



April 17, 2002

Dear Members of the USC Community:

It is my pleasure to welcome you to USC's Fourth 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 six categories.

- Arts
- Humanities
- Social Sciences I and II
- 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

Undergraduate Symposium for Scholarly and Creative Work

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ARTS

Name: Ms. Anna Bunina

Faculty Sponsor: John Bowlt

Category: Arts

Submission: Group

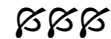
Format: Research Based

Title: Non-Conformist Artists of the Soviet Underground

Description: Our project is a web generated, trilingual (the text is in English, Russian and Italian) website exposing the life and work of Francisco Infante, one of the earliest and most active members of the non-conformist artistic movement in Soviet Russia. The creation of the website, is one of the efforts on the part of the faculty and students at the Institute of Modern Russian Culture to preserve a vital part of social and material history of the 20th century as well as to make that information available for scholarly research and inquiry.

This website is an important part of an ongoing research/archival project at the Institute of Modern Russian Culture (IMRC) entitled "The Other Art: Documenting Soviet Counter-Culture", the aim of which is to produce a catalogue raisonné (in electronic and printed form) of the large and unique collection of artworks, manuscripts, typescripts, correspondence, photographs, manifestoes, and publications pertaining to what is now known as the dissident movement in Soviet art and literature. So far, the Infante collection at the IMRC is the largest and most comprehensive of its kind outside Moscow (it is a part of the IMRC holdings located on the main USC campus in GFS 340). The diverse materials illuminate not only the career

of an internationally acclaimed artist, but also the ways in which the Soviet Union (and now the new Russia) defined the status and function of the creative intelligentsia.



Name: Ms. Sandra Chang

Faculty Sponsor: Janice Ledgerwood-McKenzie

Category: Arts

Submission: Individual

Format: Creative Work

Title: Willies

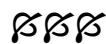
Description: When taking one material and putting it into a shape of another object, this changes not only the recognition of the object, but also the experience individuals have with the object. In this case, attaching human hair onto a cap makes the individual's contact with the cap different

When adding another layer to the cap, people view the cap differently because they bring the past experience of the object and the material and combine them mentally. For example, when people see this cap, they may not realize it is a cap immediately because the hair on it. Hair is the element that usually is under the cap, not on top of the cap. However, when people recognize that it is a cap, the reaction they have is – they wear it, because they knew that a cap is for wearing. That is how the material, the hair, changes the recognition of the object.

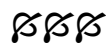
Why this cap gives people willies? It is because the past experience they have with hair. Their past experience with cap makes them realize that the cap is for

wearing. The willies people get from the hair may be from questions like – where does the hair come from? whose hair is it? how does the hair detach from the head? is the hair clean? These questions are generated from past experience people have with human hair, especially when the hair is detached from the head.

The combination of cap and human hair creates a tension between material and object form.

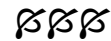


Name: Mr. Brian Fox
Faculty Sponsor: Robin Romans
Category: Arts
Submission: Individual
Format: Performance
Title: Transylvania Avenue
Description: Lately I've been writing short pop songs for acoustic guitar and voice, complete with catchy riffs and catchy lyrics. "Transylvania Avenue" is a group of four songs collected for the Undergraduate Symposium. My songwriting is influenced by Weezer's recent work, Neutral Milk Hotel, The Velvet Underground and Jude. This charming performance is dedicated to the poet Billy Collins.



Name: Ms. Jamie Greenberg
Faculty Sponsor: Robbie Conal
Category: Arts
Submission: Individual
Format: Art
Title: I Want My Dali!
Description: "I Want My Dalí!" is a ceramic sculpture built by hand and colored with acrylic paints. It is a narrative piece and intended to be a humorous play on the surreal artwork of Salvador Dalí. The piece stands

approximately 18 inches high and 12 inches wide. The "toddler" size of the doll is meant to give the piece a slightly queer quality yet the doll itself appears much more playful than any subject matter used by Dalí.



Name: Mr. Gino Guzzardo
Faculty Sponsor: Ron Rizk
Category: Arts
Submission: Individual
Format: Art
Title: Heirloom
Description: "Heirloom" explores the lingering effects of set ideals on a family. Through 4 panels, each of which signifies a generation, the ideal American 1950's family is deconstructed as its succeeding counterparts progress down the familial line. This transition from the romanticized model to its humble reality evidences a change in drawing style, composition, and visual translucency. The end result offers the viewer a more realistic portrait of a family that is not glorified by the artist and, consequently, becomes vulnerable to the viewer's gaze.



Name: Ms. Tanya Harry
Faculty Sponsor: Julia Paul
Category: Arts
Submission: Individual
Format: Art
Title: African-American Me
Description: My project is a series of six photographs that depict some of the inventions that African Americans have contributed to. My project does not presume to represent the specific make and model that was invented by these African Americans. However, it conveys that African Americans have

contributed to this area of inventions. The whole point is to look at ways in which African Americans have played a vital part in developing American culture beyond singing and dancing. These inventions are sometimes overlooked and or taken for granted. Although African Americans were not the only ones who contributed to the development of these inventions, it is important to know that they have played a part for educational purposes and to fight against some stereotypes of African Americans.

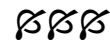


Name: Mr. Christopher Jones
Faculty Sponsor: Richard Meyer
Category: Arts
Submission: Individual
Format: Art
Title: Response #2
Description: The district surrounding Dodger Stadium illustrates one of the defining factors of Los Angeles – highly varied neighborhoods in a geographically small region. This piece is my response.

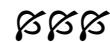


Name: Mr. Ryan Landels
Faculty Sponsor: Duke Underwood
Category: Arts
Submission: Individual
Format: Film
Title: The Midnight Express
Description: Written and directed by Ryan Landels during the Spring term of 2001, "The Midnight Express" is a short 16mm film that entertains while promoting strong family values. Completed as a project for the Cinema School's 310 class, this modern-day fairy tale tells the story of young Charlie Foster - a boy who takes matters into his

own hands when an overnight express train is rerouted through his bedroom. Offering its audience a round-trip ticket to childhood and back, "The Midnight Express" reminds kids not to be railroaded into growing up, while taking families to a place where a place where magic really can happen.

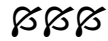


Name: Mr. Bear McCreary
Faculty Sponsor: Frederick Lesemann
Category: Arts
Submission: Individual
Format: Composition
Title: Sparks and Shadows
Description: This piece was conceived as a piece that would be brief, yet breathtaking. For all its brevity, the work has intense dynamics: the music moves swiftly, quiet passages giving way to sections of resounding volume. Darkness surges within the orchestration, punctuated by sudden brightness, creating the orchestral colors that inspired the title. Despite the contrasting colors -- the sparks illuminating the shadows - the rhythmic energy remains constant. This piece was composed in the Fall of 2001 under the direction of Dr. James Hopkins.



Name: Mr. Royal McGraw
Faculty Sponsor: Johanna Dematrakas
Category: Arts
Submission: Individual
Format: Film
Title: Cancer in my Pants
Description: CANCER IN MY PANTS is a documentary/re-creative documentary of the director's experiences with testicular cancer between his sophomore and junior years of college. This film juxtaposes tragedy

& comedy, objective fact & subjective experience, and love & growth into a unique look at the diagnosis and treatment of testicular cancer.



Name: Mr. Andrew Norman
Faculty Sponsor: Dr. Donald Crockett
Category: Arts
Submission: Individual
Format: Performance
Title: Overdrive for Four Virtuoso Violinists

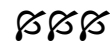
Description: “We declare that the splendor of the world has been enriched by a new beauty: the beauty of speed ... A roaring motor car that seems to run on machine-gun fire is more beautiful than the Victory of Samothrace.”F.T. Marinetti, Manifesto on Futurism, February 20, 1909. Only gradually as I was writing this piece did I figure out that it was about three things: baroque violin virtuosity, a futurist obsession with speed and mechanistic precision, and really fast cars. Once I mused for a while on these three subjects—and the distinctly Italian spirit they have in common—the piece took off. And that is precisely what the music itself does; from the opening gesture to the final bar it is headed in only one emphatic direction: up.



Name: Ms. Jennifer Park
Faculty Sponsor: Viet Nguyen
Category: Arts
Submission: Individual
Format: Creative Work
Title: Re Member
Description: Theresa Cha bases “Re Member” on the novel Dictée. Cha’s intention for this novel was to create a multimedia experience in a book format.

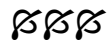
It is nonlinear, fragmented, and extremely unorthodox. While this makes this novel difficult to understand and experience, it is exactly this challenge that forces the reader to become active with the text in order to fully grasp the novel. “Re Member” produces a similar experience. Rather than communicating directly with linear navigation, it is through the finding clues, deciphering codes, and non-linear navigation that produce the point through the user's experience.

Whether it is due to language barriers, cultural hindrances, or painful memories, it is sometimes difficult for Asian Americans to trace family history. It is through this website navigation and coding that the user would ideally experience this process of finding or revealing the history. In order to reach the conclusion, it is up to the active user to break through all of the obstructions and challenges which make up the website.

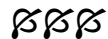


Name: Ms. Marcy Patterson
Faculty Sponsor: Don Hall
Category: Arts
Submission: Individual
Format: Film
Title: L'Amour Vive
Description: "The secret to life is knowing that beauty and great wisdom can be found in the simplest of moments." An inspiring quote, "L'Amour Vive" focuses re-creating those simple moments that are so dear to us. This film is a 16mm black and white short film that was made at USC during the fall of 2001. This is a love story about an elderly man who has been mourning his wife's death for over 30

years, before finally being reunited with her in heaven. Through a series of flashbacks, triggered by his wife's spirit, John is taken back to the past as he remembers special moments that the lovers shared together. It is these memories that make John's transition from heaven to earth more peaceful.



Name: Mr. Nate Perkins
Faculty Sponsor: Everett Lewis
Category: Arts
Submission: Individual
Format: Film
Title: Penitence
Description: Penitence is a black and white short, western film about a cowboy struggling with the guilt of his past.

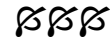


Name: Mr. Sebastien Roche-Lochen
Faculty Sponsor: Duke Underwood
Category: Arts
Submission: Individual
Format: Film
Title: Dark Focus
Description: What happens when four amateur witches gather around a table to participate in a séance and only one of them is really into it? What happens when they get distracted from chanting and their dreams become just too real? How far will someone go to get power? This 5:18 minutes movie will make you laugh, gasp, and will definitely give you the chills.



Name: Mr. Joel Schroeder
Faculty Sponsor: Everett Lewis
Category: Arts
Submission: Individual

Format: Film
Title: Ripe
Description: "Ripe" is a 6 min black and white 16mm non-sync film that deals with the experience of a man living in a nursing home as he confronts death.



Name: Ms. Arpine Shakhbandaryan
Faculty Sponsor: Bob Alderette
Category: Arts
Submission: Individual
Format: Research Based
Title: St. Ejmiatzin
Description: In August of 2001 Armenians from all over the world celebrated the 1700th Anniversary of Armenian Christianity as the National Religion. As a dedication for this very special event I created "St. Ejmiatzin."

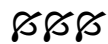
The Cathedral of St.Ejmiatzin was built in the 4th century. It is the seat of the Katholikos of the Armenian Church and is located in Vagharshapat, Republic of Armenia about 25 km from Yerevan. It is the church that I attended with my family before we came to America.

My composition consists of the Cathedral of St. Ejmiatzin as the central figure surrounded by decorations found in the Armenian Gospel Illumination Manuscript's. I have only included the main entrance. The entirety of the church contains the Palace of the Katholikos, a seminary, museum, refectory, synod house, library, printing house, monks' cells, and other auxiliary buildings.

Armenian Illumination Manuscript's are detailed works of art created during medieval Armenia. The first surviving miniatures date from the VI - VII

centuries, while the latest ones were created in the XIX century. Many of the manuscripts are stories from the Bible while others are influenced by folk life.

I studied these manuscripts, and from my research originated my own miniatures that I have incorporated into my composition. After 3 months of work, tedious attachment of gold leaf, architectural calculations, and obsessive attention to the fine detail I completed St. Ejmiatzin.



Name: Ms. Elizabeth Weigert

Faculty Sponsor: Karen Koblitz

Category: Arts

Submission: Individual

Format: Art

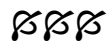
Title: Ceramic Expressions

Description: This is a show of ceramic works of art, some sculptural, some functional. Each piece has been crafted by hand with much effort to realize not only the aesthetic effect desired, but also to demonstrate the technical skill of the work. Several of these pieces challenge traditional ceramic conventions, bringing new light and blurring the line between functional pottery and decorative sculpture. Yet these creative expressions are not meant to be put behind glass, they are meant to be enjoyed by the senses. Many pieces are created with textures meant to be felt and explored. Each work of art is an original and individual artistic expression.



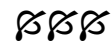
Humanities

Name: Mr. Aaron Bartels
Faculty Sponsor: Lynn Swartz Dodd
Category: Humanities
Submission: Individual
Format: Laboratory Research
Title: Ancient Imports and Instrumental Neutron Activation Analysis
Description: The focus of my website is to provide information about my ongoing USC undergraduate research project done in conjunction with Reed Colleges' Nuclear Reactor Facility. By collaboratively utilizing Reed's nuclear reactor for instrumental neutron activation analysis (or INAA) we have defined the chemical/isotopic composition of some ancient ceramic shards held at USC's Archaeological Research Collection. From there, it is possible to determine each artifact's provenance (manufactured origin) by comparing Reed's results with those of other professors and their related studies from around the world. Thus, by comparing pottery samples from USC with samples taken from clay mines and kilns, a better understanding of the pottery manufacturing centers and trade routes in the ancient world can be gained, specifically that of the Mediterranean and Near East.



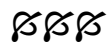
Name: Ms. Desarie Green
Faculty Sponsor: Richard Jewell
Category: Humanities
Submission: Individual
Format: Research Based
Title: Nigga
Description: My paper was written for my Censorship in Cinema class last semester. I researched whether or not in

this politically correct age of self-censorship if time has healed the wounds that it is okay to use the words "nigger" or "nigga" in any context. Also, is there really any distinction between the two words, and if so who has the right to use either?



Name: Mr. Kenneth Machida
Faculty Sponsor: Naomi Sawelson-Gorse
Category: Humanities
Submission: Group
Format: Research Based
Title: Notes on a Hilarious Battle
Description: One of the great enigmas in twentieth century art is Marcel Duchamp's The Bride Stripped Bare by Her Bachelors, Even (1915-1923), alternatively known as the Large Glass. Of the few known clues to the message of the Large Glass, the Green Box of 1934 is the most prominent. The Green Box contains 94 facsimiles of handwritten notes relating to the Large Glass and is - according to Duchamp - the missing link in interpreting that work. One of the few definitive facts gained from the Box is that the subject matter of the work centers on a sense of male sexual frustration. Aside from this insight, the contents of the Box are as mysterious as the Glass itself. Through our research, we have addressed many of the elusive concepts pertaining to the Large Glass, with the intention of comprehending the potential importance of this revolutionary work for modern society. By combining our original thoughts with those of published scholars, we have discussed the

complexities Duchamp faced in creating the Large Glass and the new methods of artistic expression that it necessitated, and we have related those complexities to overarching issues confronting Western society around the time of the First World War. Furthermore, we have offered our own personal interpretation of the Large Glass based upon information in the Green Box as well as the economic, political, and social conditions of the early 20th century to which Duchamp would have been well attuned.



Name: Ms. Jennifer Park

Faculty Sponsor: Viet Nguyen

Category: Humanities

Submission: Individual

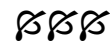
Format: Research Based

Title: Rape Me

Description: “Rape Me” is based on the novel, *Woman Warrior*, by Maxine Hong Kingston. In Kingston’s examples of the historical Chinese practice of foot binding, depending on the geographical context in which they are taken, she implies the inescapability of the “dysfunctional China” within the context of America. Although this dysfunction is seen through the lens of American culture, she is able to rectify her own American bias by laying these processes of dysfunction throughout her novel. In the novel, while bound women in China are able to free themselves from the metaphorical binds of power, women who are associated with foot binding in the context of America are seen as perpetually weak and are never able to escape their confines.

The degradation of the historical Chinese custom also indignifies the

culture as inferior to that of America. However, Kingston is not able to escape this “Chinese-ness” until the end of the novel. In this way, it is the American upbringing that rapes her idea of China and of Chinese customs. Although America often forgets its own deformed ideas of aesthetics, which are also illustrated in the website, it continually strips the meaning and history of other cultural practices into gruesome and irrelevant sideshows. “Rape Me” intends to analyze these instances in the novel, project information regarding the history and aesthetics of the practice, and point out America’s own aesthetic oddities in order to normalize the Chinese customs.



Name: Mr. Jonathan Schnereger

Faculty Sponsor: Lynn Swartz-Dodd

Category: Humanities

Submission: Individual

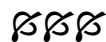
Format: Laboratory Research

Title: Iron Working at Kenan Tepe

Description: Last year a small number of metallurgical finds from excavations at Kenan Tepe in Southeastern Turkey were studied to determine what the nature of metal working at the site was. The recent excavation yielded significantly more finds which are being studied to investigate exact processes of metal manufacturing at the site.

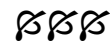
The samples were scientifically analyzed using SEM (Scanning Electron Microscopy) and PIXE (Proton Induced X-ray Emission) mapping in the Los Angeles California Museum of Art conservation laboratories, the Oxford laboratories and the USC CEMMA laboratories. The data were then compared with the results found during research conducted last year. These

processes revealed that we had low grade (a low percent of the object is iron) ferrous material, probably from the manufacturing process, and high grade (most of the object is iron) iron, which is still being examined. The most interesting information came while looking at the contexts that the iron came from. One area in which iron was found dates to the second millennium, the earliest phase of the Iron Age, making the iron possibly the oldest in the region. The project now turns to investigating the early iron found at the site to see what processes and materials were used to produce iron at such an early stage. On a broader scale, the project will also try and determine how Kenan Tepe functioned in the area in the early iron age and how it was used by dominating powers during the rise of the Assyrian empire.



Name: Mr. Suren Seron
Faculty Sponsor: Walter L. Williams
Category: Humanities
Submission: Individual
Format: Research Based
Title: The ONE List
Description: The ONE List is an ongoing digital information project that is constantly updated through continued research, located on the web at <http://www.theonelist.com>. It consists of a searchable, categorized, and multiple cross-indexed comprehensive website, listing all known current and historical figures and important persons that history, through scholarly research, personal interviews or writings, or other documents or methods of linkage, has shown to have had at least one significant same-sex relationship or been so inclined as to pursue one. The object

of this listing project is to provide a scholarly resource and an as-complete-as-possible archive of all such persons for the general use of the public, as well as academia, or any other interest that is in the pursuit of knowledge about these individuals. This list seeks to become the absolute online or Internet published list, meaning that, through continued development, investigation, research, and publishing, during and after the duration of this 490 Directed Research course, this list will surpass all others to be found online as the most complete and scholarly accurate list of individuals. The list contains figures from the past as well as the present, as long as any such figure that is included on this list has adequate scholarly linkage or published interviews citing a notable same-sex relationship or inclination to engage in a same-sex relationship. This information is cited as the factual linkage of any such figure to be included in the list, along with a short biography.



Name: Mr. Jonathan Vidar
Faculty Sponsor: Lynn Swartz-Dodd
Category: Humanities
Submission: Group
Format: Research Based
Title: The City of Troy
Description: Did the Trojan War actually occur? This project will analyze the validity of Homer's tale by comparing it with the archaeological evidence unearthed at the city of Troy VI. Discussions will include such topics as the history of oral tradition, a look at the mythology behind the Trojan War, excavations of the site itself, and our own interpretations of the material. The research will focus on the fortifications of the city and how these walls could

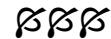
have sustained a ten-year war. We will depict our architectural findings through a self modeled computer rendering of the city that we will include along with all of our other research on an interactive web site of the completed project.

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LIFE SCIENCES

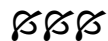
Name: Ms. Victoria Abraira
Faculty Sponsor: Albert Herrera
Category: Life Sciences
Submission: Group
Format: Laboratory Research
Title: Elimination of multiple innervation during embryonic development of frog skeletal muscle
Description: The persistence of memory in humans over many years suggests that experience has a critical effect on synaptic circuitry. At the neuromuscular junction (NMJ), monitoring such effects is possible since it is a simple and accessible synapse where structural changes can be readily observed. In the early stages of the embryonic development for frog muscle, each muscle fiber becomes contacted by an excessive number of motor neurons. Later, most of these synapses are eliminated to create the adult pattern, in which most fibers are innervated by a single motor neuron. In this project, experiments are arranged around three specific aims that explore the mechanisms of synapse elimination in the frog. The first aim is to document that the distributed and focal polyneuronal innervation pattern hypothesized to occur at tadpole stages undergoes synapse elimination to form the distributed mononeuronal innervation pattern of the adult. The second aim is to determine at what developmental stage this elimination occurs. The third is to provide a possible model for the mechanism of synapse elimination. Pectoral muscles of the *Xenopus laevis* at various stages were dissected and their NMJs labeled with a silver and cholinesterase stain to

assess focal and distributed innervation. Results suggest a possible mechanism for the elimination of polyneuronal innervation.



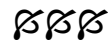
Name: Ms. Suchitra Ananthnarayan
Faculty Sponsor: Richard N. Bergman
Category: Life Sciences
Submission: Lynn Swartz-Dodd
Format: Senior Honors Project
Title: Alterations in Metabolic Gene Expressions in the Dog with Central Adiposity
Description: The mechanism by which increased central adiposity causes hepatic insulin resistance is unclear. Our hypothesis implicates FFA flux from the central fat depot to the liver via the portal vein. To test this hypothesis at the transcriptional level, we measured gene expressions in several tissue depots from the fat-fed dog model with central adiposity (Diabetes 49:2116, 2000). We examined central vs. subcutaneous depots and evaluated the gene expressions of the lipid-storing enzyme, lipoprotein lipase (LPL), and the lipolytic enzyme, hormone sensitive lipase (HSL). We also studied the expression of the two gluconeogenic genes phosphoenolpyruvate carboxykinase (PEPCK) and glucose-6-phosphatase (G6Pase). Small biopsies were obtained from the subcutaneous and central fat depots and liver (n=5) in dogs maintained for 12 weeks on moderately elevated fat intake (MFAT, 44%) vs. control (CON, 34%). Northern-Blot analysis revealed that the ratio of central/subcutaneous HSL (2.29

± 0.46 vs 1.28 ± 0.45 , $p < 0.05$) and LPL (2.32 ± 0.51 vs 0.98 ± 0.40 , $p < 0.05$) mRNA increased in MFAT compared to CON dogs, suggesting enhanced relative turnover of the central fat depot. In liver, rate-limiting gluconeogenic enzymes PEPCK and G6Pase mRNA increased by 160% and 180% respectively, consistent with enhanced gluconeogenesis ($p < 0.005$). Increased expressions of genes for central fat turnover and for gluconeogenesis suggest that increased flux of FFA from central fat depot to liver causes insulin resistance in healthy animals. Additional signals from central adipocytes to liver or peripheral tissues may also be involved in the development of insulin resistance, a major precursor for diabetes and other chronic diseases. Sincere thanks to my mentors Professor Richard N. Bergman and Postdoctoral Fellow (Molecular Biologist) Morvarid Kabir for a wonderful lab experience during the past few years.



Name: Ms. Cody Dashiell-Earp
Faculty Sponsor: Laura Baker
Category: Life Sciences
Submission: group
Format: Laboratory Research
Title: Bop-It Behavior: Genetic and Environmental Influences on Social Interactions among 9-year old Twins
Description: In order to understand individual social and antisocial behaviors, we developed a coded observational assessment of the twin sibling relationship using a 6-minute interactive game called “Bop-It.” Scales of positive and negative behaviors for each twin were formed based on global ratings and frequency counts. We examined correlations between

observational measures of sibling behaviors with other measures of aggression obtained in the study, such as the “Point Subtraction Task” and ratings made by each twin and their mother. By comparing these assessments, we explore how the behaviors between siblings may predict other social behaviors outside of the family environment. We will also compare the behavior of MZ and DZ twins in order to examine the genetic influences in social behavior. 1From Marlborough High School Honors Research Program, working under the supervision of Dr. Laura Baker, USC Psychology Department; supported in part by a grant from the National Institutes for Mental Health #MH58354.



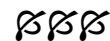
Name: Ms. Carolin Girgis
Faculty Sponsor: William McClure
Category: Life Sciences
Submission: Group
Format: Laboratory Research
Title: Immunohistochemical localization of neural antigens involved in schizophrenia
Description: Our laboratory has developed a rat model for the human disease of schizophrenia. Since no model can mimic perfectly any disease, it is important to learn how well this model matches some of the changes observed in the schizophrenic brain. We are developing the immunohistochemical techniques that will allow us to visualize two receptors and on protein that are involved in development of the nervous system and have been implicated in schizophrenia. Dopamine is a neurotransmitter that has several receptors, of which two are significant in schizophrenia. The general literature of

schizophrenia indicates that the disease probably alters both the D1 and D2 receptors. Reelin is a protein that is important in directing the lamination of the cortex in both the cerebrum and the cerebellum of mammals. One of the anatomical hallmarks of schizophrenia is an error in the structure of the cortex, which could be due to an error in the function of reelin. Reelin is reduced by about 50% in the cortex of brains from schizophrenic patients. The DA receptors and reelin appear to be excellent molecules with which to test the quality of our rat model. We have accordingly begun studies to visualize these three proteins in control tissue from rat brains. Each of the three can be visualized using techniques that we have optimized in our laboratory. With these procedures now in hand, we shall proceed to examine the amount and distribution of all three proteins within our schizophrenic model brains. Supported, in part, by the Provost's Fund for Research and the Undergraduate Research Grants from the College of Letters, Arts, and Sciences.



Name: Ms. Danielle Goeden
Faculty Sponsor: William McClure
Category: Life Sciences
Submission: Individual
Format: Laboratory Research
Title: Mild Prenatal Stress of Rats Increases the Thickness of the Cerebral Cortex in Specific Areas
Description: Sprague-Dawley rats were subjected to very mild restraint stress (once per day for 90 seconds) on days 11-14 of pregnancy. Pups born to treated mothers were raised to young adulthood (p109). After sacrifice, coronal sections of brain taken at the

level of the decussation of the anterior commissure were stained for Nissl substance and examined. The cortex of these animals was altered by prenatal stress. In the insular cortex prenatal stress caused an increase in thickness of 6.2% ($p < 0.001$). A significant increase in thickness (6.0%, $p = 0.003$) in prenatally stressed animals was also noted in the primary sensory cortex. The effect in the insular cortex was slightly more significant in the left than the right hemisphere. Females were affected much more strongly than males at most cortical locations. These data suggest that very mild prenatal stress can alter the development of specific parts of the limbic cortex. Prenatal stress may cause developmental errors associated with mental illness. Schizophrenics also display errors in the limbic cortex. It is possible that the changes observed in prenatally stressed rats are related to those seen in schizophrenia. Prenatally stressed rats may provide a useful model system for human schizophrenics.



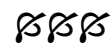
Name: Mr. Ryan Hamilton
Faculty Sponsor: John Petruska
Category: Life Sciences
Submission: Group
Format: Research Based
Title: Coding Constraints on Hexanucleotide vs. Trinucleotide Repeats in Yeast Genome
Description: In protein-coding DNA, trinucleotide repeats encode amino acid repeats in protein, while hexanucleotide repeats encode repeating pairs of amino acids. Such repeats in DNA have been shown to expand in vitro by strand slippage during DNA synthesis, but their expansion in vivo appears to be constrained by selection in relation to the

hydrophobicity of encoded amino acid sidechains. Selectivity quotients indicating such constraints were first obtained for amino acid repeats encoded by trinucleotide repeats in yeast genomic DNA (J. Petruska and M. Good, unpublished manuscript, 2001). The shortest repeats ($n = 2$) were attributed to random mutation, while repeats of length $n = 6$ or greater were attributed to expansion by DNA slippage. In the present study we have evaluated selectivity quotients for repeating pairs of amino acids, encoded by hexanucleotide repeats in yeast genomic DNA. As before, our evaluations were made using the Saccharomyces Genome Database and attached PatMatch program at the Stanford University Web site (<http://genome-www.stanford.edu>). Here we compare our observed results with predictions made using the selectivity quotients obtained by Petruska and Good for single amino repeats in the $n = 2$ case (random mutation) and in the $n = 6$ case (DNA slippage). We tested two simple methods of predicting selectivity quotients for amino acid pairs, one using an arithmetic mean and the other a geometric mean. In each case, predicted results were compared with observed results to determine the degree of correlation and to reveal significant deviations from expectation.



Name: Mr. Andrés Martínez
Faculty Sponsor: B. Richard Archer
Category: Life Sciences
Submission: Individual
Format: Research Based
Title: Nitrogen fixation vs. Denitrification from the Last Glacial Maximum

Description: Looking at N15 enrichments at the last glacial maximum and the holocene (20,000 years to the present, give or take) over the tropics and subtropics gives picture of the state nitrogen fixation and denitrification. This affects other cycles such as phosphorus, and carbon: leading to variations in the estimated biological productivity. This in turn may possibly account for an appreciable amount of pCO₂ drawdown into the global oceans.



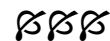
Name: Ms. Samantha Enass Mekhail
Faculty Sponsor: Sarah Bottjer
Category: Life Sciences
Submission: Individual
Format: Laboratory Research
Title: Inhibitory Communication Between Neurons in the Songbird Brain
Description: In an attempt to elucidate the differences in song learning between juvenile and adult male zebra finches, this project was designed to find the inherent properties of inhibitory chemical signaling in the songbird brain. The motivation to do this relies upon the fact that there is a sensitive period in which zebra finches hear, learn, and imitate specific vocal patterns. This sensitive period exists only during the juvenile age range beginning at 20 days old and ending at 65 days old. Juvenile zebra finches learn their song from a tutor, usually their fathers. Only males are capable of learning and generating song. Once these songbirds reach adulthood and have passed this sensitive period, song is frozen in memory, and they do not learn any new song patterns. Developmental changes in inhibitory signals that may correlate with specific aspects of song learning were studied. As there are a set of areas in the

songbird brain devoted to learning and producing song, one region was focused upon: the lateral magnocellular nucleus of the anterior neostriatum (l-MAN).

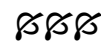


Name: Ms. Julie Miller
Faculty Sponsor: Carol Koprowski
Category: Life Sciences
Submission: Individual
Format: Research Based
Title: Quality of Dietary Intake in Adolescent Females with Disabilities
Description: The prevalence of overweight and obese children and adolescents has substantially risen in the last decade. Monitoring dietary patterns of children and adolescents is beneficial in solving this increasing phenomenon. The maintenance of a healthy lifestyle in adolescence, which includes a balanced diet, will help prevent the onset of future health complications such as cardiovascular diseases, diabetes mellitus, and some forms of cancer. Currently, the dietary intake of adolescent females with disabilities has not been studied. This study examined the dietary intakes of twelve adolescent females with disabilities. A twenty-four hour diet recall was taken, varying from one to three days. The subjects' responses were analyzed using the Healthy Eating Index (HEI) as a guide. The HEI measures how well one's diet recall compares to the Dietary Guidelines of the US Department of Agriculture and the Food Guide Pyramid. The HEI consists of ten components of a healthful diet, such as grains, fruit, total fat, and variety. The results for the data collected revealed that 0% of the subjects had a rating of "GOOD" or "POOR" and 100% fell into the "NEEDS IMPROVEMENT"

category. Less than 10% of the subjects in the study consumed the recommended servings of milk, fruits, and vegetables. These findings indicate that more effective programs need to be developed to enhance the nutrition of adolescent females with disabilities.



Name: Ms. Kimberly Shapiro
Faculty Sponsor: Ed Blum
Category: Life Sciences
Submission: Group
Format: Research Based
Title: Neuromotor Control of Rat Ankle Motion: Development of a Neural Model
Description: A method for empirically evaluating models of functional electrode stimulation (FES) in the lower limb has been developed. In this method, Sprague-Dawley rats are spinalized and implanted with chronic unipolar epimysial electrodes that allow functional electrode stimulation of muscles of the lower limb by an external stimulator. Several patterns of electrical stimulation are applied. The resulting motion of the ankle joint is recorded to videotape, and quantified using motion capture software. Motion predicted from a model is then quantitatively compared with this actual measured motion. This method allows quantitative evaluation of strengths and weaknesses of different models.



PHYSICAL SCIENCES, MATH & ENGINEERING

Name: Mr. Stan Avezov

Faculty Sponsor: Curt Wittig

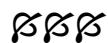
Category: Physical Sciences &
Engineering

Submission: Individual

Format: Laboratory Research

Title: Performing helium droplet mass-depletion spectroscopy measurements using an electret microphone

Description: In recent years, spectroscopic studies of atoms and molecules trapped inside helium droplets (i.e. clusters containing 10^3 to 10^6 helium atoms) attain considerable interest. In this work, a new method of such spectroscopic measurement is suggested. This method is an implementation of well-established mass depletion technique that is based on the phenomenon of evaporation of helium atoms from the surface of helium droplet when a particle trapped inside the droplet absorbs a quantum of radiation. It is suggested to use mechanical pressure transducer such as electret microphone to measure overall helium flow in helium droplet beam. The pressure transducer is sensitive to the change of momentum carried by the helium droplet beam. The sensitivity of this technique can effectively be increased with the use of more sensitive transducer.



Name: Mr. Matthew Behrend

Faculty Sponsor: Martin Gundersen

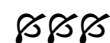
Category: Physical Sciences &
Engineering

Submission: Group

Format: Laboratory Research

Title: Micropulser for Real-Time
Microscopy of Cell Electroperturbation

Description: A miniature solid state pulse generator ($\sim 400V$) is designed for the electroperturbation of biological cells in solution. Design emphasis is placed on compactness and the control over pulse shape with the goal of targeting specific cell response in gene expression or rate of induced apoptosis. Typically, work in cell electroperturbation with nanosecond pulses is performed on a batch of cells in a cuvette with volume of less than 1mL. The desire to observe in real time morphological changes and electrical potential gradients necessitates a design appropriate for optical and electrical studies. We describe here a "micropulser" for producing pulses of several hundred volts to a narrow channel of cells on a microscope slide. The pulse generator is based on a single fast power MOSFET and forms variable width square pulses as short as 15ns. The pulse generator unit and slide holder are compact and designed for optical access and monitoring of cells by fluorescence microscope. Real-time observation of cells under nanosecond pulses is expected to reveal the distribution of imposed electric fields in the cytosol and organelle membranes. Additionally, fast detection of fluorescent markers for the apoptotic pathway will give insight into the mechanisms of electromagnetic action upon biological organisms.



Name: Mr. Jared Clarke
Faculty Sponsor: Maxim Olshanii
Category: Physical Sciences & Engineering

Submission: Individual

Format: Research Based

Title: A closed class of finite-amplitude excitations in quantum dots, dipolar condensates, and other system

Description: This paper investigates the behavior of a harmonically confined charged classical gas. The goal of this project is to quantify the dynamics of the finite-amplitude "breathing excitations" of the gas. It turns out that the "breathing excitations" constitute a closed, decoupled from the rest of the phase space class of excitations, that allows for a simple analytical treatment.

The focus of this project revolves around the two-dimensional case, thought to be a good model for plasma flows, ionic exhaust, and quantum dots.

Quite surprisingly our model permits a generalization to a broad class of interparticle interaction potentials, very different from the Coulomb interaction the project originated from. We use the generalized model to describe excitations of conventional, as well as dipolar trapped Bose condensates.

In course of our work we discovered that our simple classical hydrodynamical model is quite sensitive to hidden dynamical symmetries of the original quantum system. In particular the amplitude independence of the excitation frequency of a two-dimensional short range interacting Bose gas can be shown to be a signature for a hidden dynamical invariant, represented by the moment of inertia [4]. Another surprising result is the amplitude independence of the

breathing frequencies in the two- and three-dimensional Calogero models, hinting on the integrability (at least partial) of their quantum counterparts.

Results of our project can be used in design of ion optics devices and quantum dots, the latter being one of the most promising tools for quantum information processing. Also our model can be used to treat the free expansion dynamics of Bose condensates: due to the spatial resolution problems, the free expansion is currently the only way to monitor the spatial distribution of Bose-condensed atoms.



Name: Mr. Joshua Cripps
Faculty Sponsor: Andrew Ketsdever
Category: Physical Sciences & Engineering

Submission: Group

Format: Laboratory Research

Title: Propulsion for the Next Generation

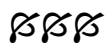
Description: The Propulsion for the Next Generation project is a collaborative effort between Joshua Cripps and John McArthur, both of whom are undergraduates in aerospace engineering. The project focuses on the analysis of a hollow cathode ion micro-thruster, as well as the performance testing of this thruster.

The hollow cathode ion micro-thruster is being studied because of its small size. Typical ion thrusters rely on a magnetic field to direct the ion stream. The apparatus involved in creating this field greatly increases the size and mass of the thruster system. The hollow cathode thruster however uses the configuration of its cathode and anode to direct the ion

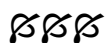
flow, which means that the thruster can be on the order of a few inches across. As such, its potential for use in micro-satellite systems is enormous.

In order to test the performance of the thruster, a micro-Newton thrust stand had to be developed. This stand is basically a symmetric box and arm setup that can rotate with extremely low friction about its vertical axis. When thrust is provided at the end of either arm, a deflection is induced in the stand. This deflection can be measured and from it we can subsequently compute the thrust that was provided.

The thrust stand and the ion micro-thruster have yet to be used together. However both are nearing the end of their developmental stages. When this happens and the two systems are integrated, the characteristics and potential of the thruster can be ascertained with great certainty.



Name: Ms. Kathryn Erickson
Faculty Sponsor: Bruce Koel
Category: Physical Sciences & Engineering
Submission: Individual
Format: Laboratory Research
Title: Molecular Beam Studies on Gold Surfaces
Description: Through the use of a molecular beam model designed by previous studies (by Bowker), the reactivity on gold surfaces will be studied. Gold surfaces were typically thought to be inert, but recent studies have shown otherwise. This project is a continuation of those studies.

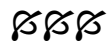


Name: Mr. Nicholas Ertmer
Faculty Sponsor: Henry Koffman
Category: Physical Sciences & Engineering
Submission: Individual
Format: Creative Work
Title: USC 2002 Concrete Canoe - Pandarus
Description: Every spring, civil engineering students nationwide come together to compete in the National Concrete Canoe Competition sponsored by the American Society of Civil Engineers (ASCE). USC has typically ranked at the bottom in the Pacific Conference every year; however, this year we have an amazing product to showcase. The canoe, named Pandarus for a legendary Trojan warrior, is made from lightweight concrete that floats. It is 21'-0" and 30" across. The maximum capacity of Pandarus is 950 lbs, which should safely carry the required 4 people during the multiple races at the conference. The hull of the Pandarus is a mere 1/2" thick allowing the entire canoe to weigh less than 120 lbs. This was a yearlong project that consisted of research, design, construction, and the presentation of the canoe.



Name: Ms. Brooke Ferguson
Faculty Sponsor: Larry Dalton
Category: Physical Sciences & Engineering
Submission: Individual
Format: Laboratory Research
Title: Active Transport on the Nanoscale Using Motor Proteins
Description: My summer research project deals with the construction of nanoscale devices. Developing nanoscale devices is an important concept to study because it allows for

the creation of materials from nanoscale building blocks which operate at the single molecule level allowing for savings in mass, energy consumption and increase in functionality. The nanoscale building block that I will be working with is conventional kinesin from the brain. Kinesin is a type of motor protein enzyme that serves to convert chemical energy, driven from the hydrolysis of ATP, into mechanical work therefore used to drive cell motility. Cell motility is studied in a gliding assay which is created in a flow cell by four simple steps: 1) adsorbing a protein monolayer onto a surface by flushing in a solution containing casein to reduce denaturation, 2) adsorbing the molecular motors to the pretreated surface by exchanging the solutions, 3) adding the microtubules from a third solution (sheering of the microtubules may be necessary to reduce the size), 4) imaging motility with optical microscopy. Surfaces that are sparsely coated with purified kinesin allow for the gliding of molecular shuttles, specifically microtubules, across a surface. Kinesin is a useful motor protein because it is processive due to its two-headed molecule structure. The tail of the kinesin protein is attached to the surface in a gliding assay and the heads of the motors move the microtubule. This type of protein machine directs movement along the cytoskeletal filaments by notably walking the molecular shuttle along its path.



Name: Mr. D. Cornelius Hojatkashani
Faculty Sponsor: Edward J. Rhodes, Jr.
Category: Physical Sciences & Engineering
Submission: Group

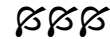
Format: Research Based
Title: Temporal Shifts in the Frequencies of Solar P-Mode Oscillations

Description: Helioseismology is the study of the internal structure and dynamics of the solar interior through the analysis of the motion of trapped acoustic waves at varying depths within the solar interior. These trapped standing waves range in varying frequency, ν , and spherical degree, l , that are not uncorrelated. Previous studies have shown a direct correlation between changes in the frequencies 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. This project will present measurements of these frequency changes over a series of short-duration time-series that have been selected to maximize the sensitivity of the p-mode frequencies to changes in the levels of solar activity. We also intend to show that, as the time-series are lengthened, the sensitivity of the frequencies to solar activity is diminished. We anticipate that the frequencies of the harmonic modes can be measured accurately and reliably from runs which are as short as six days in duration, or about one-quarter of one solar rotation. The frequencies we will be studying will be computed from Dopplergrams taken with the 60' Solar Tower Telescope at the Mt. Wilson Observatory during Solar Cycle 23, and our computations will utilize software developed by the helioseismology group in USC's Department of Physics and Astronomy.



Name: Mr. Adam Johnson
Faculty Sponsor: John O'Brien
Category: Physical Sciences & Engineering
Submission: Individual
Format: Research Based
Title: Building Better Nanolasers: Developing An Automated Alignment System for Electron Beam Lithography
Description: The MicroPhotonic Devices Group at USC is working on the design and fabrication of nanolasers whose primary application would be to create faster optical communications systems for high-speed transfer of information. These nanolasers have dimensions of less than a tenth of the width of a human hair, and are thus created using precise fabrication techniques. I have been working on a way to improve one of the steps in this process, namely the electron beam lithography process using a scanning electron microscope. Lithography is a process by which the laser structures that form the nanolaser are created in relief on a substrate through the interaction of beams of photons or particles with materials. With electron beam lithography, the relief image is created by directing the beam of electrons emitted by a scanning electron microscope onto a resist, a material that changes composition where it is hit by the electron beam. By controlling the electron beam with an outside computer program, a very finely designed laser structure can be patterned on top of the substrate, but if this structure is not accurately centered, the nanolaser will not function correctly. Currently, the laser structure is centered using the human eye to estimate the center of a small square region whose area is about

0.4 square nanometers. The inherent error of human estimation calls for a more accurate system to be produced. Using image-processing techniques, I am exploring ways to automate this process of electron beam lithography.

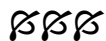


Name: Mr. Yit Phang Khoo
Faculty Sponsor: Gaurav Sukhatme
Category: Physical Sciences & Engineering
Submission: Individual
Format: Research Based
Title: Robomote
Description: Robomotes are small (less than 2.5"x2.0"x1.0"), inexpensive (less than \$150 each) mobile robots. The primary motivation for these robots is to enable research into areas such as large-scale network robotics or reconfigurable sensor networks that are previously either considered too costly or require too much space. Each Robomote features a wireless network interface, two speed and direction-controllable wheels with optical encoders for odometry; a solar panel for "always on" functionality; a compass for direction; bump sensors and infra-red sensors for obstacle avoidance; as well as an expansion interface for additional sensors and processing units.



Name: Mr. David Lazzara
Faculty Sponsor: Fred Browand
Category: Physical Sciences & Engineering
Submission: Individual
Format: Research Based
Title: Instantaneous Pressure Measurements of Turbulent Flow in the Gap of a Tractor-Trailer Vehicle

Description: Tractor-trailer vehicles are essential to the success of commerce throughout the world. Transportation costs associated with these vehicles are reflected in the price of consumer products and in energy costs for countries as well. Therefore, reducing the required energy to operate tractor-trailers would benefit most consumers. The USC Ground Vehicle Aerodynamics Lab has approached this concept by attempting to significantly reduce tractor-trailer drag. Their work includes wind tunnel force measurements of tractor-trailer models and Digital Particle Image Velocimetry flow visualization experiments. Funding from the Department of Energy and collaboration with other universities and government laboratories, including Caltech and Lawrence Livermore Labs, enables the USC Ground Vehicle Aerodynamics Lab to contribute effective drag reducing methods that are further supported by computational fluid dynamics simulations (CFD) and large scale wind tunnel tests. The consortium needs further insight, though, before completely understanding the flow behavior between the tractor and trailer and its direct association with the total vehicle drag. This project establishes a method of measuring instantaneous pressure in the gap region and correlates the results with the vehicle drag and side-force. Its specific scope will provide useful information for reducing the influence on drag due to the gap flow.



Name: Mr. Umberto Malesci
Faculty Sponsor: Gerard Medioni
Category: Physical Sciences & Engineering

Submission: Individual

Format: Research Based

Title: A Handheld Virtual Mirror

Description: We present the design and construction of a handheld virtual mirror device. The perception of the world reflected through a mirror depends on the viewer's position with respect to the mirror and the 3-D geometry of the world. In order to simulate a real mirror on a computer screen, images of the observed world, consistent with the viewer's position, must be synthesized and displayed in real-time. Our system consists of a flat LCD screen manipulated by the user, a single camera fixed on the screen, and a tracking device. The continuous input video stream and tracker data is used to synthesize, in real-time, a continuous video stream displayed on the LCD screen. We have shown that, assuming planar geometry for the world, the transform relating the user view to the camera view is reduced to a scaling and a translation. This model provides a straightforward and efficient way of synthesizing the viewer's image stream from the camera stream, and the synthesized video stream is a close approximation of what the user would see on the screen surface if it were a real mirror. The design and construction of realistic virtual mirrors represents an original experiment in Human-Computer Interface that opens the door to various interactive experiments in entertainment, arts and communication. Use of video analysis and graphics techniques will allow to explore and to interfere with what has always been a private, solitary act of a person looking in a mirror.



Name: Mr. Kalani Matsumura
Faculty Sponsor: Massoud Pirbazari
Category: Physical Sciences & Engineering

Submission: Individual

Format: Laboratory Research

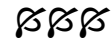
Title: Phytoremediation

Description: This project was a direct investigation on the phytoremediative capabilities of plants. In particular, this project investigated the absorption of lead from soil, also considering the effects of "acid rain." Two types of plants were used with a control, lead exposure, "acid rain" exposure, and lead and "acid rain" exposure. To simulate acid rain, sulfuric acid, H₂SO₄, of an approximate pH of 3.5-3.7 was used. Plants that were exposed to lead initially were replanted in soil that had been mixed with a lead solution, and contained roughly 5 grams lead per kilogram of soil. The plants were maintained for 6 weeks. At the end of that time the lead concentration in the plants was determined by inductively coupled plasma, ICP, via the Plasma 40 machine in Biegler Hall. One type of plant turned out to be extremely effective at uptaking lead.



Name: Mr. Hieu Nguyen
Faculty Sponsor: Ralph Kaufmann
Category: Physical Sciences & Engineering
Submission: Individual
Format: Research Based
Title: Why
Description: Given a bounded, simply connected, and connected region, I am interested in finding a vector J, if any, such that all lines that are drawn parallel to J from a point on the region's

boundary will intersect the boundary at exactly 2 points.



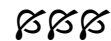
Name: Mr. Christopher Romero
Faculty Sponsor: Massoud Pirbazari
Category: Physical Sciences & Engineering

Submission: Group

Format: Research Based

Title: Denitrification of Reverse Osmosis Brine

Description: We will discuss the advantages of using a fluidized bed bioreactor with granular activated carbon to encourage the denitrification of reverse osmosis brine for the purpose of using the reclaimed water for non-potable uses.



Name: Ms. Allison Speer
Faculty Sponsor: Daniela Golinelli
Category: Physical Sciences & Engineering

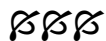
Submission: Individual

Format: Research Based

Title: Bayesian Analysis of Microarray Data for Identification of Replication Origins in *S. Cerevisiae*

Description: The goal of this project is to provide an accurate analysis of the microarray data in Wyrick et al. (2001). The aim of their research was locating the replication origins in the entire genome of *S. Cerevisiae*. They demonstrated that certain proteins (ORC and MCM) are associated with replication origins, and their binding sites are thought to be in close proximity to the actual origins. In their experiment, every spot on the microarray is either intergenic material or an open reading frame. The two samples hybridized on the array consist of

enriched DNA (with protein) labeled with red dye and of total genomic DNA labeled with green dye. Ideally, the spots would reveal a list of 0's and 1's indicating the presence or absence of binding sites. Instead, we observe the relative intensity of the two dyes, expecting the red dye to be brighter than the green at binding sites. The analysis is challenging because the data are high dimensional (7000 spots/array) and noisy. We developed a mixture model that accounts for between array variability and noise in the observed signal. The model assumes that each spot's intensity either comes from a distribution describing the signal behavior of the binding sites or comes from another distribution describing the signal behavior of the non-binding sites. For each spot, we compute the probability that it represents a binding site given the observed data using modern statistical algorithms. The analysis is conducted using the computer software Imagen and Winbugs.



Name: Ms. Michelle Sutherland
Faculty Sponsor: Scott Paterson
Category: Physical Sciences & Engineering
Submission: Individual
Format: Research Based
Title: Santa Ana Mountain Region, California: Contact Analysis Between Santiago Peak Volcanics and Bedford Canyon Formation
Description: The Peninsular Ranges Batholith extends down from California through to Mexico. In the development of the batholith, two separate arc segments were brought together along the North American craton margin, with the Santiago Peak arc to the north of the Agua Blanca Fault, and the Alisitos arc

to the south (Gastil, 1993). The fault itself is thought to be a Cretaceous suture between the two arcs of which, both are of ocean-affinity. The Santiago Peak arc formed along the continental margin, and the Alisitos formed as a fringing or exotic arc that subsequently collided with the continental margin. The Alisitos arc and bordering areas have been studied closely, as to the geologic time of collision and arc formation (Wetmore, Thesis), yet little work has been done on the Santiago Peak.

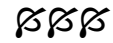
The eastern boundary of the Santiago Peak arc, within the Santa Ana Mountain region, is a contact that lies between arc and continental margin. The continental margin consists of pre-arc Jurassic-Cretaceous sedimentary basin of the Bedford Canyon Formation, overlain by younger Cretaceous Santiago Peak volcanics. This contact has been interpreted as a thrust fault or a depositional unconformity. In the Silverado Canyon, of the Santa Ana Mountain Region, the contact between the Santiago Peak volcanics and Bedford Canyon Formation is exposed. Through field mapping of the contact and the use of Rf/phi strain analysis on samples of the contact, it is plausible to better understand the type of contact between the formations.



Name: Mr. John Zhu
Faculty Sponsor: Richard Arratia
Category: Physical Sciences & Engineering
Submission: Individual
Format: Research Based
Title: Elementary Geometric Recursive Structures

Description: This is a presentation of original research into elementary fractals. The recursive structure involves the mutual inscribing of circles and regular n-gons. The paper begins with a definition of "area" for this class of fractals, and then analyzes the properties of the variance of area as a function

spanning the regular n-gons. The final result is to extrapolate from the analysis of the aforementioned function the fractal area of a circle/regular n-gon recursive structure.

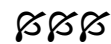


SOCIAL SCIENCES

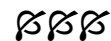
I & II

Name: Mr. Kian Barabi
Faculty Sponsor: Bosco Tjan
Category: Social Sciences
Submission: Group
Format: Research Based
Title: Spatial Memory Distortions across Boundaries
Description: Purpose: Spatial memory has been found to have a hierarchical organization, with objects encoded relative to their immediate regions delineated by boundaries. Further, it has been reported that objects in space are judged by adults to be farther away from boundaries. Methods: 19 children (avg. age 10.4) and 14 adults (avg. age 37.2) viewed and recalled the location of objects that were placed across a boundary. In Exp. 1, subjects viewed and memorized a 2-dimensional map containing three objects, a landmark, and a border. Subjects later recalled the position of a target object relative to the landmark and one other object on an answer sheet without the border. Angular error of the recalled position was measured. Exp. 2 replaced the maps of Exp. 1 with a 3-dimensional real life setting of objects on a lawn. Subjects recalled the direction of one object relative to a general direction indicated on an answer sheet. Results: Objects that were close to the border were judged to be further away from it, but objects that were further away from the border were judged to be closer to it. The magnitude of this systematic error was about 20 degrees for both children and adults and in both experiments. Conclusion: Although stimuli are different, results are remarkably consistent across

experiments (map vs. 3-D) and across children and adults. Depending on an object's distance from a boundary, the object is either remembered to be further away from the boundary (if the distance is small) or closer to the boundary (if the distance is large).

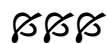


Name: Mr. Daniel Barnes
Faculty Sponsor: Steve Ross
Category: Social Sciences
Submission: Individual
Format: Research Based
Title: A Modest Proposal
Description: This proposal does not argue whether or not the People of the United States should abolish the current government (or a reformist system in general). Instead, I examine the concept of a transformist system - including requirements and principles - and proffer three transformations whose result is a radically different foundation and organization of power within the United States, one that may be more likely "to effect...Safety and Happiness."



Name: Ms. Jennifer Carlisle
Faculty Sponsor: John Odell
Category: Social Sciences
Submission: Individual
Format: Senior Honors Project
Title: Proposal for a National Biometric Identification Database
Description: This thesis proposes a radical idea to correct fundamental security flaws in the identity verification

systems used in the U.S. and internationally. This proposal advocates development of a Biometric Identification System (hereafter referred to as BIS) to remedy current shortcomings. In my research over the past year, I found no plans or proposals adequate to meet our current identity verification needs. Today there is no system that verifies, with a high degree of certainty, the identity of individuals who cross our borders, board our airplanes or who work in our government, medical and financial professions. Furthermore, there is no practical means of authenticating the paper identifications that we rely upon in the U.S. Counterfeit documents are relatively easy to obtain -- for both citizens and non-citizens. Following the September 11th (9/11) terrorist attacks, there is a heightened awareness of the need to improve our identification capabilities. Interpol has called for an enhanced international police and judicial collaboration to tackle terrorism and organized crime more effectively, for example by exploring all opportunities to coordinate legal, judicial and operational approaches. Our current identification systems are incapable of adequately meeting these needs. This is particularly significant for the large number of non-citizens who visit and work in the U.S. This thesis describes an alternative identification system, which provides a superior solution to the problem.



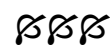
Name: Ms. Allison Chan
Faculty Sponsor: Linwood Pendleton
Category: Social Sciences
Submission: Individual

Format: Research Using Secondary Materials

Title: Environmental Values and Agricultural Biodiversity

Description: Sustainability in agricultural ecosystems has historically depended upon maintaining genetic diversity among crop varieties. According to David Cleveland, “environmentally, economically, and socially sustainable agriculture can be broadly defined as agriculture that provides adequate food and income equitably for present generations while conserving natural resources for future generations.” Traditionally, farmers cultivated several varieties of a single crop in order to protect against plague and other threats to a successful harvest. This valuable biodiversity, however, has been threatened by the industrialization of agriculture. People around the world currently consume approximately 7,000 species of plants, but only 150 of those are commercially important. Of those 150, about 103 species account for 90% of the world’s food crops. We are therefore making use of less than 2% of our plant genetic resources in our food markets.

Beginning with the Green Revolution of the 1960s, the commercialization of agriculture involved a variety of actors, including small and corporate farmers, transnational corporations, consumers, geneticists, and governments – all of which have adopted their own sets of values and priorities. Clashes between these actors and their values have caused agricultural biodiversity to become a global economic, political and environmental conflict.

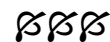


Name: Ms. Suong Che
Faculty Sponsor: JoAnn Farver
Category: Social Sciences
Submission: Individual
Format: Research Based
Title: Ethnic Identity and Psychology Well-Being of Biracial Adolescents
Description: The purpose of this study is to examine how ethnic identity and acculturation in biracial adolescents contribute to adolescent psychological functioning as measured by self-esteem and anxiety. Biracial individuals are an ever-growing population in America. Since the mid-20th Century, the general opinion on interracial dating and marriage has become more liberal and the birth of biracial children has increased tremendously (Overmeier, 1990). Currently, very little information is known about biracial individuals and their psychological well-being. As this unique population grows in America, more research needs to be focused on them. This paper aims to add to the body of knowledge on biracial adolescents and to increase the awareness about the various issues that they face, particularly as adolescents. Ninety adolescents of Biracial, Asian, and Caucasian ethnicity will be recruited to participate in this study. They will complete surveys that measure ethnic identity, acculturation, self-esteem, depression, and anxiety.



Name: Ms. Margaret Clark
Faculty Sponsor: Pierrette Hondagneu-Sotelo
Category: Social Sciences
Submission: Group
Format: Field Research

Title: Activist Responses to Post-September 11, Muslims, Arab-Americans, and Immigrants
Description: This paper begins to map out the ways in which immigrants in the United States have been affected by the post-September political, legislative, social/civil, and economic consequences. Our method includes in-depth interviews with key leaders involved in protecting the civil rights of these groups, and in advocating on their behalf. The final paper will present not only the mapping of how immigrants have been affected by the post-September 11 backlash, but interview data and analysis of what advocates in diverse Southern California organizations--such as the Muslim Public Affairs Council, the Coalition for Humane Immigrant Rights, National Lawyers Guild, the ACLU, and the Asian Pacific American Legal Center--are doing in response to these mostly negative consequences. The paper will also include an analysis of the explanations and meanings that these actors attribute to their actions.



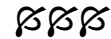
Name: Ms. Elizabeth Crall
Faculty Sponsor: JoAnn Farver
Category: Social Sciences
Submission: Individual
Format: Senior Honors Project
Title: Violence Exposure, Depression, and Drug Use in High-Risk Latino Youth
Description: This study examined the use of stimulants to self-medicate depressive symptoms among Latino youth exposed to chronic violence. Previous research has shown that people exposed to chronic violence often develop depressive symptoms, and also that depressed people often use

stimulants to relieve emotional distress. However, the use of stimulants to self-medicate has not been examined among adolescents. Therefore, this study examined the hypothesis that adolescents who suffer from depressive symptoms engage in stimulant use as a means of reducing their emotional distress. 200-250 high-risk Latino students were recruited for the study from Los Angeles area high schools and alternative schools. Measures included the Center for Epidemiological Studies - Depression (CES-D) scale, the Michigan Alcohol and Other Drugs School Survey (MAOD Survey), the Personal Experience Inventory (PEI), and the Violence Exposure Scale (VES).



Name: Ms. Carina Cuellar
Faculty Sponsor: Richard A. Easterlin
Category: Social Sciences
Submission: Individual
Format: Senior Honors Project
Title: Private Materialism
Description: Are American youth as materialistic as the media would lead us to believe? Are certain subgroups more materialistic than their counterparts? What has been the trend in material aspirations? From the late eighties to the late nineties, private materialism as a life goal among American high school seniors as a whole was remarkably constant. There were, however, differences among subgroups of seniors in both levels and trends. Blacks have higher material aspirations than whites, and males than females. Those expecting to attend college had similar aspirations as those not expecting to attend college both at the beginning and end of the period. The gap in aspirations between blacks and whites narrowed

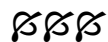
significantly during the period under examination. Also, the historic gap between males and females continued to narrow.



Name: Mr. Dan Cutting
Faculty Sponsor: Toby Mintz
Category: Social Sciences
Submission: Individual
Format: Senior Honors Project
Title: Exploring an Innate Cognitive Mechanism of Music and Language
Description: Recent research has shown that music and language are structured similarly (Lerdahl and Jackendoff, 1983) and are processed analogously in experienced musicians (Falk, 2000). Logically, then, it would follow that these domains employ similar learning mechanisms. Preceding studies showed that subjects can segment unknown word forms from a continuous, unsegmented stream of syllables in an artificial language by attending to syllable co-occurrence patterns (Saffran, Aslin, and Newport, 1996). Parallel results were found for similarly structured musical tone sequences (Saffran, Johnson, Aslin, and Newport, 1999). Using the other dimension of music and rhythm, sixty college students will be tested on their ability to learn the "rhythm words" of an artificial language of drum beats. Assessment of learning will be made using a forced-two-choice test. Results similar to the preceding studies are predicted, despite changing the artificial language corpus to consist of rhythm stimuli. With approximately fifty participants tested, all performed above chance, suggesting a hypothetical cognitive mechanism of language is also used in music perception.

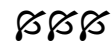


Name: Ms. Nooreen Dabbish
Faculty Sponsor: Lynn Swartz
Category: Social Sciences
Submission: Individual
Format: Research Using Secondary Materials
Title: Notions of Value in the Ancient World: Development and Iconography of the Reverse Sides of Coins.
Description: This project examines the origins of abstract notions of value. Beginning with a historical analysis of the invention of coins, the project analyzes pre-coin objects of value with the hypothesis that these objects laid the foundation for abstraction to a monetary system. Traditionally, scholars define pre-coins to include such items as precious metals, beads, Cowrie shells, feathers, animals, tobacco, ivory, and salt. Also explored is evidence indicating that ancient Egyptians used tokens shaped as bread loaves as pre-coin currency. With the advent of coins in ancient Lydia, the focus of the project shifts to an examination of the iconography of coins, particularly their reverse sides. The hypothesis examined is that the use of standard symbols rather than unique artistic designs accelerated the acceptance of coins as objects of value.



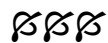
Name: Ms. Debbie Dao
Faculty Sponsor: Zhong-Lin Lu
Category: Social Sciences
Submission: Individual
Format: Senior Honors Project
Title: Perceptual Learning of Gabor Detection
Description: Perceptual learning is observed when performance in a perceptual task improves with practice. Studying perceptual learning lends

insight to the plasticity of adult perceptual systems and provides information about how the human perceptual system works. The present study examines perceptual learning of Gabor detection using an external noise paradigm (Doshier & Lu, VR, 1999) to infer the mechanism(s) underlying such learning. In addition, it measures orientation sensitivity functions before and after training in one particular orientation (45 deg) to measure the bandwidth of the learning effect in both low and high external noise conditions. The study will reveal the properties of the processes that underlie perceptual learning.



Name: Ms. Katherine FitzSimons
Faculty Sponsor: Joan Weibel-Orlando
Category: Social Sciences
Submission: Individual
Format: Field Research
Title: El arbol de Guernica: A Spanish Basque Symbol
Description: The Northern Spanish Basque town of Guernica has often been called the "Crucible of World War II". Guernica provided Hitler's German Air Force with pre-war practice and training, which helped its members perfect the blitzkrieg technique used to destroy other European cities later in the war. On April 26, 1937, Spain's General Franco asked the German Air Force to bomb Guernica--cultural capital and site of the Basques' historic Parliament. Over 2,000 innocent civilians were slaughtered, but the town's symbol of Basque pride and independence did not fall. The Tree of Guernica, a 300-year-old oak which stands outside of the Parliament building there, survived as a testament to Basque independence.

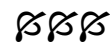
Picasso in his famous painting, Guernica, later immortalized the town itself. The Basques speak their own language called Euskara, which has non-Latin roots and is totally unrelated to the Spanish language. Anthropologists claim Basques descend from one of the oldest tribes of Europe. Since Franco's time, Basques have also established their own terrorist/separatist group called ETA. My project explores the Basques' rich cultural history, and their struggle for ethnic identity and independence, as symbolized by the Tree of Guernica.



Name: Ms. Monica Ghailian
Faculty Sponsor: Prof. M. Earleywhine
Category: Social Sciences
Submission: Individual
Format: Research Based
Title: Post Traumatic Stress Disorder
Description: This exploratory study will examine the relationship between drug use and Post Traumatic Stress Disorder (PTSD) among Latino adolescents. The purpose is to better understand the prevalence of PTSD in violence exposed and substance abusing adolescents. Extensive literature has suggested a strong relationship between substance use and PTSD. However, little is known about the causal pathways that might explain this observed comorbidity. In addition, the co-occurrence of symptoms has not been directly examined among high-risk Latino adolescents

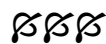
Researchers suspect that drug use self-medicates severe emotional distress. While drug use has been traditionally considered as a means for self-medication, little is known about drug use as a risk factor for PTSD. Some researchers believe that drug use may

increase the risk of exposure to traumatic events, which in turn may leave individuals vulnerable to symptoms of PTSD. In addition, drug use may be associated with both skills deficits and the failure to use alternate coping responses. Insufficient coping strategies may aid in regulating or avoiding emotions associated with stressor exposure, however they do not include efforts in eliminating the impact of the stressor. Therefore, it is important to understand the functional relationships between PTSD and drug use.



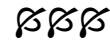
Name: Mr. Ryan Gillespie
Faculty Sponsor: Dr. Ken Sereno
Category: Social Sciences
Submission: Group
Format: Research Based
Title: Communication Effects of September 11, 2001.
Description: This is an in-progress research practicum, conducted under the advisement of Dr. Ken Sereno, designed to examine the communication effects of the September 11th, 2001 events. Our goal is to discover the change in effects of individuals' attitudes, opinions, and feelings prior to, during, and after this landmark date. The research focuses on individuals' responses to general, interpersonal, technological/media, and military actions from a communication perspective. We conducted a focus group to culminate effective questions that accurately convey the feelings and sentiments associated with September 11th. From there we formulated a thorough survey broken down into three major sections. The first section contains questions of general feelings prior to September 11th, while the second section covers reactions six

months after the events. The third section is an inquiry of immediate reactions. A viewing of two brief video clips of the plane crashes and New York's subsequent response prefaces it, which is in an effort to remind survey-participants of their initial feelings. Currently, we are in the survey-administration process. We will then formulate a statistical analysis in attempt to find a shift in communication behavior following the tragic event.

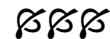


Name: Ms. Lauralee Gooch
Faculty Sponsor: Ann Crigler
Category: Social Sciences
Submission: Individual
Format: Senior Honors Project
Title: Patria: A Creative Examination of the Varieties of Patriotic Emotion
Description: Patriotism is a complex grouping of emotions that inspires terrible and wonderful behavior. The range of actions that are provoked by patriotism has led many scholars to conclude that it should be separated into two types, nationalistic and constructive, for purposes of study and discourse. In this project, I examine the emotions associated with these types of patriotism, focusing on concepts such as national attachment and personal attachment, as well as national identity and personal identity. I also examine how different moral ideologies may help to shape these different types of patriotism. Using the knowledge I have gained through this exploration of patriotic emotion, I have written a work of fiction entitled "Patria," which further examines these concepts through the actions and attitudes of its characters, and provides the reader with an experience that may

help him or her to delve into his or her own patriotic emotions.



Name: Mr. Jonathan Gordon
Faculty Sponsor: Ken Sereno
Category: Social Sciences
Submission: Group
Format: Research Based
Title: Humor and power in interpersonal relationships
Description: Our study measures the roles power and humor play in interpersonal relationships as they relate to relational satisfaction.



Name: Ms. Aubri Hathaway
Faculty Sponsor: Dr. Sternheimer
Category: Social Sciences
Submission: Individual
Format: Research Based
Title: Artistic Reflections of Socially Constructed Images of Women
Description: In an effort to re-define women's roles in society, researchers have taken a magnified glass to the distinct gender characteristics created for women in the past century. The focus has been on how these gender characteristics were created as well as how and what social constructs reinforced these ideas, such as media and the distinction of job disciplines. Additional focus is on how labeled deviant behaviors are used to police gender norms and create social control. However, because reactions to socially constructed behaviors are dependent on social situations and social issues of the time, the same controls delineating deviant female characteristics from non-deviant, have allowed the female identity to evolve and break the box once seemingly concrete. As a result,

women's roles, along with the deviant behaviors used to compare such roles are no longer clearly defined. Specific pieces of art by Norman Rockwell, an unknown poster artist, and Janine Antoni, clearly reflect the transitional role women have played in the past one hundred years. These pieces of art reflect the images society has constructed for women to play, and speak to the viewer about the characteristics that fit inside the box for female norms. Through viewing what was an idealized norm, one can also gain insight into what was deviant. By incorporating a social understanding of art history, along with sociological deviant theory to the history of female gender identification, one can more clearly understand how and why women's images and roles have changed over the past century.



Name: Ms. Jennifer Huffman
Faculty Sponsor: Maryalice Jordan-Marsh, Michael Cody, Merril Silverstein
Category: Social Sciences
Submission: Individual
Format: Research Based
Title: Gender Disparities
Description: New insights into the health status of the public have implications for nursing practice. First, self perceived health status can be superior to clinical indicators in predicting morbidity and mortality, although results varied by gender (Idler, Russell & Davis, 2000). Second, social capital (in the form of relationships, norms, and structures) within communities is a powerful predictor of the health of residents (Smedley & Syme, 2000). Assessment of health perceptions and available social capital represented by ways that men and

women access and share information may explain gender disparities. This report is from a larger study of health communication issues in families. Korean, Chinese, and Latino elders were recruited from communities in Los Angeles. Of the 132 participants, 54% were women (n=71). The majority of participants were 60-79 years old. Quality of life was assessed using the SF-36 Health Survey (Gandek & Ware, 1998; Ware & Sherbourne, 1992) in translation. Across ethnic groups, physical health scores, (PCS) for women were lower than scores for men ($p < .01$; Kruskal-Wallis two sided value). Mental health scores, (MCS) for women were lower than those of the men with Chinese and Korean differences significant at $p < .05$ (Wilcoxon 2 sample test). Preliminary analysis based on frequencies indicates discrepant gender-based health communication patterns. When asked who one would seek out for a difficult health decision, 52% of men would go to their wife. For women, only 25% named their husband, 30% named their physician. Findings support a shift in the nursing paradigm from care of individuals to a socio-ecological view of health.



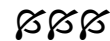
Name: Mr. David Keenan
Faculty Sponsor: Carole Shammas
Category: Social Sciences
Submission: Group
Format: Research Based
Title: Maryland Housing Stock Circa 1800
Description: A quantitative analysis and comparison of the housing stock of three Maryland counties: Somerset, Baltimore, and St. Mary's. Using information gathered from the Federal Direct Tax on

property in 1798, we will attempt to evaluate characteristics and trends of early American housing with careful attention to the cultural, economic, and political differences that existed among these regions.



Name: Ms. Sonia Khurana
Faculty Sponsor: Shrikanth Narayanan, Elaine S. Andersen, Dani Byrd
Category: Social Sciences
Submission: Group
Format: Research Based
Title: Development of Computer Agent Tool for Investigating a Spoken Language Interface for Young Children
Description: ChiMP--the "Children's Interactive Multimedia Project"--focuses on investigating the nature of child-machine communication targeting preschool age children; importantly these children are non-readers and non-typists. By examining child-machine interactions that take place using spoken language, we can develop enhanced multimedia technologies for children that will make their experience with educational computer tools more enjoyable and successful. Most conversational computer interfaces fail to account for preschoolers' limited understanding of linguistic complexities and consequently, are unable to communicate naturally with them to foster a positive learning experience. But, in ChiMP, with the use of a conversational interface called an agent tool and a "Wizard of Oz" testing setup that allows for control by a hidden human experimenter, we can analyze data collected from children interacting with machines using natural modes of speech and gesture. In a dual-monitor setup, we place one monitor displaying

the agent tool in the room in which the child will interact with the agent. This room is adjoined to a laboratory with a main computer that controls both monitors. With a camera taping the child, we can monitor child-machine interaction and manipulate the conversational agent accordingly. Developing interactive machines that are based upon natural human communication can significantly improve the relationship between the information system and the user. Preschoolers, in the process of acquiring and refining language, can use such advanced multimedia technologies to develop foundational school readiness skills and further integrate technology into daily life.

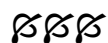


Name: Ms. Janet Kim
Faculty Sponsor: William McClure
Category: Social Sciences
Submission: Individual
Format: Research Using Secondary Materials
Title: Art as the Embodiment of Creative Illness
Description: Over the course of art history, the idea of an artist as a temperamental, volatile creator 'graced' by accompanying mental illness has developed. This image has been propagated by popular depictions of erratic or emotionally dynamic artists, as recently in movies like Pollock and Artemisia, and perhaps is reinforced by artists themselves. I am investigating the idea of a creative "illness" that is endemic to artists, whether or not such relationship exists between creativity and mental illness. In this study, I trace the development of the two disciplines, psychology and visual arts, as they relate

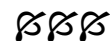
to each other and ultimately converge. As the initial model/ guide, I looked at the psychological/ psychoanalytical study conducted by Freud (Leonardo da Vinci and a Memory from his Childhood) in exploring the motivations, psychology, and history of Leonardo da Vinci. This study also reviews any research on the physiological basis of creativity, and the correlation between mental illness and creativity.



Name: Ms. Melissa Kriscunas
Faculty Sponsor: Sarnoff Mednick
Category: Social Sciences
Submission: Individual
Format: Research Using Secondary Materials
Title: Longitudinal association between adolescent heart rate and adult antisocial behaviors
Description: Research suggests lower resting heart rate among individuals with Antisocial Personality Disorder. Low resting heart rate may indicate a higher threshold for arousal and account for some behaviors common among individuals afflicted with APD. Baseline heart rates of subjects at age 15 were assessed. Then in adulthood, subjects were interviewed to assess psychological functioning. The present study will test the relationship between adolescent heart rate and adult antisocial behaviors. Subjects above and below the cut-off for antisocial behaviors will be compared. The hypothesis is that antisocial behaviors are associated with lower resting heart rate. Further, this study offers the advantage of prospectively assessed heart rate to predict antisocial traits in adulthood.

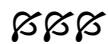


Name: Ms. Amanda Kwan
Faculty Sponsor: Dr. Richard Thompson
Category: Social Sciences
Submission: Individual
Format: Laboratory Research
Title: BDNF deficient mice exhibit decreases in contextual fear learning
Description: While extensive psychological experimentation has been done on emotions and learning and memory, very little biological evidence has been amassed. Psychological studies are important, but it would be more convincing to combine psychological findings with biological and biochemical evidence. This study attempts to achieve this as it is believed that brain-derived neurotrophic factor (BDNF) contributes to fear learning and memory. The conditioned fear to tone of BDNF +/- mutants is similar to wild-type animals. However, BDNF +/- mutants did exhibit significantly decreased contextual learning, thus supporting the hypothesis. It may be due to decreased BDNF expression and abnormal synaptic transmission in the brain.



Name: Mr. Omar Meza
Faculty Sponsor: Richard McIlvery
Category: Social Sciences
Submission: Individual
Format: Field Research
Title: The Challenges of Marketing and Promoting Latin Music in the U.S.
Description: Latin music is a growing market as more and more consumers realize the excitement of this music. Additionally, the census in 2000 shows an increase in Latin population. Even with a strong potential audience, the Latin music faces many challenges that hinder marketing and promotion plans.

The project will discuss the factors that make this an even greater challenge than with American music. This project will serve as an educational resource to record label executives. It will also educate those unfamiliar with Latin music about its growing influence and the challenges of maximizing its exposure. Research and conclusions are derived mainly from field interviews of music executives in artist management, concert promotion, music publicity and radio station management.



Name: Ms. Cecilia Mo
Faculty Sponsor: Hayward Alker
Category: Social Sciences
Submission: Individual
Format: Research Based
Title: Dramaturgical Analysis of Asymmetric Prisoner's Dilemma
Description: Political science has committed itself to the experimental investigation of Prisoner's Dilemma, and Iterated or Sequential Prisoner's Dilemmas (SPD's), with the hope that it would act as a breeding ground for which useful information pertaining to international conflict resolution could be obtained. However, up until now, scholars have used an experimental game procedure that treats the players of the games as programmed robots, in which the outcomes are tautologically predictable, cannot be hailed as a design that embraces the "human" aspect. The players of the game need to be perceived as "rational" in a sense that is different from the one advanced in conventional game theory. One may begin to transcend this treatment of human beings as automatons by treating SPD's as games where two players interact. This interaction, according to Paul Hare, can

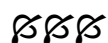
be observed through a dramaturgical lens: "The basic assumption for the analysis of social interaction as drama is that meaningful interaction takes place between individuals when they enact roles in support of some idea." SPD players are acting in a play of sorts in that their interactions can be described as a representation, by actors, on a stage, before an audience, of a struggle between individual human wills . . . and expressed in terms of objective action. Interested in peace research, I have observed that wills have purposes and peaceful conflict resolution occurs when the dramatic struggle of wills is resolved integratively, not destructively. When SPD games are understood as moral-political dramas, a research project in which the representational formalisms of text linguistics and cognitive science are utilized is an intriguing possibility. This current research study is an interdisciplinary one in that it attempts to use linguistic and cognitive science based tools to understand how a "dramatic struggle of wills" is resolved peacefully.



Name: Ms. Julie Moffitt
Faculty Sponsor: Laura Baker
Category: Social Sciences
Submission: Individual
Format: Research Based
Title: Peer Victimization: Genetic and environmental influences
Description: Peer harassment in schools has become a leading concern over the past few decades, with research revealing substantial and lasting negative effects for both bullies and victims. Most research on victimization has focused on the identification of bullies and victims using behavioral

characteristics and peer nominations. However, there has been little or no effort to identify a genetic component of either bullies or victims, despite the substantial heritability of their associated personality traits.

The proposed study aims to explore the genetic contribution to victimization by comparing peer characteristics for pairs of MZ (monozygotic; identical) and DZ (dizygotic; fraternal) twins. The study is part of a larger ongoing twin study investigating the development of aggressive and antisocial behavior in children. The present analyses are based on subjects tested to date: 200 pairs of 9-10 year old twins living in the greater Los Angeles area, and their primary caregivers. The twins are administered surveys concerning their relationships with their peers including positive and negative peer interactions, extensiveness of their peer network, and peer victimization. Correlations for these characteristics are compared for MZ and DZ pairs, in order to investigate the role of genetic and environmental factors in peer interactions including victimization.



Name: Mr. Abdullah Munshi

Faculty Sponsor: Ann Crigler

Category: Social Sciences

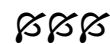
Submission: Individual

Format: Other

Title: Gandhi's Charisma

Description: Mahatma Gandhi is well known as a revolutionary charismatic figure in history. The people of India have historically been diverse. The Hindus are in the majority followed by the Muslims as the biggest minority. This co-existence can be traced back over the last millennium. However, ever

since the British colonized India, there has been a reactionary resurgence of fanatical elements in Hinduism in order to challenge Western imperialism. This sort of fundamentalism has bred extremism in India in recent centuries. Gandhi's personal influence played a significant part in ousting the British Raj from India. In many ways, Gandhi fits the classical paradigm of the charismatic leader, as described by scholars like Max Weber. Gandhi transformed emotions to further his goal of an independent India. Gandhi was able to transform the mutual anger Hindus and Muslims had for the British into emotions such as love and actions like peaceful protests and sometimes even unintentional violent riots. This alliance was successful up to a certain point. The Hindus and Muslims were "united" against the British as inspired by Gandhi, but were unable to live together as one nation after that goal was achieved. The reactionary element of Hinduism was too powerful to subdue for Gandhi. In fear of annihilation, the Muslims opted for a separate nation, Pakistan. Therefore, Pakistan was a result of collective fear. Gandhi was unable to transform the emotion of fear into love in this context. His charismatic authority was only effective to oust the British and not effective enough to resolve the mutual animosity that existed between Hindus and Muslims.



Name: Ms. Maggie Ney

Faculty Sponsor: Melvin Lyon,
William McClure

Category: Social Sciences

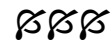
Submission: Group

Format: Research Based

Title: Time-patterns in behavior as signs of the organization of neural activity which precedes conscious..

Description: It appears that behavioral time-patterns (TPs) obtained using Magnusson's THEME method (M. S. Magnusson, 1999; 2000) have distinct relevance to the growth of structured relationships between behavioral events. These time-pattern structures are predicted to become increasingly more organized and complex with repeated attempts to achieve a maximally efficient reinforcement 'strategy', even with a problem that is inherently insoluble. A two-choice task, pseudorandomly reinforced with either knowledge-of-results (K) or coin rewards (RF), was given to schizophrenic (SCZ), anxiety disorder (ANX), and normal control (CON) subjects. The importance of the K and RF events is shown by the fact that these events are almost always the starting point for increasingly complex TP structures. Although SCZ subjects have previously been shown to have a greater number of significant TPs ($p=0.0001$) than controls (Lyon et al., 1994), the present study suggests that TPs of SCZ and ANX subjects are randomly distributed across sessions, while CON subjects uniformly show, as predicted, a distinct increase in significant TPs ($p=0.005$) in the second half of the session. Furthermore, if the total number of TPs per subject is divided by the total number of responses used to build these patterns, the TP production efficiency per response of the normal control subjects is actually greater than that of the SCZ subjects. These findings suggest that the orderly growth of TPs over time may be closely related to development of response-time relationships that eventually lead to

conscious recognition of a particular 'strategy' for attempting to solve a given problem.



Name: Ms. Jame Ortiz

Faculty Sponsor: Adrian Raine

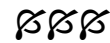
Category: Social Sciences

Submission: Individual

Format: Research Based

Title: Cooke's 3-Factor Model of Psychopathy and Startle Blink in a Community Sample

Description: Psychopaths have consistently shown abnormal emotional startle blink modulation patterns. This paper looks at startle blink data from a community sample of male subjects drawn from the surrounding area. Application of Cooke's 3-Factor Model to the psychopathy data from this sample significantly increased the predictive power of psychopathy scores for reduced emotional startle modulation.



Name: Ms. Alysia Piffero

Faculty Sponsor: Brian Lickel

Category: Social Sciences

Submission: Individual

Format: Senior Honors Project

Title: Vicarious Shame and Guilt in Romantic Relationships

Description: Imagine that you are with your romantic partner and he or she makes a racist comment. Or perhaps your partner doesn't leave a tip at a nice restaurant. Although you have done nothing wrong yourself, you may experience feelings of shame and guilt. This experience, of vicarious shame or guilt, is an intriguing but understudied phenomenon. Furthermore, beyond the intrinsic value of understanding how vicarious shame and guilt operate, these

emotional experiences may also have important implications for people's satisfactions in romantic relationships.

This study investigates vicarious shame and guilt as they are related to romantic relationships. The goal of the research is to investigate whether vicarious shame and guilt prevail in relationships with certain attachment styles, and how these emotions relate to relationship satisfaction.

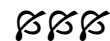
This project is of significance because although abundant research has been done on the distinct emotions of shame and guilt, little attention has been given to vicarious shame and guilt. Secondly, there are no studies specifically exploring the link among vicarious shame and guilt, attachment style, and relationship satisfaction. The results from this study may make us rethink the way we choose our romantic partners. We may discover the attachment style our partner should have in order to create the least amount of vicarious shame and guilt in the relationship and the highest amount of relationship satisfaction. This could help new couples determine the level of vicarious shame and guilt they would experience in their relationship and the level of relationship satisfaction they would have.



Name: Mr. Thomas Pintaric
Faculty Sponsor: Ulrich Neumann, Albert Rizzo
Category: Social Sciences
Submission: Individual
Format: Research Based
Title: Video-based Virtual Reality Exposure Therapy (VRET)

Description: Mental health professionals have traditionally treated phobias and anxiety disorders with a variety of cognitive behavioral therapy exercises that confront the fears in a real life setting. Virtual Reality (VR) overcomes the limitations of time, cost, control, and embarrassment by allowing the entire process to take place in the privacy of the therapist's office.

Unlike traditional VR environments, our system utilizes full motion, high-resolution, 360-degree video that moves with the user's head motions. Computer graphics (CG) and other video streams can be inserted on top of the panoramic video, allowing great flexibility in simulating mixed-reality environments. Our approach holds tremendous potential, especially in areas such as social anxiety and anger management therapy, where portrayal of human interaction is key, and traditional VR is still unable to reproduce convincing virtual human actors.



Name: Ms. Jessica Roberts
Faculty Sponsor: Ann Crigler
Category: Social Sciences
Submission: Individual
Format: Field Research
Title: The Myth of the Bitch: Feminists and Emotional Deviance
Description: Feminism tends to antagonize. However, why do many people find the idea of feminists so unsettling? I believe that the root of anti-feminist rhetoric lies in the feminists' transgression of certain social norms for female behavior, most specifically in the expression of anger. I am doing an online survey in order to test this hypothesis for my

undergraduate Political Science Honors thesis. I hope to prove that it is not the beliefs of feminists, but their behavior that explains why people have stigmatized this group.



Name: Mr. Matthew Sandoval
Faculty Sponsor: Richard John
Category: Social Sciences
Submission: Individual
Format: Research based
Title: The effect of casual versus professional attire of female customers on initiation of helping responses
Description: Since people judge books by their covers, we attempted to see if this principle applied to the department store setting. With this idea in mind, we set out to explore whether clothing attire had any affect on the latency in which a saleswoman received help. To test this theory we measured the time it took for our confederate to receive help from a department store saleswoman in one of two situations. In one situation the confederate was dressed in casual attire and the other she was dressed in professional attire while browsing the same section of the department store. We measured the time it took for the confederate to receive help from a saleswoman. We found that when the confederate was dressed in professional attire, the mean latency was significantly lower than when the confederate was dressed in casual clothing.



Name: Ms. Marissa Schleicher
Faculty Sponsor: Lynn Swartz-Dodd
Category: Social Sciences
Submission: Group
Format: Laboratory Research

Title: Natural Dyes of the Azapa Valley: Modern versus Ancient

Description: During the field season of 2001, we collected approximately 750 samples of Pre-colonial Andean textiles from the lower Azapa Valley, extreme north of Chile. Determining the dye content of these samples is of anthropological importance because previous research of Andean cultures has shown that dye choice was in direct relation to social status and political power. For this analysis, we processed samples through UV-Visible Light Spectroscopy. The limitation of this method, however, is that these spectra are meaningless unless they are compared with known standards. For this comparison we used two bodies of standards. First is a collection of natural dyes from around the world, assembled by Max Schweppe, housed at the Getty Conservation Institute (GCI). The other is of natural plant dyes used by modern indigenous people from the Azapa Valley, collected during the past decade. It was reasonable to suppose that the modern plant dyes from northern Chile would resemble those dyes used in ancient Andean textiles. However, the resulting spectra showed no indication of the use of modern dyes. Instead, five different standards from the GCI Collection, Cochineal, Relbunium, Annatto, Galium, and Indigo, repeatedly appeared during analysis. Unfortunately, there is still a large portion of the textile samples that do not match up with any identified dye standards, ancient or modern, indicating the need for further research.



Name: Ms. Celaine So
Faculty Sponsor: Kathleen Chambers

Category: Social Sciences

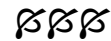
Submission: Individual

Format: Senior Honors Project

Title: Dose-dependent Effects of Estradiol on Hypophagia and Conditioned Taste Avoidance

Description: Estradiol, a hormone produced by the ovaries, reduces food intake by promoting early satiety during a meal and induces learned food avoidance. Increases in estradiol during the middle of the reproductive cycle are believed to work on a satiety mechanism to reduce food intake approximately 24 hours after peak hormone levels. On the other hand, the immediate effects of supraphysiological levels of estradiol when paired with distinctive tasting foods can induce conditioned taste avoidance (CTA). It has been assumed that these two effects are mediated by different neural mechanisms and that the satiety-producing effects occur when estradiol levels range from physiological to supraphysiological whereas the avoidance-inducing effects occur only when levels are supraphysiological. If the satiety-inducing versus avoidance-inducing effects of estradiol involve different neural mechanisms, then one would expect that the low physiological doses that produce satiety would not induce a taste avoidance when administered after consumption of a novel taste solution. This experiment was designed to test that hypothesis. Analyses of the data reveal that both a physiological dose (2µg) and a supraphysiological dose (10µg) of estradiol significantly reduced body weight as well as food and water intake compared to control animals. However, the 10µg dose induced a CTA while the 2µg did not. These results provide support for the hypothesis that the satiety and learned

avoidance effects of estradiol are mediated by separate neural mechanisms. The long-term implications of this research are tied to the hypothesis that estradiol may predispose females to anorexia nervosa.



Name: Ms. Lisa Sodetani

Faculty Sponsor: Elizabeth Zelinski

Category: Social Sciences

Submission: Individual

Format: Senior Honors Project

Title: Gender and Cohort Differences in Autobiographical Memory

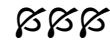
Description: Autobiographical memory, the recollection of memories from an individual's past, is important in understanding cognitive processes. Unlike other areas of memory research which shows declines in performance over time, autobiographical memory illustrates that memory for personal experience involves "reminiscence bumps," defined as the substantial number of recalled memories occurring between 10 and 30 years of age. Current theories suggest that the bump reflects encoding and retrieval of novel experiences relating to role changes from adolescence to adulthood. Little research has addressed gender differences, although women recall more than men and may have different experiences in socialization. These studies have shown slight gender differences although their sample sizes were relatively small. Using a Galton word-cue paradigm variation, participants (N=425) from the Long Beach Longitudinal Study were given 18 words to elicit memories and asked to record the age at which the recalled memory occurred. Participants were separated by gender and age groups by

decade, ranging from the fifties to the eighties. There were significant gender differences among all age groups, where the men had a steeper “bump” while the women produced a broader curve. However, there were no significant differences between age groups. All age/cohort groups experienced a slight recency effect of 20 years, indicating that differences in autobiographical memory can be attributed to gender and not the cohort effect. Results suggest that socialization for roles relating to adult behavior may involve less change for women than men, despite changes in women’s work roles since the 1970’s.



Name: Mr. Nick Sowers
Faculty Sponsor: Warren Techentin
Category: Social Sciences
Submission: Individual
Format: Creative Work
Title: High Density Housing Adjacent to the Freeway
Description: With the I-10 freeway so close, a quick response to the site on National Boulevard would be to shut oneself off from the intense noise and daytime eyesore. Upon further thought, there is a way to embrace the freeway, to accept its eroding qualities and reclaim the space by manipulating the groundplane. This 42-unit housing project is designed to be a typology for dealing with the vast stretches of land adjacent to the freeway. By rising up and terracing the opposite way, it not only generates wonderful living spaces for those within but also erases the presence of the freeway for those on the other side. The land between the terraced tower and the freeway is not wasted either. A Japanese Maple garden, which can grow even in the

tower's shadow, is a place for refuge, albeit with white noise from the freeway.



Name: Ms. Devyn Taylor
Faculty Sponsor: Joanne Farver
Category: Social Sciences
Submission: Individual
Format: Senior Honors Project
Title: The Influence of Children’s Negative Academic Experiences on Parent-Child Interactions
Description: The purpose of the proposed study is to better understand influences on parent-child interactions. The major goal of the proposed research is to understand how stressful experiences experienced by children at school affect the parent-child relationship later that day. Specifically, the proposed study will examine the effects of children’s negative academic experiences on the quality and amount of parent-child interactions, as well as examine any gender differences in children’s interactions with their parents following negative academic experiences.



Name: Ms. Thien-Tam Tran
Faculty Sponsor: David Andrus
Category: Social Sciences
Submission: Individual
Format: Research Using Secondary Materials
Title: Bought & Sold: Feminist Analysis of Trafficking in Women and Girls
Description: Human trafficking is an increasingly lucrative avenue of high profits and low risks for international criminal syndicates. Trafficking in women and girls is a systematic process of sexual exploitation that reduces women and their bodies to commodities: bought and

sold on the global market. This research paper sets out to identify common patterns in trafficking of women and girls for the purposes of sexual exploitation through a comparative analysis between Southeast Asia and Eastern Europe. The purpose of this research is to formulate a preliminary theory of sex trafficking. To inform this process of theoretical development, feminist theory will be used as the background for critical analysis using content analysis and a case study approach of regional differences. Secondary data included in the analysis are popular print media sources such as the New York Times, Economic, and the Washington Post from 1995 to May 2001. Results are organized into four levels of analysis: individual, society & culture, government, and globalization. This paper concludes that international sex trafficking of women girls is a circle of oppression in which citizen is denied in both the supply and demand countries. The global sex trade and exploitation are the causes and consequences of the oppression of women and their lives. Women are first exploited and victimized by false promises of a better life. They are also systematically oppressed by their improvised, subordinate, and subhuman positions in the society that they live. These women are further victimized by their limited economic freedom, government incentives for hard currency, and global factors that fuel the international sex trafficking business.



Name: Ms. Jaclyn Tsang
Faculty Sponsor: Ken Sereno
Category: Social Sciences
Submission: Group

Format: Research Based

Title: Research Study on the effects of speech delivery on perceptions of speech content

Description: Powerful speakers are more fluent, terse and direct in their speech. Investigations and research has revealed that speakers exhibiting powerful styles of speech are evaluated more favorably with respect to social power, sociability, credibility, competence, attractiveness and intelligence than speakers using powerless styles. (Bradac & Mulac, 1984a, 1984b; Erickson, Lind, Johnson, & O' Barr, 1978; Gibbons, Busch, Bradac, 1991; Hosman & Wright, 1987; O' Barr, 1982). However, there has been little attention given to how speaker's delivery affects the perception of content. Our research group is interested in finding out the effects of speaker's delivery on the perceptions of speech content. Our hypothesis is that speech delivery will have an effect on the perception of speech content.

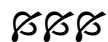
Two speeches of the same content are presented on videotapes. The only difference between the two speeches is speaker's delivery: One version with good/normal delivery, and the other with bad delivery. The audience, Annenberg Communication students, is asked to evaluate the speech in terms of speech delivery and content. Evaluations are analyzed to find out if speaker's delivery has an effect on the perceptions of speech content.



Name: Mr. Justin Weir
Faculty Sponsor: Dr. Laura Baker
Category: Social Sciences
Submission: Individual

Format: Senior Honors Project
Title: Genetic and Environmental Influences on the Comorbidity of ADHD and Conduct Problems

Description: Attention Deficit Hyperactivity Disorder (ADHD) is the most common neurobehavioral presentation to pediatric, neurological, and child psychiatric clinics in the United States. It is estimated to affect 3 – 5% of all school-aged children, with approximately four times more boys than girls being diagnosed (Biederman, 1991; Smalley 1997). In addition, 3-5% of children have some type of conduct problem, such as Conduct Disorder (CD) and Oppositional Defiant Disorder (ODD) (Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition, 1994). Untreated children with one or both of these disorders often experience peer rejection, school problems, and difficulty cooperating with teachers and parents—problems that may persist into adulthood. The frequent co-occurrence of ADHD and conduct problems warrants an investigation into the comorbidity of these two disorders, their subtypes, and the possibility of a distinct diagnostic category for the combined ADHD-Conduct Problem sub-group to explain the nature of their interaction. Multivariate genetic analysis will be applied to the data for 200 twin pairs, aged 9-10 years, who participated in the Southern California Twin Project. Genetic and Environmental influences in ADHD, CD, ODD, and their overlap will be presented.



Name: Mr. Michael Wiser
Faculty Sponsor: Lynn Swartz-Dodd
Category: Social Sciences
Submission: Individual
Format: Research Based
Title: Where the Past Meets the Present
Description: The wonders of the past hold a special appeal for the present. People

around the world have shown an incredible interest in Egypt's glorious past, with tourism being one of the prime industries of the nation. New technologies are allowing for new ways to preserve and present the past. Computer reconstruction of archeological sites can be valuable tools, both to give a sense of the experience of being there, and as an academic tool. This format allows for the easy transition between multiple theories, so they can be compared side by side. This project is one such reconstruction, focusing on the Central records Office of Tel el-Amarna, a one-time capital of Egypt. This building contained an unparalleled store of correspondence tablets between the Pharaoh and his equals in other states that have given us a glimpse at political life 3850 years ago, which first brought attention to the site. This project details the reasoning behind any design decisions made, documents the sources of why things were made the way they were, and sets the building within the scope of the city as a whole, which was the center of Egyptian society at this time period.

