Laboratory-based Research

Title: Analysis of $\delta^{18}\text{O}$ in East Indian Stalagmites

Abstract: Most of the current information on the Indian Summer Monsoon (ISM) has been limited to weather data collected from around the 1850s to the present. This limits the understanding of the ISM's cyclicity on a longer time scale. Analysis of earlier changes in the ISM cycle can be analyzed by collecting stalagmite samples from caves around India. We have dated the stalagmite samples along their growth axes to obtain high resolution age dates. We then collected samples continuously every .1mm along

the stalagmite growth axes using a tri-axial drill. Every tenth sample (equaling approximately every millimeter along the stalagmite) was placed in a mass spectrometer for analysis of $\delta^{18}\text{O}$ content of the carbonate. As the monsoon rains have significantly lower $\delta^{18}\text{O}$ levels than regular meteorological water entering the caves, periods with heavier monsoon seasons show lower $\delta^{18}\text{O}$ levels while drier periods present higher $\delta^{18}\text{O}$ levels. By analyzing stalagmites from two different locales in India, we can not only see when there were greater monsoon periods, but whether or not the greater monsoon periods affected all of India. This knowledge will aid in predicting future cycles of the ISM and help prevent future drought-induced famines.

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Category: Physical Sciences, Math & Engineering

Name: Jennifer Tsakoumakis, Billy Kaplan

Submission Type: group

Faculty Sponsor(s) & Department(s): Ewald Schuster, Aerospace and Mechanical Engineering

Format: Creative Work

Title: The Composite Violin

Abstract: The objective of this project was to create a composite violin that produced the same sound as a conventional wooden violin. The basic assumption for this experiment was that if the violin shape was held constant and the material properties were replicated, then the sound produced by a composite violin would be the same as the wooden violin. Sound for this experiment was

characterized by the rate of decay of the tone and the quality of the tone, or timbre. Both of these parameters were acoustic properties that were quantitatively compared. Data was taken for the A string and the D string of each violin and proved that the sound was indeed the same.

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Category: Physical Sciences, Math & Engineering

Name: Hunter Francoeur, Anmol Bhagchand, Laura Black, Scott Callaghan, Anthony Carlton, Ifraz Haqqe, Andrew Hart, Emily Mullen, William Paetzke, Brandee Pierce, Jeremie Smith, Karim Vidhani, Christopher Wu, Dennis Wu

Submission Type: group

Faculty Sponsor(s) & Department(s): Tom Jordan, Earth Sciences

Format: Creative Work

Title: SCEC/VIDEO: IT Research for Earthquake Science and Communication

Abstract: In the Southern California Earthquake Center's Undergraduate Studies in Earthquake Information Technology (SCEC/UseIT) intern program, students with varied skills and talents conduct research needed by earthquake scientists. Using a number of open-source technologies including web services, PHP, XML, CVS, Java3d, and JDOM, interns participate in software research and have developed interactive software tools to manipulate and integrate heterogeneous data sets in order to visualize faults, earthquakes, maps, and geographic data. The first intern software package, LA3D, is now distributed to SCEC scientists, and interns this year developed BugTrack, a

software support website with a database backend. This year, UseIT interns also designed, engineered, and began to implement SCEC-VIDEO, a visualization package to represent earthquake data on a global scale, so it can be useful to places like China and Japan. SCEC-VIDEO has a plug-in architecture that is extensible and scalable, to enable users to add datasets and functionality more easily and thus increase the usefulness of the software to the earth science community. Key intern research projects have involved how to properly handle and visualize extremely large datasets, and the use of GIS web services to obtain images and maps on the fly. Changes were also made to facilitate the rapid scripting of animated movies for public education. UseIT interns experimented with ways to use imagery to simply and accurately communicate important earth science concepts. Movies made by UseIT interns have been sent to the media after important earthquakes, and are downloadable over the web.

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Category: Physical Sciences & Engineering

Name: Matthew Smith

Submission Type: individual

Faculty Sponsor(s) & Department(s): Frank Corsetti, Earth Sciences

Format: Laboratory-based Research

Title: Using Image Compression to Find the Presence of Life in Ordovician Stromatolites

Abstract: It has been under-appreciated that inorganic processes can produce stromatolites (laminated visible constructions commonly attributed to the

activity of microbes), thus calling into question the customary use of stromatolites as de facto evidence for life. Thus, if the Mars rovers find a stromatolite, biologic origin is not sufficiently known without supporting evidence. Here, image compression was employed to determine whether or not life was involved in the construction of a stromatolite. The compression algorithm finds and encodes redundant strings of information to create a smaller file. It has been hypothesized that if organisms controlled the organization and formation of these structures, the stromatolites will be more ordered, regular, and redundant. Thus, the images of organically formed stromatolites would be more compressible than those that are inorganically formed. In this study, we used a putative biotic stromatolite and the surrounding abiotic matrix from the Ordovician Pogonip Group, near Pahrump, Nevada. A thin section was produced (~40 microns thick) and examined with a petrographic microscope. The stromatolite and matrix were digitally imaged at several magnifications (a total of 120 images taken of each). Each image was then compressed using the LHa algorithm. No exceptional difference was noted in compressibility between matrix and stromatolite; thus, the hypothesis that biotic structures would compress differently than abiotic structures needs re-evaluation. However, the compression variance of the biotic stromatolite was much narrower than the abiotic matrix. Thus, the variance, not the absolute compression as originally hypothesized, may have greater potential

for determining the formation mechanism.

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Category: Physical Sciences, Math & Engineering

Name: Ryan Prose

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Jean Morrison, Earth Sciences

Format: Senior Honors Project

Title: Slab Window Magmagenesis and Oxygen Isotope Systematics, Ruth Pluton, AK

Abstract: Subduction of an ocean spreading ridge can create a slab window, the size and geometry of which are governed by the incident angle of the ridge to the continental margin, the relative velocities of the plates, and the angle at which each plate is subducted. This slab window exposes relatively cool lower continental crust to hot, upwelling mantle and results in a melt generated either from the lower continental crust or the upwelling mantle. During its rise to emplacement there is ample opportunity for contamination of the melt by assimilation of its host. Depending on the contaminant this can alter the melt's $\delta^{18}\text{O}$ values.

The Ruth pluton in southern Alaska was generated as a result of magmatism in the slab window created by subduction of the Kula-Farallon ridge. It displays anomalously high $\delta^{18}\text{O}$ values which are thought to have resulted from contamination of the melt by its sedimentary host. More in-depth analysis of the $\delta^{18}\text{O}$ values of the core and margin of this pluton will help to

constrain the source of the pluton and the mixing dynamics of its rise. Increased understanding of these processes of genesis and mixing are important to any analysis of slab window magmas.

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Category: Physical Sciences, Math & Engineering

Name: Jeffrey Hoefl

Submission Type: individual

Faculty Sponsor(s) & Department(s):

James Dolan, Earth Sciences

Format: Field Research

Title: Identification of Geomorphic Features along the Western Garlock Fault, California

Abstract: The 248 km Garlock fault is a left-lateral strike-slip fault found to the north of the Transverse Ranges in Southern California and strikes northeast to east. The fault is diffuse in some areas – displaying multiple strands, bends, and step-over structures. Because of these features, the Garlock can be regarded as having three separate sections: a western, central, and eastern segment. The western section spans from the San Andreas Fault eastward to Koehn Lake where there is a prominent left step in the fault. The central section extends from Koehn Lake east to the Quail Mountains where there is a 15 degree restraining bend in the fault. The eastern section lies to the east of the Quail Mountains and becomes poorly defined at the southern end of the Death Valley fault system. Although there are no large historical earthquakes associated with the fault, geomorphic features such as deflected streams, shutter ridges, and scarps are well expressed. Aerial

Photograph analysis, site surveys, and mapping all help identify these features, and help to determine a displacement history for the fault. This study builds on previous work to identify geomorphic features and constrain slip distances by analyzing four sites within the western extent of the Garlock fault. By comparing the slip history within the three sections of the fault, the eventual goal is to understand whether the Garlock acts as one, continuous, through-going structure, or alternatively as three independent segments.

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Category: Physical Sciences, Math & Engineering

Name: Jeffrey Rich, Takehiro Oyakawa

Submission Type: group

Faculty Sponsor(s) & Department(s):

Edward Rhodes, Physics & Astronomy

Format: Laboratory-based Research

Title: Temporal Shifts in the Frequencies of Solar P-Mode Oscillations Using GONG Data

Abstract: Helioseismology is the study of the structure and dynamics of the solar interior through the analysis of the motion of trapped acoustic waves at varying depths therein. These trapped standing waves have shown a direct correlation between changes in their frequencies and spherical degree of many of these harmonic modes and the 11-year cycle of solar activity. However, most of these studies have utilized long time-series of observations, in most cases covering two or more solar rotations, which have prevented the study of the changes in frequencies due to individual solar active regions. Our project will present measurements of

these frequency changes over a series of short-duration time-series which have been selected to maximize the sensitivity of the p-mode frequencies to changes in the levels of solar activity. We have shown that the frequencies of the harmonic modes can be measured accurately and reliably from runs which are as short as three days in duration. The frequencies we have studied were computed from time series of Dopplergrams acquired by stations of the Global Oscillation Network Group (GONG) Project. Our computations utilized software developed by the Observational Helioseismology Group in USC's Department of Physics and Astronomy. We have also computed the sensitivities of these frequencies to several different indices of solar activity and we have also compared these sensitivity values with earlier values computed from observations obtained from the MDI Experiment on the NASA/ESA SOHO Spacecraft.

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Category: Physical Sciences, Math & Engineering

Name: Suet Ying Chong, Pavitra Krishnaswa, Matthew Boatman, Curtis Wong

Submission Type: group

Faculty Sponsor(s) & Department(s): Martin Gundersen, Viterbi School of Engineering, Department of Electrical Engineering, Physics and Astronomy, and Material Science; Laura Marcu, Biomedical Engineering, Viterbi School of Engineering; ,

Format: Laboratory-based Research

Title: Green Fluorescent Protein labeled cyt-C release in 293T Cells treated with UPSET

Abstract: Recent research has shown that nanosecond high electric field pulses trigger intracellular events resembling the apoptotic pathway in malignant cell lines. We have observed calcium burst upon application of our nanosecond ultra-1 MV/m pulses. However, intracellular calcium release does not exclusively indicate apoptosis since calcium is involved in many signaling pathways. In contrast, cytochrome-C released from mitochondria directly triggers apoptosis. To visualize nanopulse-induced cytochrome-C release, cytochrome-C plasmids were labeled with Green Fluorescent Protein (GFP) and transfected into transformed human embryonic kidney cells (293T) through electroporation. We observed fluorescent structures within pulsed cells, and transfection rate is about 10-30%. We work to develop the technique of GFP-tagging and transfection further to observe fluorescent structures and morphological changes in cells treated with UPSET. Varying UPSET pulse regimes will help understand the dependence of cytochrome-C release on risetime, pulse-width and peak voltage of applied pulses. To facilitate this cross-pulse-regime exploration, we are developing pulse generators that can provide a spectrum of pulse parameters: especially rise-time, peak voltage and pulse-width. Currently our experiments use 3ns pulses with peak voltage ≤ 1.2 kV. We have initiated a shift from the MOSFET realm to the avalanche transistor realm that promises sub-nanosecond rise-time pulsers.

Developing avalanche transistor pulse generators that act on high impedance cell loads is an important research problem, as it not only facilitates our cellular studies, but also explores the behavior of solid-state high-voltage high-frequency switches.

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Category: Physical Sciences, Math & Engineering
Name: Jeffrey Lee, Saifudin Abubakar, Chingyeh Chen
Submission Type: group
Faculty Sponsor(s) & Department(s): James Haw, Chemistry
Format: Laboratory-based Research
Title: Modified Silicoaluminophosphate Catalysts for Higher Ethylene and Propylene Selectivity
Abstract: According to past literature, modification of silicoaluminophosphate zeolite HSAPO-34 by silanation at 150 degrees Celsius significantly reduces the void volume of the HSAPO-34 cages without creating diffusion limitations. Prior modifications used only one equivalent of silane with respect to Bronsted acid sites. This study investigates the effects of varying the equivalence of silane and temperature on HSAPO-34 (Si/Al=40). ¹H Bloch decay, ²⁹Si Bloch Decay and ²⁹Si CP MAS-NMR confirm the presence of four equivalents of silane with silane polymerization. Following oxidation at 600 degrees Celsius, ¹H and ²⁹Si Bloch Decay MAS-NMR confirm that the Bronsted acid site was regenerated and siliceous species were formed in the cages. A significant reduction of void volume is confirmed by absorption of methanol post-oxidation. Silane

modified HSAPO-34 absorbed 36.672ul of methanol, while standard SAPO-34 absorbed 37.910ul of methanol after 60 minutes. Profiling of MTO (methanol-to-olefins) conversion and selectivity is still in progress.

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Category: Physical Sciences, Math & Engineering
Name: Deborah Jarrett
Submission Type: individual
Faculty Sponsor(s) & Department(s): Mimi Yu, Department of Preventive Medicine; Jian-Min Yuan, Preventive Medicine
Format: Laboratory-based Research
Title: The Relationship between tea and COMT, SULT 1A1, and UGT 1A1 on Breast Cancer
Abstract: Breast cancer is the most common cancer among American women and its rates are rising in traditionally low-risk Asian populations. Tea catechins are potent antioxidants that may protect against breast cancer via their ability to scavenge reactive oxygen species (ROS). ROS can cause oxidative stress and induce cell damage that can result in malignant transformation of the affected tissue. Catechol-O-methyltransferase (COMT), Sulfotransferase (SULT) 1A1, and UDP-glucuronosyltransferase (UGT) 1A1 are enzymes that catalyze the metabolism of various substrates including tea catechins. COMT, SULT 1A1, and UGT 1A1 function as methylation, sulfonation, and glucuronidation enzymes, respectively, that render their substrates inactive. However, each enzyme has a polymorphism that modifies their metabolic activity. It is

hypothesized that individuals carrying the low metabolic activity COMT, SULT 1A1, and UGT 1A1 genotypes derive the most benefit from ingestion of tea, because they inefficiently inactivate the tea catechins. The objective of the present study is to assess the independent and interactive effects of tea and COMT, SULT 1A1, and UGT 1A1 on breast cancer risk. This study utilizes the Singapore-Chinese Health Study database, which is a prospective cohort study involving approximately 60,000 middle-aged or older Chinese women and men in Singapore.

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Category: Physical Sciences, Math & Engineering

Name: Stephanie Lewis

Submission Type: individual

Faculty Sponsor(s) & Department(s): Scott Paterson, Earth Sciences

Format: Field Research

Title: Mapping the Geology of Joshua Tree National Park-SW Quadrangle, Yucca Valley, CA

Abstract: Joshua Tree National Park in Yucca Valley, California is an infinitely variable environment where two deserts and ecosystems come together. Over a million acres, the Colorado Desert occupies the eastern half of the park, and the higher, cooler Mojave Desert covers the west. Famous for their named Joshua trees, the park contains some of the most interesting geologic displays found in California's deserts. However, no current geologic map exists for the park. My previous professor, Scott Paterson, and his team, have been working to complete the first geologic map. After joining them, I spent extensive time

camping/hiking in and studying the Southwest Quadrangle of the park. I mapped with other researchers and by myself, recording data about the rock units we encountered, their petrology, and the structures we found, including foliations, lineations, folds, and faults. I also collected hand samples for studying. Using this data, I created stereonet and geologic maps, and learned about the geologic history of the area in the process. The enormous plutonic intrusions seen throughout the park were created by upwelling of molten liquid in the earth's mantle. The other rock type frequently seen is the magmatic gneiss, which are caused by the melting and metamorphism of the granitic plutons. Also abundant are the areas of jointing, which in one way, are caused by the erosion of overlying rock. However, weathering processes are only partially responsible for the current face of the rocks-beneath the surface, they contain millions of years of stories.

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Category: Physical Sciences, Math & Engineering

Name: Katherine Savage

Submission Type: individual

Faculty Sponsor(s) & Department(s): Mark E. Thompson, Chemistry

Format: Laboratory-based Research

Title: Synthesis and Photophysics of Cyclometalated Azaperylene Iridium (III) Complexes

Abstract: A study of iridium(III) and platinum (II) complexes of azaperylene is reported. Reacting naphthalene-1-boronic acid and 1-chloroisoquinoline in a Suzuki Coupling reaction yields 1-naphthyl-2-quinoline. Upon reacting this

compound with potassium the corresponding azaperylene ligand is produced. Reacting this ligand with $\text{IrCl}_3 \cdot n\text{H}_2\text{O}$ yields the chlorine-bridged dimer. Likewise, reacting the azaperylene ligand with K_2PtCl_4 produces the platinum-bridged dimer. Luminescent, monomeric iridium and platinum complexes are then prepared by reacting each dimer with 2,4-pentadione, which produces the corresponding acetylacetonate (acac) complex, $\text{C}_2\text{N}_2\text{Ir}(\text{acac})$ and $\text{C}_2\text{N}_2\text{Pt}(\text{acac})$. The strong spin-orbit coupling of iridium and platinum mixes the formally forbidden 3MLCT and 3pi-pi transitions with the allowed 1MLCT, leading to strong phosphorescence with good quantum efficiencies and room temperature lifetimes in the microsecond regime. I will discuss the synthesis, photophysics, and applications of these Ir and Pt azaperylene complexes.

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Category: Physical Sciences, Math & Engineering
Name: Peter Tipton
Submission Type: individual
Faculty Sponsor(s) & Department(s): Michael Crowley, CSCI
Format: Field Research
Title: Human Computer Interaction
Abstract: Too often computers are too complex and hard to use. Sometimes you have to spend more time figuring out how to use a system than you do actually using it. The field of Human Computer Interaction (HCI) aims to find out what makes an interface good or bad and how to best implement good user interfaces.

This video explores a few general concepts of HCI as well as different implementations being researched today:

- the history of HCI
- definition of HCI
- simple vs complex user interfaces
- virtual reality
- the future of HCI.

These topics are investigated through interviews with USC professors who work in this field, as well as demonstrations of a few implementations of new types of user interfaces being researched today.

§§§§

Category: Physical Sciences, Math & Engineering

Name: Burton Newman

Submission Type: individual

Faculty Sponsor(s) & Department(s): Sheldon Kamienny, Mathematics

Format: Creative Work

Title: Covering Systems of Congruences

Abstract: A covering system $\{a_i \bmod b_i\}$ is a finite collection of congruences such that every integer satisfies at least one of them. A covering system is called exact if every integer satisfies exactly one congruence, and is called incongruent if b_1, \dots, b_k are distinct. In the 1950's the mathematician Paul Erdos introduced the notion of a covering system to prove that there are infinitely many integers not representable as the sum of a prime number and a power of 2. Since then the problem of describing the structure of covering systems has motivated some beautiful conjectures by Erdos:

- 1 For any number $n > 0$ there exists an incongruent covering system $\{a_i \bmod b_i\}$ with $b_i > n$ for all i .
- 2 There is no incongruent covering system with all b_i odd and greater than 1.
- 3 In an exact cover $\{a_i \bmod b_i\}$ ($i = 1, 2, \dots, k$) with $b_i \leq b_{i+1}$ for all i , $b_{k-1} = b_k$

The first two conjectures are still open, but the last of these conjectures has been proven and subsequently improved. In this project we give an alternative description of a covering system which involves roots of unity. We use this condition to prove one of the strongest results known in the direction of the last conjecture. We also prove other known theorems about covering systems which were initially proven using analytic techniques.

§§§§

Category: Physical Sciences, Math & Engineering

Name: Sofia Mohaghegh, Emi Fujii

Submission Type: group

Faculty Sponsor(s) & Department(s):

Kenneth H. Nealson, Earth Sciences and Biological Sciences; Massoud Pirbazari, Civil and Environmental Engineering

Format: Laboratory-based Research

Title: Microbial Reduction and Removal of Hexavalent Chromium from Drinking Water

Abstract: Chromium is widely used in industrial applications, and it exists mainly in two states, the toxic Cr(VI), and the significantly less toxic Cr(III). Owing to high aqueous solubility and toxicity, Cr(VI) contaminates groundwater, surface water and soils,

causing health hazards including cancer. Currently, the drinking water standard for Cr(VI) in the State of California is 50 parts per billion (ppb) and 100 ppb for Federal agencies. However, the Public Health Goal for California is 2.5 ppb, and to attain this goal, efficient and economical remediation technologies are required. The study focuses on identifying the most efficient combinations of *Shewanella* strain(s) and organic substrates for Cr(VI) reduction. *Shewanella* are unusual among metal reducers because of their ability to grow aerobically, utilize a spectrum of organic substrates or electron donors, and reduce some transition metals from soluble oxidized states to insoluble reduced states with favorable kinetics. Well-plate studies are used to screen the best organic substrates and *Shewanella* strains. Limited batch reactor and chemostat studies determine reaction biokinetics and optimize process conditions. The study emphasizes genome sequencing as a valuable tool for choosing the optimal microbial species and organic substrates for this application. This interdisciplinary research provides basic understanding of microbial biochemical reactions associated with Cr(VI) reduction at low ppb levels, so that the technology can be integrated into conventional water treatment systems. It is anticipated that the outcome would benefit public utilities and industry in using biotechnologies for water treatment applications.

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Category: Physical Sciences, Math & Engineering
Name: Noah Jacobson, Hieu Nguyen
Submission Type: group
Faculty Sponsor(s) & Department(s): Maxim Olshanii, Physics and Astronomy
Format: Field Research
Title: Low-Energy Universality in One-Dimensional Quantum Scattering
Abstract: The few-parametric universality, when exist, can serve as a basis for an extremely simple few-parametric Effective Field Theory of a many-body system. The goal of this project is to identify a set of criteria for this to happen, and we start from the two-body one-dimensional case as the most transparent.

We examine the one-dimensional scattering of s and p waves off double delta functions and rectangular wells, seemingly very different objects. We show that that both potentials belong to the same universality class, marked by the structure of the zero-energy wavefunction. This solution is parameterized by a single length scale (so-called scattering radius), and in course of the project we conjectured that this length scale governs all other low-energy observables. Indeed, we find that both the scattering length, that defines positive energy behavior, and bound state energy, negative by construction, are indeed functions of the scattering radius alone, and despite the dramatic difference between the potentials considered these dependencies are exactly the same for both potentials.

Thus, we show that universality covers not only the zero-energy solutions, but a whole range of energies.

When generalized to higher spatial dimensions, results of our project will allow one to formulate necessary conditions for a given Effective Field Theory of a quantum non-relativistic gas be self-consistent and non-divergent. Practical applications include Quantum Information Processing and Interferometric Sensing.

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Category: Physical Sciences, Math & Engineering
Name: Rahul Maini, Sam Bagwell
Submission Type: group
Faculty Sponsor(s) & Department(s): Antonio Ortega, EE-Systems
Format: Laboratory-based Research
Title: Low Level Signal Processing Tools for Music Genre Analysis
Abstract: The proliferation of information technology has changed the way people collect music. As Internet users download music files as individual songs, songs have replaced albums as the primary unit of stored music. By contrast, the genre is the broadest classification of music. We make the assumption that songs within a genre are more similar to each other than songs of different genres. Using the subjective measures of similarity provided by the experts of Allmusic.com to define what genres songs belong to, we found an objective measure which will correctly identify a song's genre. We used Mel Frequency Cepstral Coefficients (MFCCs) to extract frequency

information from each song. Using this information we were able to create an algorithm that determined whether an unknown song was of the rock or classical genre with high accuracy.

§§§§

Category: Physical Sciences, Math & Engineering

Name: Christina To

Submission Type: individual

Faculty Sponsor(s) & Department(s): Stephen Bradforth, Chemistry

Format: Laboratory-based Research

Title: UV Damage in DNA: Primary Processes

Abstract: A detailed understanding of DNA photodamage by UV light is critical to preventing mutation-generating damage which may cause cancer. It has been long suggested but never proved that the site of UV absorption may not be the site of damage, because the energy carried by the absorbed photon of light may migrate to another base; the “exciton” (the excitation caused by the UV light) may be mobile. Pump-probe experiments are being carried out to investigate this possibility of energy transfer in DNA, made possible by the development of laser sources that generate extremely short (10^{-14} sec) pulses of UV light. If the excitation moves along the DNA strand (which can only occur while one base is still in an excited state) the polarization of the probe absorption should change because the bases’ molecular orbitals are oriented at different angles with respect to each other. Control experiments on the DNA units adenine, adenosine and ATP have been performed and detect the $< 10^{-12}$

second excited state lifetime as well as a high initial probe polarization. Initial data for an RNA polymer (polyA) show no polarization decay and hence no evidence of energy transfer. This single-stranded polymer is thought to adopt a stacked structure at neutral pH which should be favorable for energy transfer along the stack. Future work includes measuring the transient absorption of double-stranded DNA molecules of various sequences to seek evidence of energy transfer and its dependence on sequence or conformation of the polymer.

§§§§

Category: Physical Sciences, Math & Engineering

Name: Douglas Mason

Submission Type: individual

Faculty Sponsor(s) & Department(s): Werner Dappen, Astronomy

Format: Creative Work

Title: Numerical Methods in Stellar Model Calculation

Abstract: As a radially symmetric ball of plasma, the Sun can act as a resonating chamber for seismic waves, commonly known as sunquakes. These resonating waves travel through the interior of the Sun where instruments and light cannot penetrate, and thus can provide indirect clues to inner structure. In the last 30 years, comparisons between observed and computed frequencies have helped us tremendously to learn about the interior of the sun. The pedagogical history of this study, known as helioseismology, has focused on the Heyney method in a simplified 2-dimensional parameter space. This project instead extends the Newton-

Rhapson method to 4-dimensional parameter space that allows us to answer more questions more directly about stellar structure. In particular, it allows us to examine bifurcations in stellar evolution.

CATEGORY

Social Sciences

Category: Social Sciences

Name: Evan Nunez

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Melvin Lyon, Biological Sciences

Format: Laboratory-based Research

Title: Tourette's Syndrome and the Effects of Mozart's Music

Abstract: Wolfgang Amadeus Mozart's music has elicited an increase in the spatio-temporal reasoning of children for fifteen minutes after listening. Research also shows that his music produces calming effects in autistic children and animals. These effects are more pronounced in Mozart's work than that of other composers. Could the reason for this singularity be related to Mozart's purported suffering from Tourette's Syndrome? This neurological disorder is related to dopaminergic dysfunction in the brain, and could have affected the way Mozart composed music. Using a computer program, THEME, which

analyzes time-patterns in human behavior, researchers have determined that hyperdopaminergic brain function can result in a marked increase in time-pattern structure (Lyon and Kemp 2004). I hypothesize that a THEME analysis, based on Mozart's music, compared to that of others not known to suffer dopaminergically-related disorders, may exhibit more complex and numerous time-patterns.

Currently, our research focuses on developing an efficient method for representing music as a file-type interpretable by THEME. We have accomplished this by generating a text file containing the start- and stop-times for each note in a musical piece. A MIDI file (performance data information including note on/off events) of the composition is imported into a MIDI sequencer (Pro Tools), where it is then "quantized" to rid the file of interpretive performance qualities. The quantized MIDI file is then exported out of Pro Tools, converted into a text file, and, finally, saved as a THEME data file. Music from Mozart and other composers are being compared in the present study.

§§§§

Category: Social Sciences

Name: Pamela Singer

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Laura Baker, Psychology

Format: Senior Honors Project

Title: Differential Maternal Affect and the Development of Depression in Twins

Abstract: Depression often begins to emerge in early childhood, yet confusion remains over whether the source of

childhood depression is genetic or environmental. The study of differences between monozygotic (MZ) twins is one method for understanding the environmental basis of depression. Using a subset of data from an ongoing study of twins to examine the effect of parental environment on childhood depression, the current study used interview-style questionnaires to analyze approximately 600 pairs of twins and their caregivers regarding both child and caregiver perceptions of maternal affect (negativity and warmth) toward each twin. Caregivers completed several additional questionnaires regarding their perceptions of symptoms indicative of depression in each twin, including internalized behavior questionnaires and interviews based on the DSM-IV criteria for diagnosing GAD and Major Depression. The relationship between maternal affect and different aspects of childhood depression are examined both within families and between individuals using correlational methods. Between-pair analyses and preliminary analyses included all twins; within-pair analyses examined only monozygotic twins. In both between-pair and within-pair analyses, results are compared for child and mother's perceptions of maternal affect.

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Category: Social Sciences
Name: Brent Clermont
Submission Type: individual
Faculty Sponsor(s) & Department(s):
Sandra Chrystal, Center for Management Communication
Format: Field Research

Title: Clip the Birds' Wings: The Unethical Actions of the ATSB
Abstract: "Clip the Birds' Wings" argues that the Air Transportation Stabilization Board (ATSB) should not provide guaranteed loans to airlines. The ATSB, created after the September 11 terrorist attacks to provide federal loan guarantees to failing airlines, gives airlines a chance to survive.

My paper argues that while the purpose of the ATSB was well intentioned, the ATSB ultimately harms the airline industry. The guaranteed loans interfere with the normal operation of the free market economy, forcing an abundance of airline seats on the market – causing viable airlines to suffer financially from the excess supply.

The ATSB's actions prove to be unethical on several counts. The three-member board arbitrarily and unfairly supports one airline financially at the neglect of another. The standards the Board uses to determine if an airline is qualified for a guaranteed loan are subjective and unreliable. Over a billion dollars has been guaranteed to airlines – many which are currently in bankruptcy. The ATSB fails to consider the best interests of all of the stakeholders that experience the ramifications of the Board's decisions.

We should learn from the actions of the ATSB and allow the free market to determine which airlines will and will not succeed.

My conclusions are formed from research that looks at the minutes of the ATSB's meetings as well as accounts

from various employees working in commercial aviation. I look at the testimony of heads of airlines as well as trade journals, and scholarly articles on the issue.

§§§§

Category: Social Sciences

Name: Jiajun (Johnny) Zhu, , Yi Chai, Ling Nam Mo, Ee Ling Ooi, Pagee Cheung, Leticia Campbell

Submission Type: group

Faculty Sponsor(s) & Department(s):

Iris Chi & Maryalice Jordan-Marsh, School of Social Work; Sandra Howell, Biokinesiology & Physical Therapy; Margaret McLaughlin, Annenberg School for Communication

Format: Field Research

Title: Health Information Resources Online for Chinese Seniors

Abstract: This paper reports on a research project carried out by an interdisciplinary team at USC to develop a multilingual, user-friendly health information website for older Chinese Americans. The focus is to strengthen the self-help ability of non-English speaking older Chinese consumers through partnerships with community agencies and providers by testing intervention strategies using the Internet. Bilingual students were recruited and supervised by both academics and community leaders to collect available websites which provide relevant information in Chinese languages. These websites were assessed for their credibility and linked to a new gateway designed by the team called WHERE (Web-based Health Education Resources for Elders). A Cyberhealth training protocol developed by CyberSeniors.org

was adapted and translated and taught to Chinese older adults at a community center. Data was collected (questionnaire) before and after the training to measure the impact of a Cyberhealth training course on Internet health information seeking attitudes. Result: 1) Few Chinese language websites originating in the US, more in Australia, Canada and Asia; 2) US government recommended translation tool (Babelfish) inadequate. Conclusions: 1) Multi-lingual websites are often limited to English language searching; 2) Adapting USA Cyberseniors website impeded by lack of Chinese-language sites: safety, clinical trials, and dynamic assessment.

§§§§

Category: Social Sciences

Name: Elizabeth Cook

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Carole Shammas, History

Format: Creative Work

Title: Quantitative Analysis of the Growth of Nineteenth Century American Theatre

Abstract: Theatre history is a field dominated by research based on tracing artistic developments and the lives of famous participants. This analysis seeks to take such research into another realm, that of quantitative analysis. Micro-level data obtained from the U.S. Census manuscripts courtesy of IPUMS was analyzed statistically to determine whether certain variables had an affect on one's entry into the business and if the theoretical growth of theatre can be numerically substantiated. To do the

first, theatre occupations were regressed against selected variables to ascertain which had the most affect on whether or not an individual became an actor. To do the second, the number of cases from each year, as well as the geographic concentrations of these cases, is compared to the existing claims about the growth of theatre during the second half of the long nineteenth century.

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Category: Social Sciences

Name: Ninive Sanchez

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Laura Baker, Psychology

Format: Laboratory-based Research

Title: Social Risk Factors in Childhood Externalizing Behavior Problems: Understanding

Abstract: This study examined social risk factors for childhood externalizing behaviors (aggression and delinquency) and how these risk factors and their relationships to externalizing problems differ across ethnic groups. The participants included 605 sets of male and female twins and triplets (aged 9-10 years) and their primary caregivers. The data were derived from the Southern California Twin Project, a longitudinal study of childhood behavior problems in a sample mirroring the diverse ethnic makeup of Los Angeles County. Externalizing problems were assessed using caregiver and teacher reports using the Child Behavior Checklist (CBCL), as well as child, caregiver, and teacher ratings of reactive and proactive aggression. Social risk factors were assessed from surveys assessing characteristics of the caregiver, family

background, and neighborhood conditions. Mean ethnic group differences in both externalizing behaviors and the social risk factors themselves were found, although the magnitude and direction of differences varied across measure and informant. Relationships between child externalizing behaviors and the social risk variables also varied across ethnic groups, suggesting that different prediction models are required for children from different ethnic backgrounds. SES and poor neighborhood conditions were stronger predictors of caregiver and teacher ratings of externalizing problems in Caucasians, Blacks, and Asians, but not Hispanics. Caregiver stress (both financial and non-financial) was a strong and significant predictor of caregiver ratings of externalizing problems in Caucasians, Hispanics, Blacks, and Mixed ethnic children, but not Asians. Implications for prevention programs for youth who may be at risk for problem behaviors are discussed.

§§§§

Category: Social Sciences

Name: Michael Lee, Lanita Williams, Ian Topic, Jasper Lee

Submission Type: group

Faculty Sponsor(s) & Department(s):

Brent J. Liu, BME & Radiology; Han Huang, BME & Radiology

Format: Field Research

Title: Implementation of an ASP Model Offsite Backup Archive for Clinical Images

Abstract: With the development of PACS technology and an increasing demand by medical facilities to become

filmless, there is a need for a fast and efficient method of providing data backup for disaster recovery and downtime scenarios. At the Image Processing Informatics Lab (IPI), an ASP Backup Archive was developed using a fault-tolerant server with a T1 connection to serve the PACS at the St. John's Health Center (SJHC) Santa Monica, California. The ASP archive server has been in clinical operation for more than 18 months, and its performance was presented at this SPIE Conference last year. This paper extends the ASP Backup Archive to serve the PACS at the USC Healthcare Consultation Center II (HCC2) utilizing an Internet2 connection. HCC2 is a new outpatient facility that recently opened in April 2004. The Internet2 connectivity between USC's HCC2 and IPI has been established for over one year. There are two novelties of the current ASP model: 1) Use of Internet2 for daily clinical operation, and 2) Modifying the existing backup archive to handle two sites in the ASP model.

This paper presents the evaluation of the ASP Backup Archive based on the following two criteria: 1) Reliability and performance of the Internet2 connection between HCC2 and IPI using DICOM image transfer in a clinical environment, and 2) Ability of the ASP Fault-Tolerant backup archive to support two separate clinical PACS sites simultaneously. The performances of using T1 and Internet2 at the two different sites are also compared.

§§§§

Category: Social Sciences
Name: Alice Villatoro
Submission Type: individual
Faculty Sponsor(s) & Department(s): Laura A. Baker, Psychology
Format: Senior Honors Project
Title: Genetic, Environment, & Personality Factors Contributing to Alcohol Expectancies
Abstract: Understanding the etiology of adolescent alcohol outcome expectancies is important because of its relation to drinking patterns, prediction of future drinking, and mediation of alcohol consumption decisions. The purpose of this study was to investigate the genetic and environmental influences of alcohol expectancies. This study addressed three questions: (1) What are the genetic and environmental influences of alcohol expectancies? (2) How do these estimates change when controlling for familial history of alcohol use as a measure of the child's exposure to alcohol? (3) To what extent do correlated genetic and correlated environmental factors explain the relationship between child temperament characteristics (e.g. novelty seeking) and expectancies? The study was based on 100 pairs of pre-adolescent (11-14 years old) male and female monozygotic and dizygotic twin pairs and 50 primary caregivers from the Southern California Twin Project. The genetic and environmental etiologies of alcohol expectancies were investigated in three sets of analyses: (1) phenotypic associations examining the relation between expectancies, exposure, and novelty seeking through correlation and ANOVA tests; (2) univariate analyses to estimate the additive genetic, common environment, and individual

environmental influences in expectancies and exposure; and (3) bivariate analyses to evaluate the extent to which the covariation between expectancies and novelty seeking may be due to correlated genetic and/or correlated environmental effects. Preliminary univariate analyses indicated that the common and unique environments mostly explained adolescent outcome expectancies, not genetic effects. Our next step is to examine the relation between adolescent alcohol expectancies, familial exposure, and novelty seeking.

§§§§

Category: Social Sciences

Name: Catherine Lee

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Norman Miller, Social Psychology

Format: Senior Honors Project

Title: The Effects of Deviancy on Consensus Estimates

Abstract: This proposed study examined how a perceived deviant member of an ingroup affected the degree to which majority and minority group members estimate their ingroup consensus or agreement of opinions on a particular issue. Numerical status, where one is holding the opinion of the minority or majority group, was manipulated between subjects. Deviancy in the ingroup is the manipulative variable that determined whether there is a change in majority or minority consensus estimates. A numerical status X deviancy interaction emerged. Consensus estimates of participants who were told to be in the minority group were expected to give higher estimates

relative to participants who were told they share a majority status. Participants in the minority group who were exposed to a deviant ingroup member were expected to give higher consensus estimates relative to participants in minority groups who weren't exposed to a deviant ingroup member. Negative mood was measured to see if there is a relationship between being a part of the minority group and feeling bad. Strength of social identity was also measured to see if there is a relationship between higher consensus estimates and how strongly one feels about the opinion issue.

§§§§

Category: Social Sciences

Name: Eric Tang

Submission Type: individual

Faculty Sponsor(s) & Department(s): Sandra Chrystal, USC Marshall School of Business Center for Management Communication

Format: Field Research

Title: Private Foreign Micro-Enterprise Venture Investment in China's TVE System

Abstract: My research examines China's need to expand the TVE system for all rural regions and increase foreign investment, developing infrastructures and privatized industries to line the countryside to the global market. Using a macroeconomic approach based on aggregate statistical data and a macroeconomic approach based on a questionnaire survey of firms, my paper finds a positive and significant association between foreign direct investment and industrial productivity. Facing potential market opportunities,

managers of multinationals have become increasingly aware of the importance of relevant international expansion into China. These managers are eager to gain first mover advantages and build market leadership in these rural regions. However, given the uncertainties in the underdeveloped areas, the efforts of private foreign investment may not result in successful results.

This study examines whether private foreign investment and first mover initiative would attribute to successfully constructing infrastructure and technological developments in these regions. Part of the positive effect of township-village-enterprises (TVE), government free enterprise villages in rural areas, is the productive growth and industrial capacity in the villages. By developing further inland, this would pioneer a “Western movement” type to reverse the flow of mobile labor populations that have migrated from West to East towards the developed urban city centers such as Shanghai and Hong Kong. By developing the rural countryside, private foreign investors would provide capital to fund rural entrepreneurs to start up business concepts and plans as well as construction plans to build infrastructures needed to support these emerging economic regions.

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Category: Social Sciences

Name: Eri Izumi

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Gerald C. Davison, Psychology

Format: Senior Honors Project

Title: Examination of GAD Symptom Criterion Validity and Effect of Integrative Therapy

Abstract: This study examined the criterion validity for generalized anxiety disorder (GAD) DSM-IV symptom criteria and assessed the effect of seven weeks of integrative therapy on frequency and intensity of reported symptoms. Four GAD patients were administered Integrative Therapy once a week for seven weeks, during which they continuously self-monitored their symptom experiences using Worry & Anxiety Event Record. Anxiety Disorder Interview Schedule for DSM-IV (ADIS-IV) was administered at Baseline, Post-therapy, 3-month follow-up, and 6-month follow-up time points, in order to assess participants' symptom experiences and GAD diagnosis. Three sub-studies were conducted. Study 1 examined the endorsement rates for 19 symptoms associated with GAD, in terms of symptom frequency and intensity. As hypothesized, the six DSM-IV symptoms ranked higher in terms of symptom frequency and intensity endorsement than the twelve DSM-III-R symptoms. Study 2 compared the endorsement rates for frequency and intensity of GAD symptom in early and late stages of Integrative Therapy. As hypothesized, t-test for dependent samples showed that the frequency of symptoms significantly declined in the late stages of therapy compared to the early stages. Contrary to the hypothesis, however, intensity of symptoms did not show significant reduction. Study 3 compared the intensity of endorsed symptoms among Experimental Group and Waitlist Group participants, at 6 months following conclusion of therapy

sessions. As hypothesized, the EG participants showed significantly lower symptom intensity as a whole compared to the WL participants.

§§§§

Category: Social Sciences

Name: Fiona Torrance

Submission Type: individual

Faculty Sponsor(s) & Department(s): Sandra Chrystal, Business/Management Communication

Format: Field Research

Title: Muslim Female Students Are Challenged Academically

Abstract: Muslim women who attend educational institutions in the United States, such as the University of Southern California (USC), face a greater challenge academically because of their customs, community expectations, and emotions.

The customs causing conflict for Muslim female students includes their dress and rituals -- purity, prayer, fasting, and meals -- that at times impede their academic concentration.

Community expectation from both their own Muslim community and the Western community in which they are educated creates a problem for female Muslim students because of the conflicting principles and cultural interpretation of expectations.

Emotional challenges include social pressures to take a stand on either Western or Islamic standards.

The purpose of my research is to foster awareness about these challenges,

educate readers about Islamic principles, and to argue for the importance of tolerance between cultural groups in an academic setting. Promoting tolerance among students and faculty includes inter-cultural interaction and open discussion on the factors that pose academic challenges to these women.

The sources to support my research and conclusion include interviews with academic professionals and religious leaders at USC and Muslim female students. To express a balanced viewpoint, I have also interviewed Non-Muslim female students at USC about their perceptions of Muslim female students. Further research was obtained from academic journals and student feedback published on the Muslim Student Association and Muslim Union Weblogs of campuses throughout the United States.

§§§§

Category: Social Sciences

Name: Mallory Small

Submission Type: individual

Faculty Sponsor(s) & Department(s): Penelope K. Trickett, Social Work; Jo Ann Farver, Psychology

Format: Senior Honors Project

Title: Emotion Regulation: Mediating Childhood Sexual Abuse with Role Reversal in Parents

Abstract: This study is examining the long term effects of childhood sexual abuse by familial or non-familial perpetrators among 128 adult women (41 who were victims of sexual abuse, and 87 who were not). There are two objectives: to investigate the association of the identity of the perpetrator to

childhood sexual abuse and poor emotional regulation and to examine whether emotional regulation mediates role reversal in mothers' parenting styles with their own children. The overall purpose of the study is to understand the influence of sexual abuse on mothers' parenting styles. More specifically, to examine differences among sexually abused women who were violated by either familial or non-familial perpetrators as an indicator of problems with emotion regulation, which may later produce a role reversal between the women and their daughters.

§§§§

Category: Social Sciences
Name: An Heng Ho
Submission Type: individual
Faculty Sponsor(s) & Department(s): Craig Carroll, Journalism
Format: Field Research
Title: Media Literacy and Global Corporate Reputation
Abstract: The mass media are one of the primary ways that organizations develop corporate reputations (Carroll & McCombs, 2003) and one way organizations can evaluate how successful they are at having their messages conveyed to the public. However, mass media coverage is not always neutral, and one must consider ideological factors that affect the production of media content. Moreover, the evaluation of media coverage, particularly global firms must not be limited to national boundaries or global media printed in English (Freitag, 2002). This project uses a combination of case studies of five organizations that operates in the U.S. and China, as well

as a content analysis of the media coverage of these companies in both countries, to determine how the portrayals of the companies are different based on the language and place of publication.

§§§§

Category: Social Sciences
Name: Kyoko Rice
Submission Type: individual
Faculty Sponsor(s) & Department(s): David Lavond, Psychology
Format: Senior Honors Project
Title: Replicating Clever Hans Phenomenon
Abstract: In 1904, Pfungst successfully demonstrated that a horse named Clever Hans did not think independently but the horse was responding to subtle unconscious cues from his owner and other humans. The proposed study intends to replicate the Clever Hans phenomenon as described in Oskar Pfungst's publication with the deliberate use of modern operant conditioning techniques.

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Category: Social Sciences
Name: Mala Gurbani
Submission Type: individual
Faculty Sponsor(s) & Department(s): Jo Ann Farver, Psychology
Format: Senior Honors Project
Title: Effects of Maternal Smoking on Children's Aggression
Abstract: The proposed study is an attempt to determine the prenatal and postnatal effects of maternal smoking on children's aggression at ages 9-10 years

old. This study will be conducted in the context of a larger twin study investigating the biological and social risk factors for aggression and antisocial behavior. Data collection has already occurred for most of the participants in the study, which include 600 twin pairs (both monozygotic and dizygotic) and their primary caregivers (91.2% biological mothers). Nine and ten year old twins participate in the comprehensive assessment, including tasks that measure cognitive ability and various interviews and surveys concerning their own behavior. Psychophysiological measures of autonomic arousal and brain activity are also assessed in the children. Caregivers provide additional information about each twin's behavior, as well as about their own behavior, including substance use during pregnancy and in the past year.

This study is important because to date, there is very limited research done on the effects of maternal smoking on children's behavioral outcomes later in life. If harmful effects are found on children's behavior as a result of maternal smoking, significant changes should be made to increase public awareness about these results.

§§§§

Category: Social Sciences
Name: Christopher Delaney
Submission Type: individual
Faculty Sponsor(s) & Department(s):
Jennifer Overbeck, Management and Organization
Format: Senior Honors Project

Title: Losing Prestige: Antecedents to Status Loss in Self-Directed Teams

Abstract: Three studies (two laboratory and one field study) examined status loss decisions within task groups and organizations. The studies show that group leaders (high-status members) lose status if they are not group aligned, they exercise too much or too little of their granted authority, or if they prove to be incompetent. In our 1st study, participants revoked status from unassigned group leaders if he/she lacked competence and if he/she failed to listen to input from other group members. Study 2 was a more controlled study, in which participants reported that the amount of power exercised by a group leader and the alignment of that individual to the organization's (group aligned vs. not-group aligned) interests predicted status loss. For Study 3, in-depth interviews were conducted with real world executives and academic professionals who have held positions of power and status. This study provided additional support for our findings in Study 1 and 2 and provided insight for future research.

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Category: Social Sciences
Name: Susan Slater
Submission Type: individual
Faculty Sponsor(s) & Department(s):
Susan H. Evans, Keck - Institute for Prevention Research; Peter Clarke, Annenberg School for Communication; Eduard Hovy, Vitterbi School of Engineering - ISI
Format: Field Research
Title: Quick! Help for Meals - A Validity Study

Abstract: Thirty four million Americans live below the poverty line -- many more suffer from food insecurity. Low/no income populations have limited access to and consume fewer fresh fruits and vegetables. With advances in technology improving access to health information, tailored health communications are gaining support as an effective method for improving health behaviors. To this end, Quick! Help for Meals was created from an interdisciplinary partnership between experts in health education, communications, and computer science.

Quick! Help for Meals provides a tailored recipe booklet to food pantry clients with preparation tips for vegetables they receive that day. This method helps assure that these foods will be consumed because pantry clients will receive the information they need just when the need arises. Preliminary data indicate that those who receive the Quick! Help booklet tailored to their food tastes, cooking experience, household size and available kitchen facilities do consume more fresh fruits and vegetables than those given generic information.

Measurement of Quick! Help for Meals as a health education intervention required that a new variable be created that could gauge improved consumption of fresh fruits and vegetables. A "days & ways" variable examined whether those who received the Quick! Help materials prepared fresh foods on more occasions and in more varied ways than those who received generic material. This study asked if the days and ways variable was a valid measure of intervention efficacy.

Data analysis indicates that the "days and ways" variable is valid measurement of increased consumption of fresh foods.

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Category: Social Sciences

Name: Kevin Swartz

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Theodore J. Mock, Accounting

Format: Field Research

Title: An Examination of the Various Levels of Assurance provided in Corporate Sustainability Reports

Abstract: With the recent accounting scandals, many firms are disclosing more than just financial figures to satisfy the investors' need for greater transparency. The need for greater disclosure has precipitated the boom of Sustainability Reports and has made it one of the newer topics in today's modern accounting age. With an increasing number of companies worldwide choosing to issue sustainability reports, it is important to discover what is being done to protect the users of these new reports from being misled. The accounting profession is giving assurance on these reports and it is imperative to examine how the profession is giving assurance and what levels it is being given at. Because of the novelty of Sustainability Reports, my research gives a background about what it is including why companies issue these reports and the guidelines they use. The more empirical second part of this research examines the levels of assurance the audited reports provide. A detailed analysis of over 100 assured reports issued from the companies' 2003/2004 Sustainability Reports

provides a foundation for the research. Included in the research was how the firms assured these reports by examining what frameworks are used by the auditors and do certain frameworks produce different levels of assurance. Finally, investigating what firm provided the assurance and if there is any correlation between audit firms and levels of assurance provided (Big 4 vs. local firms). Research on these basic questions will provide the profession with practical knowledge of how others are conducting assurance services for these reports.

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Category: Social Sciences

Name: Laurie Casey, Lewis Lawyer, Celeste De Freitas

Submission Type: group

Faculty Sponsor(s) & Department(s): Toben H. Mintz, Psychology; Rachel Walker, Linguistics

Format: Laboratory-based Research

Title: Piecing It Apart: Infants Using Vowel Harmony as a Tool for Sentence Parsing

Abstract: In order to learn a language, children must first learn to distinguish individual words. Pauses rarely occur between words in natural speech, so how does a child determine where each word begins and ends? Our study explores one of the many tools that children might use to parse sentences.

The property of vowel harmony, present in languages such as Turkish and Hungarian, dictates that within any given word all vowels have something in common. For example, in Turkish and Hungarian words certain vowels must

match in lip rounding—the sounds “oh” and “oo” are round, but “ee” and “eh” are not. For children trying to find word boundaries, vowel harmony could be a very useful tool: where one word ends and another begins can be marked by a change in the vowels.

Our research shows that children raised in an English-speaking environment are sensitive to vowel harmony cues. Utilizing the Head-turn Preference Procedure (Fernald 1985), we were able to determine that seven-month-old infants differentiate between harmonic and non-harmonic words. The infants looked toward speakers playing harmonic words longer than they did toward speakers playing disharmonic words.

This behavior of English-speaking children might seem surprising since English does not have vowel harmony. Why are English-speaking infants responding to vowel harmony cues? Current studies aim to further explore this question, but preliminary results suggest that infants might be universally predisposed to use harmony as one of several cues for word segmentation.

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Category: Social Sciences

Name: Rebecca Blank

Submission Type: individual

Faculty Sponsor(s) & Department(s): Thomas D. Lyon, Law, Psychology

Format: Senior Honors Project

Title: Emotional Responses in Children’s Disclosure of Sexual Abuse

Abstract: The purpose of this study is to determine if the evaluative content of

children's disclosure of sexual abuse is affected by the types of questions asked. The study analyzes disclosure interviews of 32 children ages 6 – 12, which were carried out with social workers at the Violence Intervention Program. The hypothesis is that children disclosing sexual abuse are unlikely to spontaneously refer to emotional and other evaluative reactions, but are capable of describing such reactions when asked direct questions. The practical application of this research is to improve the process by which children's sexual abuse disclosures are evaluated by third parties, such as jurors in a court of law.

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Category: Social Sciences

Name: Erika North

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Norman Miller, Psychology

Format: Senior Honors Project

Title: I've Got Your Back: Motivations for Retaliation within the Vicarious Retribution

Abstract: The proposed study will examine the different motivations for retaliation against an out-group provocateur based on attachment styles to the in-group in the context of the Vicarious Retribution model.

Attachment to group members through a common-bond relationship is expected to produce empathy for the group member who is attacked. Attachment to the group through a common-identity relationship is expected to produce feelings of injured pride after witnessing a fellow group member being attacked. Empathy and pride are the hypothesized

motivations for the retaliation against the out-group provocateur. Participants will read vignettes where they will be asked to image an attack on either a close friend who does not go to USC (bond only), on a USC student the participant does not know (identity only), on a close friend who does go to USC (both), or on a complete stranger (neither). The participant will then be asked to answer questions assessing desire to retaliate, attachment type and emotional affect. The design of the study is a 2 (common-bond attachment: yes, no) x 2 (common-identity attachment: yes, no) between-subjects design. The prediction is that empathy will mediate the relationship between common-bond groups and retaliation, while pride will mediate the relationship between common-identity groups and retaliation.

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Category: Social Sciences

Name: Alexis Asatourian

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Mitchell Earleywine, Psychology

Format: Senior Honors Project

Title: Dispositional Aggression's Effects on Alcohol Consumption, Alcohol Expectancies and Aggressive Behavior

Abstract: The association between alcohol and aggression has been extensively researched, however, fewer studies account for the cognitive and dispositional factors that may influence alcohol consumption and the resulting aggressive behavior. This study measured the association between dispositional aggression, explicit and implicit expectancies, alcohol

consumption and the reported aggressive behavioral outcomes. Residents of a large, urban and ethnically diverse metropolitan city participated in the study (N = 246). Participants completed a timed computerized task, the Implicit Association Test (IAT) in addition to paper and pen questionnaires assessing alcohol expectancies and dispositional aggression. It was hypothesized that the greater the individual's disposition for aggression, the greater the expectancy for drinking alcohol, and the more likely the participant would behave aggressively when intoxicated. The data for dispositional aggression and alcohol expectancies were significant, yielding correlations of ($r = .41$) for physical aggression, ($r = .19$) for verbal aggression, ($r = .36$) for anger, and ($r = .34$) for hostility. In addition, individuals who reported drinking a greater number of alcoholic beverages on a single occasion were found to have higher alcohol expectancies ($r = .30$) and to act more aggressively ($r = .47$) than those individuals who reported drinking a fewer number of drinks per occasion, but a greater number of times per month ($r = .11$). The existence of a binge-drinking component can potentially redirect future research and preventative programs by encouraging them to focus their efforts on the quantity rather than frequency of alcohol consumption.

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Category: Social Sciences
Name: Sophia Tabaroki
Submission Type: individual
Faculty Sponsor(s) & Department(s):
Carol Koproski, Health Promotion and Disease Prevention

Format: Creative Work

Title: The Benefits of Physical Activity

Abstract: Exercise and a diet low in fat lowers the possibility of developing heart disease, stroke, diabetes, and some cancers.

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Category: Social Sciences

Name: Jennilee Tuazon

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Richard F. Thompson, Psychology,
Biological Sciences

Format: Senior Honors Project

Title: Effects of AP5 on Extinction of the Rabbit's Classically Conditioned Response

Abstract: Classical conditioning of the eyeblink response has proved to be a most useful model for analysis of both behavioral and neural aspects of learned responses in mammals. While it is well established that the cerebellum and its associated circuitry are essential for acquisition of discrete motor responses, brain mechanisms underlying extinction of these responses are less clear.

Previous studies have found NMDA receptors to be involved in the acquisition and retention of a number of learning tasks, including eyeblink conditioning. As for eyeblink extinction, several substances have only been administered systemically so it is not possible to localize their effects on brain structures. This study examines this question more directly by blocking NMDA receptor functioning in the interpositus nucleus (IP), a cerebellar structure known to be essential in eyeblink conditioning. After reaching asymptotic conditioned response (CR)

levels, infusions of the NMDA antagonist, AP5, were administered into the IP of animals during four consecutive extinction sessions. Results revealed that animals in the AP5 group exhibited significant accelerated rates of extinction compared to saline controls. These data indicate that NMDA receptor activity is involved in the extinction of eyeblink conditioned responses and supports the view that extinction is not simply the fading away of a memory but, instead, an active learning process.

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Category: Social Sciences
Name: Brian Riff, Lucy Flores, Sally Handmaker
Submission Type: group
Faculty Sponsor(s) & Department(s): Ann Crigler, Political Science; Christopher Weare, Policy, Planning and Development; Juliet Musso, Policy, Planning and Development
Format: Field Research
Title: Networks of Civic Engagement
Abstract: An essential requirement for a meaningful and sustained civic engagement is a committed public with a capacity for involvement in the governance process. It is these acts of civic engagement, whether it is in local or national clubs and organizations, which link the citizens to the greater good of the community. The goal of this project is to analyze a faith-based community organization in order to examine not only the social structure of the organization but also how this organization helps link its members to the Los Angeles city government and school board. A social network methodology will be used to test not

only the strength of the connections within the faith-based organization but also its outward ties to the community.

Additionally, levels of satisfaction and sense of efficacy towards the overall mission of this organization will be evaluated. A series of surveys and semi-structured interviews have been conducted at various levels of the organization; on both the service provider and service receiver side to obtain the necessary data.

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Category: Social Sciences
Name: Rachel Cody
Submission Type: individual
Faculty Sponsor(s) & Department(s): Jo Ann Farver, Psychology; Elana Gordis, Psychology
Format: Senior Honors Project
Title: The Relationship between Maltreatment and Autonomic Dissociation
Abstract: In this study, we investigated the relationship between maltreatment, sympathetic arousal, and autonomic dissociation. Research has indicated that maltreatment is linked to physiological and psychological problems and that an overactive sympathetic nervous system can lead to stress and hyper-vigilance. Although most people experience emotional arousal that is in sync with their physiological arousal, there are some who have a discrepancy between the two, reporting low emotional arousal, but experiencing high physiological arousal. While the effects of this autonomic dissociation are debated, research has indicated that it may be beneficial in coping with

traumatic events. To investigate autonomic dissociation in maltreated children compared to non-maltreated children, 207 participants aged 10 to 14 viewed film clips designed to elicit emotional responses. Recordings of sympathetic arousal were made during the film and then compared to the participants' self-reported emotional arousal. No overall significant difference was found for autonomic dissociation between the two groups, although there was a significant difference for sex and for the interaction between group and sex. Among dissociators, there was a significant difference for group, with the maltreated group having higher dissociation scores.

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Category: Social Sciences
Name: Sima Mostafavi
Submission Type: individual
Faculty Sponsor(s) & Department(s): Jo Ann Farver, Psychology; Norman Miller, Psychology
Format: Laboratory-based Research
Title: Reducing Triggered Displaced Aggression through Self-Disclosure
Abstract: We have all experienced an unexpectedly high retaliatory aggressive response to a trivial provocation of another individual. This inappropriate aggressive response exceeds the socially expected tit-for-tat matching rule. The concept of triggered displaced aggression can explain these unusual cases. Past research shows that out-group targets are more likely to experience triggered displaced aggression. This experiment confirms the hypothesis that disclosure of personal information by an out-growth

target will reduce triggered displaced aggression towards that individual. Participants were randomly assigned to two conditions, self disclosure by the supposed partner or no self disclosure. In the self-disclosure condition, the real participant received a fake letter from her/his partner, the partner talked about her difficulties adjusting to college life in this letter. Participants in the self-disclosure conditions scored lower on the aggression scale.

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Category: Social Sciences
Name: Caroline Savage
Submission Type: individual
Faculty Sponsor(s) & Department(s): John Odell, International Relations; Robert English, International Relations
Format: Senior Honors Project
Title: Regional Choice in Central Asia
Abstract: Building on Neumann's region-building approach, this project develops the concept of regional choice using the case study of Central Asia. Traditional regional definitions are not always adequate in the every-changing system of international relations, especially in light of the paradigm shifts following the end of the Cold War. Nations do occasionally distance themselves from their perceived "natural partners" in search of alternative relationships in their proximity. In their early years of independence, Kazakhstan chose to cooperate with the other Central Asian Republics (CARs) and the Commonwealth of Independent States (CIS), while Turkmenistan demonstrated a clear preference for association with the southern rim, Iran, Afghanistan, Pakistan and Turkey. The different

choices of two states emerging from such a similar and unique background, and the academic reaction to their disparate behavior in Central Asia is a significant and relevant example of the hitherto limiting nature of regional approaches. This study asserts that Turkmenistan and Kazakhstan made regional association decisions largely based on the same four variables, they simply chose different regions. Regional choice is determined by a nation's considerations of the strategic utility, leadership potential, economic utility and to a lesser extent, cultural and historical connections they perceive to gain from the association. Ordinal scales are developed through the study to further demonstrate the findings.

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Category: Social Sciences

Name: Alex Aftandilians

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Steven Lamy, International Relations

Format: Creative Work

Title: Acknowledging Sudan

Abstract: Until 1820, Sudan existed as a collection of independent kingdoms and principalities. Most of the north had been settled by Arabs while the south was predominantly occupied by various black African tribes. The country was conquered in 1821 and remained under total foreign control until 1953, when the United Kingdom and Egypt agreed upon a framework for Sudan's self-governance. The southerners' expectation of a federal system for the newly independent nation was betrayed by the Arab controlled government in Khartoum. Sudan was immediately

embroiled in a bloody civil war that endured for 17 years. A peace settlement was negotiated in 1972, but the concord would last only until 1983, when Khartoum's leadership instigated the predominantly Christian south by implementing Shari'a law throughout the entire country. The civil war has raged ever since and nearly 2 million lives have been lost amidst the fighting.

Today, Sudan remains the world's most serious humanitarian crisis. While a potential settlement between the Khartoum government and southern rebels seems promising, an entirely new crisis has emerged in previously peaceful regions of Sudan. Government supported militias have burned entire villages, destroyed food and water supplies, and sexually assaulted women and children. Since March 2003, nearly 1.6 million people have been forced to flee from their homes, with 200,000 taking refuge in neighboring Chad. International efforts, however, have remained tenuous. Limited public discourse and media coverage, furthermore, illustrate that the world's gravest humanitarian crisis has not been fittingly acknowledged.

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Category: Social Sciences

Name: Christopher Cunningham

Submission Type: individual

Faculty Sponsor(s) & Department(s):

John Odell, School of International Relations; Gerald Bender, School of International Relations

Format: Senior Honors Project

Title: Assessing Comparative Advantages: Regional Organizations and the United Nations

Abstract: The end of the Cold War saw the emergence of more dynamic and capable regional organizations, the of rise failed states as a persistent threat to international stability, and the increased reliance on peacekeeping and humanitarian military intervention. These factors contributed to the development of scholarship on burden sharing between regional organizations and the United Nations as a means of generating more effective conflict resolution. Though hypothetical statements have been made regarding which distinct comparative advantages different organizations are expected to have, little research has gone into how these advantages are manifested. This project examines two of most commonly articulated theoretical assumptions; First, that a regional organization's incentive to intervene in a crisis situation is at a comparative advantage to the United Nations; and second, that a regional organization's knowledge of a crisis situation is at a comparative advantage to the United Nations.' These two assumptions were investigated in the African context of the military interventions in Liberia and Somalia which were respectively undertaken by the Economic Community of West African States (ECOWAS) and the United Nations. While a significantly greater level of incentive was determined to exist in ECOWAS' intervention, no clear comparative advantage was observed regarding a regional organization's knowledge. This unexpected conclusion calls into question the widespread assumption that

local actors have a superior understanding of crisis situations.

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Category: Social Sciences

Name: Bryce McFerran, Jocelyne Liu, Vivian Lim

Submission Type: group

Faculty Sponsor(s) & Department(s): Alexandra Michel, MOR

Format: Laboratory-based Research

Title: Around the Mental Block: Cognition as Resource Organization

Abstract: This project examines how one's self-concept influences how one interacts with available cognitive resources, including mental and behavioral resources, task-structures, and objects. While traditional cognitive theory suggests a conception of cognition as an isolated activity which occurs primarily in the brain in the form of mental representations, our research, grounded in socio-cultural and phenomenological theory, indicates that thinking is a social process which involves organizing a variety of available cognitive resources. We argue that cognitive theory and socio-cultural theory are not just explicit, scientific theories but also implicit theories that people enact in their daily life, most notably as part of their self-concept. In a laboratory experiment, we induced these distinct theories in the form of two types of self-concepts: (1) identity, which oriented people to think of themselves as separate entities responsible for generating cognitive outcomes, and (2) direct involvement, which oriented people to think of themselves as being involved in a social cognitive process. We investigated how these different self-

concepts caused the participants to organize cognitive resources with differential effectiveness. Results indicate that subjects in the direct involvement condition organized cognitive resources more effectively because they effectively noticed cues for action and avoided an escalation of commitment to a single course of action. Our work points to a theory of cognition as a process of resource organization (versus the generation of mental representations), which holds across different levels of analysis, including people, groups, and organizations. We discuss implications for performance-enhancing interventions at the individual and collective level.

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Category: Social Sciences

Name: Carlos Bello

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Steve Madigan, Psychology

Format: Field Research

Title: Investigations of Creativity and Cultural Lingo through Word

Associations

Abstract: A new measure for creativity and for cultural idioms is currently in the process of development at USC in accordance with principles of the early Remote Associate Test (RAT), which was the original form of assessing creativity in participants through their knowledge and competence in contemporary English vocabulary. The main emphasis of this study is vocabulary size and retrieval capacity as an indication of an individual's ability to

associate word clues in order to generate a word or cultural idiom of interest. Preliminary assessments of college students at USC and other universities in the area have provided some data that have evaluated the original RAT designed by Sarnoff Mednick. Data has shown which words from the early RAT are culturally obsolete and or very obscure and which words or idioms have medium and high recall associations. In the process of using the original RAT, we have been able to filter out words from both extremes in order to identify words and phrases of moderate to low recall rates in order to characterize a lingo of a contemporary culture. Efforts to generate word norms (or recall strengths) are currently underway and will provide valuable information about word familiarity and a source of words for future RATs. Comparison of the main effects of various measured variables such as multicultural factors has provided insight that English learned at an early age may be crucial in later performing well on measures of creativity that take into account one's familiarity with English.

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Category: Social Sciences

Name: Mark Awad

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Bruce Zuckerman, Religion; Lynn

Swartz Dodd, Archeology

Format: Laboratory-based Research

Title: Ancient Jewish Coins

Abstract: The Archeology department owns several coins from various eras of

Jewish history and, with the help of Professor Dodd and Professor Zuckerman, I undertook to investigate one of these coins. The coin chosen came from the first great Jewish revolt against the Romans and provided, with conjunction with other research, a wealth of information on cultural and religious aspects of Jews at that time as well as a reflection of the political climate and friction with the Romans. I also attempted to creatively interpret the coin on its own and understand the physical damage done to it throughout its existence.

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Category: Social Sciences

Name: Michael Directo, Miranda Love, Nathan Go

Submission Type: group

Faculty Sponsor(s) & Department(s): Bradley Zebrack, School of Social Work;

Format: Field Research

Title: Psychosocial Issues of Young Adult Survivors of Childhood Cancer

Abstract: Research on young adult (18-40yrs) childhood cancer survivors is relatively non-existent despite the extensive research on children and older cancer survivors. Ironically, 1 in 900 childhood cancer survivors are young adults (Oeffinger 2004). As a result, research interest to study health-related cancer problems for young adults has risen. This study took a qualitative approach by speaking with young adult cancer survivors about their quality of life through focus groups as well as one-on-one interviews. Through funding by

National Institute of Health/National Cancer Institute we were able to investigate the psychosocial issues of young adult cancer survivors. Our sample contains 36 interviews, which consisted of (47.2%) males and (52.7%) females, the average age was 22.2yrs (males) and 23.4yrs (females), and the focus group had 18 female and male participants ranging from 13-35yrs. All participants came from the southern California area. We were able to extrapolate that survivors need programs that address our three focuses: Education, Self-Identity, and Relationships, from the transcriptions and literature review. We found that there is a lack of programs that address these issues with young adults. In addition, the programs that do exist have their own problems such as: location, frequency of meetings, and facilitation of topics of interest. We suggest there not only be intervention programs but also services more suitable for young adults needs. With this sort of intervention young adult survivors can be better educated about their treatment and late effects, and can receive adequate counseling on relevant matters, thus improving their quality of life.

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Category: Social Sciences

Name: Daniel Ballon

Submission Type: individual

Faculty Sponsor(s) & Department(s): Stan Huey, Psychology

Format: Senior Honors Project

Title: The Role of Therapist Adherence in Relation to Treatment Risk and Outcomes

Abstract: Research shows that therapist adherence to treatment protocol is an essential mechanism of change in MultiSystemic Therapy (MST), a clinically supported intervention for youth presenting serious clinical problems. However, the literature also suggests that characteristics of the youth and the family prior to treatment can affect the level of therapist adherence. Questions still remain about how pretreatment "risk" is related to adherence and what affect in turn this has on treatment success. The current project used data from a recent clinical trial of MST with substance abusing juvenile delinquents to attempt to explore this issue. Target youth and their families were assigned by the Juvenile Justice System, after a drug-related arrest, to a probation office. Families were then assigned to either MST or usual services conditions. Target youth and their primary caregivers completed assessment packets measuring a broad range of potential risk factors at three points in time: prior to beginning treatment (T1), during the course of treatment (T2), and two months after treatment had ended (T3). During these three assessment periods, youth were also required to take urine tests to test for drug use. Analyses show that risk affects treatment outcomes in a cumulative fashion such that the greater the number of risk factors a family has the less likely they are to respond to treatment. Furthermore, the data suggests that therapist adherence may

moderate this relationship such that a high degree of therapist adherence, despite the level of risk, ameliorates the negative effects of risk on outcomes.

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Category: Social Sciences

Name: Rosella Cappella

Submission Type: individual

Faculty Sponsor(s) & Department(s):

John Odell, International Relations

Format: Senior Honors Project

Title: Cohesiveness of Developing Country Coalitions in the WTO: A Comparative Analysis

Abstract: Although scarcely focused on, developing country coalitions in the World Trade Organization are a fixture in the multinational trade negotiation arena. The success of these coalitions allows disadvantaged developing countries to create a more level playing field in trade negotiations and thus, reap the benefits of economic liberalization. However, success is scarce as more resourceful and powerful developed countries use divide and rule tactics which in turn force these groups to fragment. This paper studies under what conditions and strategies developing country coalitions remain cohesive. It demonstrates that the group's identity, number of issues on its agenda, its external negotiation strategy, and its defection response mechanisms determine the degree of cohesiveness the group experiences. This work will take a comparative look at the Like Minded Group which fragmented in November of 2001 at the Doha Ministerial in Qatar and the Group of 20, also of the Doha Round, which experienced a high degree

of cohesiveness and success at the final round of negotiations for 2004.

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Category: Social Sciences

Name: Jun Han Tan

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Martin Krieger, SPPD

Format: Field Research

Title: Documenting the Urban Sensorium

Abstract: This is a speculative experiment, a chance to extend documentary work into the realm of multimedia and installation. Using traditional techniques of video and film work, this project strives to record the visual and aural sensations of the ethnic neighborhood of Boyle Heights. In essence, this project tries to capture the experience of a vibrant streetscape and community, in order to aid the understanding and archiving of current urban conditions. It aims to enhance urban and city planning work by relying on multimedia elements to recreate the physical and sensory experience of an urban locale.

Representing the city and conveying the experience of the city has been an important concern for the field of urban planning for more than 150 years. Intended as an installation work rather than a narrative film, this project works to evoke the rapidly changing Boyle Heights for planners and urban sociologists today and in the future. Using both static and moving camera work to capture the streets of Boyle

Heights at different times of the day and days of the week, this experiment attempts to find solutions to the problem of representing city life and the difficulty in creating the verisimilitude of a living urban landscape.

It is a work-in-progress that examines the serious theoretical and practical questions surrounding the experience of walking down a street and the sense of place.

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Category: Social Sciences

Name: Katherine Jackson

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Michael Dawson, Psychology

Format: Senior Honors Project

Title: Test-Retest Reliability of the Degraded Stimulus Continuous Performance Test

Abstract: This study examined the test-retest reliability of the Degraded Stimulus Continuous Performance Test (DS-CPT) with a memory component. Continuous Performance Tests (CPTs) are used to investigate sustained attention in participants. They have been shown to detect vigilance deficits in individuals, in particular schizophrenia patients. Various versions of the CPT have been utilized in schizophrenia research; however, studies had not yet employed the DS-CPT with a memory component. This study investigated the reliability of this task using the performance scores of 40 normal college participants and 30 schizophrenia patients. Participants were tested on two different occasions approximately one week apart.

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Category: Social Sciences
Name: Brittany Hall
Submission Type: individual
Faculty Sponsor(s) & Department(s):
Stanley Huey, Psychology
Format: Field Research
Title: Racial Differences in Resistance
Abstract: To the bafflement of many practitioners, between 30-60% of clients fail to adhere to the treatment they have sought. Despite its widespread occurrence, client resistance has not been well explored in the behavioral literature and little empirical evidence documents the phenomenon. Minority clients, especially African Americans, are thought to exhibit especially high levels of resistance. However, a large part of behavior deemed resistant may be the result of cultural differences, norms, and expectations of therapy. Data will be coded using the Therapy Process Code, which operationalizes eight categories of resistant behavior and one category of nonresistant behavior. The present study seeks to test the model of the curvilinear struggle-and-working-through hypothesis of resistance to a population receiving Multisystemic Therapy. The relation between resistance levels during therapy and reduced delinquency outcomes will be examined and whether ethnic match between the therapist and the client has any effect. Secondary hypotheses evaluate whether African-American and Caucasian families demonstrate different patterns of resistance.

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Category: Social Sciences
Name: Ashley Sands, Claudia Zhang
Submission Type: group
Faculty Sponsor(s) & Department(s):
Lynn Swartz-Dodd, Religion
Format: Laboratory-based Research
Title: Archaeological Research from Kenan Tepe
Abstract: A team of USC undergraduates collaborates with archaeologists to explore religion and technology at a major archaeological site in Turkey.

Around 1800 BC, a unique furnace burned to 1200°C exploding into a melted heap. This disaster affords the opportunity to address important questions about ancient technology including (1) how these high temperatures were achieved so early (2) the furnace's function (3) the relationship between ancient technology and the ritual activity we hypothesize occurred there.

This project is ongoing and showcases two years of research into slag and metal from the site. We initially hypothesized that the furnace was used for metal smelting. However, careful studies in USC's Archaeological Research Collection laboratory led us to reject this hypothesis. Our new hypothesis is that this furnace was a firing chamber of a huge kiln located within a sacred precinct. Animal figurines were excavated outside the furnace and we recently identified micro-drills, obsidian and animal bone within the structure. These finds lead us to suspect that this structure was associated with craft

activities in which ritually significant meaning was added to raw materials. In order to unravel the mystery of the unique furnace, we continue to look ever-closer at the material remains. Detailed material analysis and interpretation of archaeological contexts are required to recover the nature and surprising heat-making achievements of this site. This on-going project will continue uncovering clues that allow us to understand the relationship between ritual and technology at ancient Kenan Tepe.

an impending coup d'état, the tranquility between the troops and the masses seemed too good to be true. The following research project brings to light the overt and covert actions that maintained the peace in Kiev. A supplementary analysis of the funding of the revolution reveals the role that the United States, Russia and several international organizations and grass-roots movements played in the volatile struggle for the Ukrainian presidency.

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Category: Social Sciences

Name: Heidi Hardt

Submission Type: individual

Faculty Sponsor(s) & Department(s):

Ed Cray, Annenberg School of Journalism

Format: Field Research

Title: Ukraine's Peaceful Uprising: Why the Orange Revolution Never Turned Red

Abstract: In the two months after Ukraine's presidential election on October 31, more than half a million demonstrators camped out in Independence Square, transforming the streets of Kiev into rivers of glowing tents. Supporters of presidential candidate Viktor Yushchenko stuffed flowers into the metal shields of riot police and immersed themselves in a sea of orange banners and flags to protest an election tainted by fraud. Though the protests spread outward from the capitol, Ukraine's police force maintained a silent patrol over the crowd until the last day of demonstration. Amid rumors of



SYMPOSIUM PARTICIPANT INDEX

A

Abubakar, Saifudin; 25
Adams, Jason; 6
Aftandilians, Alex; 48
Andrade, Aaron; 8
Arianjam, Afshin; 15
Asad, Sameer; 6
Asatourian, Alexis; 44
Awad, Mark; 50

B

Bagwell, Sam; 29
Ballon, Daniel; 51
Barnard, Karen; 13
Bello, Carlos; 50
Bhagchand, Anmol; 21
Black, Laura; 21
Blank, Rebecca; 43
Blaschke, Melissa; 3
Boatman, Matthew; 24
Bokarius, Anna; 5
Bughi, Stephanie; 18
Busfield, Elizabeth; 5

C

Callaghan, Scott; 21

Campbell, Leticia; 34
Cappella, Rosella; 52
Carlton, Anthony; 21
Casey, Laurie; 43
Chai, Yi; 34
Chen, Chingyeh; 25
Cheng, Melanie; 14
Cheung, Pagee; 34
Chong, Suet Ying; 24
Cicccone, Marcia; 5
Clark, Jennifer; 11
Clermont, Brent; 33
Cody, Rachel; 46
Cook, Elizabeth; 34
Cunningham, Christopher; 48

D

Danielson, Cindy; 10
DeFreitas, Celeste; 43
Delaney, Christopher; 41
Directo, Michael; 51

E

Eshaghian, Sepideh; 4

F

Flores, Lucy; 46
Francoeur, Hunter; 21
Fujii, Emi; 28

G

Gale, Julianne; 1
Gill, BJ; 16
Go, Nathan; 51
Gupta, Akash; 13
Gurbani, Mala; 40

H

Hall, Brittany; 54
Hamirani, Ashiya; 8
Handmaker, Sally; 46
Haqqe, Ifraz; 21
Harden, Ebonee; 4
Hardt, Heidi; 55
Harris, Howard; 18
Hart, Andrew; 21
Hasircog, Christine; 3
Hassan, Nadia; 15
Hiler, Amanda; 15
Ho, An Heng; 40
Hoeft, Jeffrey; 23
Hulme, Jennifer; 20

I

Izumi, Eri; 38

J

Jackson, Katherine; 53
Jacobson, Noah; 29
Jarrett, Deborah; 25
Jone, Raymond; 13

K

Kaplan, Billy; 20
Kassimir, Spencer; 3
Krishnaswamy, Pavitra; 24

Kwok, Dorothy; 17

L

Lawyer, Lewis; 43
Lee, Jeffrey; 25
Lee, Michael; 35
Lee, Jasper; 35
Lee, Catherine; 37;
Lewis, Stephanie; 26
Lim, Vivian; 49
Liu, Jocelyne; 49
Love, Miranda; 51
Lydecker, Robert; 1

M

Maini, Rahul; 29
Martin, Renee; 1
Mason, Douglas; 30
McDonald, Sara; 5
McFerran, Bryce; 49
McGeary, Megan; 19
Mo, Ling Nam; 34
Mohaghegh, Sofia; 28
Mostafavi, Sima; 47
Mullen, Emily; 21

N

Newman, Burton; 27
Nguyen, Hieu; 29
North, Erika; 44
Nunez, Evan; 32

O

Oman, Lindsay; 2
Ooi, Ee Ling; 34
Oyakawa, Takehiro; 23

P

Paetzke, William; 21
Payzer, Gershom; 1

Phillips, Anthony; 9
Pierce, Brandee; 21
Popa, Patrick; 13
Prose, Ryan; 22

R

Revill, Kate; 3
Rice, Kyoko; 40
Rich, Jeffrey; 23
Riff, Brian; 46
Riggs, Daylen; 6

S

Sabat, Joseph; 12
Sanchez, Ninive; 35
Sands, Ashley; 54
Santillan, Eugenio; 9
Sauder, Grace; 3
Savage, Katherine; 26
Savage, Caroline; 47
Shahbaz, Adam; 3
Singer, Pamela; 32
Slater, Susan; 41
Small, Mallory; 39
Smith, Jeremie; 21
Smith, Matthew; 21
Softa, Ridhima; 17
Spaeth, Paul; 2
Sumcad, Jennifer; 18
Sun, Mu; 3
Swartz, Kevin; 42

T

Tabaroki, Sophia; 45
Tan, Jun Han; 53
Tang, Eric; 37
Tempongko, Josephine; 10
Tipton, Peter; 27
To, Christina; 30
Topic, Ian; 35
Torrance, Fiona; 39
Tsakoumakis, Jennifer; 20
Tuazon, Jennilee; 45
Tusler, Sophie; 1

V

Valvieja, Kym; 2
Vidhani, Karim; 21
Villalobos, David; 20
Villatoro, Alice; 36
Vo, Kieumai; 12

W

Williams, Lanita; 35
Wofford, Ashley; 15, 19
Wong, Curtis; 24
Wu, Melinda; 13
Wu, Christopher; 21
Wu, Dennis; 21

Y

Yamtich, Jennifer; 8

Z

Zhang, Claudia; 54
Zhu, Jiajun (Johnny); 34

PARTICIPANTS BY CATEGORY

ARTS

Gale, Julianne; 1
Martin, Renee; 1
Oman, Lindsay; 2
Payzer, Gershon; 1
Lydecker, Robert; 1
Spaeth, Paul; 2
Tusler, Sophie; 1
Valvieja, Kym; 2

HUMANITIES

Adams, Jason; 6
Asad, Sameer; 6
Blaschke, Melissa; 3
Bokarius, Anna; 5
Busfield, Elizabeth; 5
Cicccone, Marcia; 5
Eshaghian, Sepideh; 4
Harden, Ebonee; 4
Hasircog, Christine; 3
Kassimir, Spencer; 3
McDonald, Sara; 5
Revoll, Kate; 3
Riggs, Daylen; 6
Sauder, Grace; 3
Shahbaz, Adam; 3
Sun, Mu; 3

LIFE SCIENCES

Andrade, Aaron; 8
Arianjam, Afshin; 15
Barnard, Karen; 13
Bughi, Stephanie; 18
Cheng, Melanie; 14
Clark, Jennifer; 11
Danielson, Cindy; 10
Gill, BJ; 16
Gupta, Akash; 13
Hamirani, Ashiya; 8
Harris, Howard; 18
Hassan, Nadia; 15
Hiler, Amanda; 15
Jone, Raymond; 13
Kwok, Dorothy; 17
McGeary, Megan; 19
Phillips, Anthony; 9
Papa, Patrick; 13
Sabat, Joseph; 12
Santillan, Eugenio; 9
Softa, Ridhima; 17
Sumcad, Jennifer; 18
Tempongko, Josephine; 10
Vo, Kieumai; 12
Wofford, Ashley; 15, 19
Wu, Melinda; 13
Yamtich, Jennifer; 8

PHYSICAL SCIENCES, MATH & ENGINEERING

Abubakar, Saifudin; 25
Bagwell, Sam; 29
Bhagchand, Anmol; 21
Black, Laura; 21
Boatman, Matthew; 24
Callaghan, Scott; 21
Carlton, Anthony; 21
Chen, Chingyeh; 25
Chong, Suet Ying; 24
Francoeur, Hunter; 21
Fujii, Emi; 28
Haqqe, Ifraz; 21
Hart, Andrew; 21
Hoeft, Jeffrey; 23
Hulme, Jennifer; 20
Jacobson, Noah; 29
Jarrett, Deborah; 25
Kaplan, Billy; 20
Krishnaswamy, Pavitra; 24
Lee, Jeffrey; 25
Lewis, Stephanie; 26
Maini, Rahul; 29
Mason, Douglas; 30
Mohaghegh, Sofia; 28
Mullen, Emily; 21
Newman, Burton; 27
Nguyen, Hieu; 29
Oyakawa, Takehiro; 23
Paetzke, William; 21
Pierce, Brandee; 21
Prose, Ryan; 22
Rich, Jeffrey; 23
Savage, Katherine; 26
Smith, Jeremie; 21
Smith, Matthew; 21
Tipton, Peter; 27
To, Christina; 30
Tsakoumakis, Jennifer; 20
Vidhani, Karim; 21
Villalobos, David; 20

Wong, Curtis; 24
Wu, Christopher; 21
Wu, Dennis; 21

SOCIAL SCIENCES

Aftandilians, Alex; 48
Asatourian, Alexis; 44
Awad, Mark; 50
Ballon, Daniel; 51
Bello, Carlos; 50
Blank, Rebecca; 43
Campbell, Leticia; 34
Cappella, Rossella; 52
Casey, Laurie; 43
Chai, Yi; 34
Cheung, Pagee; 34
Clermont, Brent; 33
Cody, Rachel; 46
Cook, Elizabeth; 34
Cunningham, Christopher; 48
DeFreitas, Celeste; 43
Delaney, Christopher; 41
Directo, Michael; 51
Flores, Lucy; 46
Go, Nathan; 51
Gurbani, Mala; 40
Hall, Brittany; 54
Handmaker, Sally; 46
Hardt, Heidi; 55
Ho, An Heng; 40
Izumi, Eri; 38
Jackson, Katherine; 53
Lawyer, Lewis; 43
Lee, Michael; 35
Lee, Jasper; 35
Lee, Catherine; 37
Lim, Vivian; 49
Liu, Jocelyne; 49
Love, Miranda; 51
McFerran, Bryce; 49
Mo, Ling Nam; 34
Mostafavi, Sima; 47
North, Erika; 44
Nunez, Evans; 32

Ooi, Ee Ling; 34
Rice, Kyoko; 40
Riff, Brian; 46
Sanchez, Ninive; 35
Sands, Ashley; 54
Savage, Caroline; 47
Singer, Pamela; 32
Slater, Susan; 41
Small, Mallory; 39
Swartz, Kevin; 42
Tabaroki, Sophia; 45
Tan, Jun Han; 53
Tang, Eric; 37
Topic, Ian; 35
Torrance, Fiona; 39
Tuazon, Jennilee; 45
Villatoro, Alice; 36
Williams, Lanita; 35
Zhang, Claudia; 54
Zhu, Jiajun (Johnny); 34