# UNDERGRADUATE SYMPOSIUM FOR SCHOLARLY & CREATIVE WORK

## SCHEDULE OF EVENTS

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<th>Date</th>
<th>Event Description</th>
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<td>Tuesday, April 10, 2012</td>
<td>Symposium Judging</td>
<td>9:00 am – 5:00 pm</td>
<td>Grand Ballroom at Tutor Campus Center (Judges only – closed to presenters and general public)</td>
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<td>General Presentations, Exhibits, and Displays</td>
<td>11:00 a.m. - 2:00 p.m.</td>
<td>Grand Ballroom and Tommy’s Place at Tutor Campus Center</td>
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<td>Awards Ceremony &amp; Dinner Reception</td>
<td>6:00 p.m. – 7:30 pm</td>
<td>Town &amp; Gown</td>
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April 11, 2012

Dear Members of the USC Community:

It is my pleasure to welcome you to USC’s 14th 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 $1000 and Second Prize awards of $500 in each of the following categories.

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

A panel of distinguished faculty will judge submissions in each category. After the judging, you are cordially invited to attend the Award Ceremony at Town & Gown at 6:00 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,

Elizabeth Garrett
Provost and Senior Vice President for Academic Affairs
The USC Undergraduate Symposium for Creative and Scholarly Work provides undergraduates with the unique opportunity to exhibit and share examples of their significant research and creativity with the university community. This year, we have received over 140 submissions with participation from over 170 students. Students present work in a variety of ways, such as through poster/panel sessions, art exhibits, and electronic media. All undergraduates are encouraged to participate. For some students, the symposium serves as a culmination of work they have produced in partial fulfillment of a senior honors project, or a research project with faculty, both individually and as part of a program.

ACKNOWLEDGEMENTS

On behalf of the Office of Undergraduate Programs and the Office of the Provost, we graciously thank USC faculty and graduate judges for volunteering their time. The success of the undergraduate symposium is largely due to the contribution of their expertise in the judging process. We would like to give special thanks to the USC Helenes for their faithful service. Also, we would like to give a warm thanks to the faculty advisors who have sponsored students in this year’s Symposium. Your dedication to embrace teaching through inquiry-based learning has made this event as successful as it has been. And finally, we would like to express our gratitude to USC Stevens for their time, effort and commitment to this extraordinary event.

THANK YOU!!!
# 14th Annual Undergraduate Symposium for Scholarly and Creative Work

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The research will explore the myth, science and hidden stereotypes against people living with the hereditary genetic disorder of albinism. It manifests itself through an appearance of “white” skin, red eyes and other features not common to persons of African descent. Albinism affects all living species: humans, mammals, animals, reptiles, fish, and birds yet the genetic disorder is only seen in the context of being an aberration. It is my intention to bring attention to a subject matter that has received very little exposure, but has negatively affected so many lives. The project will include photography, sculpture, and paintings with a sound-scape and a video component. These mixed media works will document the mythical beliefs and practices, which negatively impact those living with albinism. People suffering from the condition are discriminated against and persecuted in many African countries. According to Jeffrey Gettleman from the New York Times, since 2007, dozens of people living with albinism in Tanzania have been killed and dismembered due to “a widespread belief that charms made from their body parts bring good fortune and prosperity.” These practices go unnoticed in Western societies, which contribute to the negative portrayal of albinos in contemporary media, mainly films. My research will provide a wide audience with facts about albinism through discussion, a video documentary and visual artworks.

The project is a journey to discover potential sites for a new form of art: Performative-Installation, which can be explained as a combination of performance art with installation art. A series of this kind of performative installations are set up at several selected ready-made sites on campus. Compared to traditional theatrical performance, this new form of performance communicates with its audience and the environment in a more silent, vision-oriented way. Every performance of this project is designed according to the aesthetic and practical characteristics of the selected site and the
involved space. It is the site that specifies the performance; the site, the body of the performers and any elements captured within the space of the happening performance are necessities that finally contribute to telling a story, stirring up a question and expressing an artistic or political view on social issues.

§§§§

Category: Arts
Name(s): Marcello Dolce
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Patrick Jackson, Roski School of Fine Arts; Ann Page, Roski School of Fine Arts
Format: Creative Work
Title: [_________]

Abstract:
The Helen Lindhurst Gallery at the Roski School of Fine Arts provided a platform for the existence of “[________]”. It was essential, however, to create a confining space within the larger gallery space in order to fully transform and transport viewers out of their known experience of that space and into an expanse of projected imagery. In order to condense the space, three existing gallery walls were sectioned off with a metal façade, which peeled away in the lower right hand corner, swooping out to reveal an internal environment within. Through this area of pried open metal, viewers were invited into a confined space and caused them to either sit or lie down inside. In this submissive, physically limited position they engaged in the visual consumption of the confrontational installation atmospherically comprised of three triangular shaped projection tunnels set overhead within the black crawl space. Each triangular projection tunnel with projectors fixed behind, were made of a series of layered screens that gave dimensionality to the projected imagery. Such technique created an infinite expanse of visual space within the confines of the actual viewing space. The projected imagery prompted a sense of simultaneous expansion and confinement, ultimately warping one’s normal spatial perception and stimulated a sense of disorientation. The projected images were direct representations of the frequencies emitted by the fearful experimental sounds playing in the background. This imagery was manipulated to emulate the momentum of the original indistinguishable sounds. The activation of the confined space through sound and moving image created an environment that positioned the viewer in an odd place of comprehension. Altering viewers’ perceptual and physical sensations through hyper tense awe inducing moments constantly confronted them with battling logics of scale created by the comforting and discomforting immersive audio and visual environment.

§§§§

Category: Arts
Name(s): Leah Rosengaus
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Angel Papadakis, School of Theatre
Format: Creative Work
Title: Arabian Nights

Abstract:
The production tells the story of Ali, a young street urchin who impersonates a prince and falls in love with the Sultan’s daughter. My challenge with this piece was to create a mature and artistic adaptation of a classically beloved fairy tale moment. I choreographed a grand pas de deux in my own style, which is rooted in contemporary ballet. In general my movement stems from the torso and incorporates many directional changes. The quality of movement differs between the two characters, with the princess being light and delicate and Ali more grounded and playful. The mood is whimsically romantic and builds in intensity until the final curtain.

Below are the artistic notes I submitted to
Director, Angel Papadakis for inclusion in the original 'script' of our production:

"The palace walls melt away and only the balcony remains as the night sky scenic design fades in. Prince Ali approaches the Princess at her balcony and the grand pas de deux follows. The carpet enters diagonally from stage left, out of the upstage wing. As Prince Ali and the Princess mount the carpet, chorus enter in all white and dance below. Close Act I as the Princess and Prince Ali share a kiss. Curtain."

§§§§

Title: Architecture as a Vehicle for Social Change in Southeast Asia
Name(s): Lori Chen
Project Sponsor(s) and Collaborator(s): Jinhee Choung, Political Science; James Steele, School of Architecture
Submission Type: Individual
Format: Creative Work
Title: Architecture as a Vehicle for Social Change in Southeast Asia

Abstract:
While studying abroad in Asia, the economic and social disparity between the various countries was prevalent, Sir Norman Foster’s HSBC Main Building towers over Hong Kong with the elegance of aluminum and glass, completely contrasting with the mud and straw hut that is still seen in Cambodian architecture. Social change is necessary in order for Southeast Asian countries to advance and overcome this disparity. This project draws from the thought that addressing housing, urban planning, and building development imbalances, we are one step closer to achieving a better Cambodia.

Whether it was fighting for independence (Vietnam from France), given independence (Malaysia from Great Britain), or continually consenting to colonial powers (Thailand to everyone), Southeast Asian countries have taken a long and strenuous road to what they are today. Singapore’s booming society was masterminded by Prime Minster Lee Kuan Yew’s economic reform that stemmed from being able to control housing and urban planning. By providing low income housing and building as fast as the population was growing, Singapore has had one of the best economies in Southeast Asia. In comparison, Cambodia has only seen stability since the fall of the Khmer Rouge regime in 1989. As one of the newest countries in Southeast Asia, it is also the least developed. While analyzing and designing the extension to The World Mate School #9 – a rural school on the outskirts of the Seim Reap province of Cambodia – realization hit that architecture was more than merely designing the most outrageous and attention-worthy creation. Architecture could be the solution for political policy. The extension for The World Mate School #9 takes into consideration the materials that are readily available, cost effective, and long lasting – so the design for one school could become an entire village.

§§§§

Title: Dead Palms
Name(s): Robert Amerson
Project Sponsor(s) and Collaborator(s): Bruce Forman, USC Thornton School of Music-Studio Jazz Guitar; John Hopson, USC Thornton School of Music-Studio Jazz Guitar; Neil Williams, USC School of Cinematic Arts-Production
Submission Type: Individual
Format: Creative Work
Title: Dead Palms

Abstract:
I am from Los Angeles. I have experienced what inner-city locals of South Central L.A. endure daily. I wanted to document the ethnography of residence and their environment, yet express it through the story of a young filmmaker’s documentary. I watched several movies by famous directors like Alfred Hitchcock and John
Singleton for both technical and artistic inspiration. I also listened to several Jimi Hendrix albums for musical inspiration. Through the finished product, I wanted to express my care for people.

§§§§

Category: Arts  
Name(s): Elizabeth Nonemaker  
Submission Type: Individual  
Project Sponsor(s) and Collaborator(s): Stephen Hartke, Thornton School of Music  
Format: Creative Work  
Title: Fantasy and Poem for Orchestra  
Abstract:  
Trying to explain how a piece of music “works” is a tricky task; so much of what catches our ear, and why, cannot be totally understood. What makes a melody beautiful? What makes certain chords so satisfying? And are we better off if we know the answers to these questions? Scientists tackle such questions frequently, but I can’t help but think they are somewhat irrelevant to fans and practitioners of music… After all, do their findings enhance the musical experience? Would knowing “why” a beautiful melody is beautiful make it more beautiful? Or perhaps it would be less so; perhaps a touch of mystery is crucial to musical enjoyment.

When discussing theory, or the anatomy of a piece of music, I think it is important to cultivate a sense of the ineffable – to keep in mind that a conversation about the aspects of a thing is not necessarily a conversation about the thing itself. Nevertheless, these concrete aspects are often all that can be discussed. Therefore I offer a breakdown of the form, themes, motives, and orchestral ideas in my own piece, “Fantasy and Poem for Orchestra,” all while encouraging my audience to remember that these comprise only a portion of the compositional process.

The focus of my presentation will be on form and dramatic structure, for these are, I believe, the most important features in creating the impression of a complete musical thought. I will then explain how subsidiary features – thematic treatment and orchestration – are used to support this wider idea of form. My hope is that listeners will come away from this presentation having gained two things: (1) a increased technical understanding of music and (2) a deepened sense of wonder for the communicative power of music despite its abstract nature.

§§§§

Category: Arts  
Name(s): Richelle Gribble  
Submission Type: Individual  
Project Sponsor(s) and Collaborator(s): Christopher Barnard, Roski School of Fine Art  
Format: Creative Work  
Title: From Neuron to Network Society  
Abstract:  
"To individuate the parts, there is more individuality within a context of similar individualities. How can an affinity be recognized if not through the establishment of relationships? Networks provide an identity to the parts of the system. We are built, life is built, organized and selected in the rhythms of the system’s relationships."

- Ángela Delgado (Networks, The Vital Principle)

A colony of social insects can be regarded as a single organism – one that reproduces, maintains its internal structure, and survives in hostile and unpredictable environments. Such “super organisms” – entities that consist of smaller organisms – are able to perform remarkable feats as unified forms. For instance, a swarm of ants in an anthill moves as a single colony – the swarm itself
functions as a singular, self-contained being. This inherent quality is prevalent in all network systems, including those of microorganisms, as well as those of human social interactions.

This series, From Neuron to Network Society, aims to depict the varied interplay between an individual and a collective mass through an array of network systems. Each work of art displays intricate layers and patterns to suggest the importance of systemic complexities in our everyday lives.

I find myself increasingly disinterested with representing the individual molecule, particle, or person; those entities must be defined through collective interactions, however chaotic those interactions may be. Indeed, the individual consistently becomes dwarfed by both the scale and density of these pieces. Much like the aforementioned buzzing anthill structure, these works display a sense of chaos and vibration that may or may not give way to more rigid forms. Ultimately, it is my goal that the viewer becomes lost in these systems, drawn in by the vivid colors and labyrinthine lines, until her own individuality has become a consequence of her surroundings.

§§§§

Category: Arts
Name(s): Anna Schulze
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Chris Sampson, Thornton School of Music
Format: Creative Work
Title: Give Me Freedom
Abstract:
Give Me Freedom by Anna Schulze

But as he wakes up to the evening news / That a city drown / It breaks his heart / And the shake of a hand is one last desperate stand / To reach the crowd

Give him freedom / Give him freedom

Flattened cardboard mattress, / Stretched along the city’s rumbling floor / A brand new pair of sneakers / Is enough to pad her shoulder for a year

As I close my eyes to a sleepless night / I’m as hopeless as the stranger downstairs / Voices from outside, I don’t recognize / Have taught me to always live in fear

Give me freedom / Cause I can’t breathe anymore / Give me freedom / I think I need some

Dust and smoke—the alleged plan / From the liquid in a soda can / A baby chokes with no backseat air / No charge against a mother’s care

Yeah we all need some / The girl outside your door / Yeah we all need some / Lying on the floor

Give him freedom / Give her freedom / Give me freedom / Cause we all need some

§§§§

Category: Arts
Name(s): Hailey Nowak
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Andrew Kutchera, Roski
Format: Creative Work
Title: I Had Definitely Decided
Abstract:
“Thirty Two Short Films About Glenn Gould” is based on Glenn Gould’s life while also bringing attention to the rhythmic beats in music. The object of the project was to incorporate Glenn Gould
into the art world while also analyzing the importance of typography. Based on a mixture of Jim Cogswell’s interest in abstract letters and beats from Gould’s music, “I Had Definitely Decided,” pushes the idea of what is language and what can be considered lettering. There is a very vague line that defines what can be typographic lettering. Who is to say what can be considered a form or language and what is merely pictorial? Fine arts has its own language and so does performative art. Is readability the most important element in language or is it interpretation and understanding? “I Had Definitely Decided” was designed to ask these questions to an audience who would otherwise not even be aware of the relationship between music and language and how it creates a rhythm that can be auditory or visual.

§§§§

**Title:** Last Dance  
**Name(s):** Celia Rettenmaier  
**Project Sponsor(s) and Collaborator(s):** Tanya Heflin, Thematic Option  
**Submission Type:** Individual  
**Format:** Creative Work  
**Abstract:**  
“Last Dance” merges formal dance technique, music, stage direction, and storytelling. In choreographing this dance, I sought to narrate the last goodbye between lovers. The piece focuses on three couples that have each realized their romance has dissolved and now recognize the need to move on. This goodbye is bittersweet; each person understands the necessity of the break-up but each is nevertheless hesitant to walk away. This dance is their last chance to be with their lover, and, at the end of the song, each couple must separate.

In order to portray this emotional struggle, I choreographed “Last Dance” in the lyrical and contemporary dance styles. I created movements with tension and rigidity to represent the anxiety, apprehension, and stress of this story. Most often, each dancer dances with his or her partner in order to depict the connection between lovers. I incorporated both physical contact and eye contact. At one point, the male and female dancers divide from each other; this represents the break within the couples. They now function as individuals rather than as a joint unit. After briefly reuniting to dance together, the piece concludes with each dancer walking away from his or her partner.

In addition to choreography and dance technique, this project also involved music and stage direction in order to portray the narrative. I chose to set this story to Tyler Ward’s acoustic rendition of “Slow Dancing in a Burning Room” because the haunting piano combined with Ward’s pained voice and dejected lyrics encapsulated my story. Furthermore, I chose somewhat basic stage lighting for the piece because its simplicity would force focus onto the dancers’ movements and emotions.

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**Title:** Quality Control Rejected  
**Name(s):** Brianne Harris  
**Project Sponsor(s) and Collaborator(s):** Jon Wagner, School of Cinematic Arts  
**Submission Type:** Individual  
**Format:** Creative Work  
**Title:** Quality Control Rejected  
**Abstract:**  
“Quality Control Rejected” includes collage, sketches, quotations, poetry and prose about three particular film theories, but serve as the manifestation of a cinematic arts student’s personal journey living out the very issues and liberations found in these early movements, from the frustrated disillusionment and powerful awakening of Realism, to the creative, self-conscious engagement of Formalism, to the
inquiry simultaneously raised and erased by
Classical Hollywood theory: Are we merely
spectators in the world, or are we creators
of it?

Frustrated with the college load, unsure
about continuing to graduation and
wondering what to do next, this student
was on the verge of walking away from
academia altogether, but found through
the creative process a deep revival of
inspiration, appreciation and passion for
learning and the arts.

§§§§

Title: Recreate your Perspective
Name(s): Kira Soderstrom
Project Sponsor(s) and Collaborator(s):
Olanna Mills, Department of American
Studies and Ethnicity
Submission Type: Individual
Category: Arts
Format: Creative Work
Abstract:
I have realized that I can transform my
artwork into whatever I want it to be. I like
to practice distortion in my photographs, to
make the real look unreal. To experiment
with the depth of field and by doing so
create an absolute new reality in my work.
Since I am an athlete I try to go to a
majority of the games at USC. The SC logo
on the baseball field really stood out to me.
It stood out to me because people are
proud. Athletes are proud. What is
interesting is that the best athletes get their
strength and ambition from being proud.
There is not a single athlete that wins the
gold who has walked up to the line with
self-doubt. I wanted to capture this simple
reality in my work by making our SC logo
the subject and sizing it up to be bigger
than it actually is. So by bending reality, I
have created a new perspective on what
typically people will gloss over. I have made
a logo larger than life. I have created a way
to see the baseball field that nobody has
ever seen it and for what its worth, I am
passionate about it. I am passionate about
understanding one’s own objectives and
coming to terms with what is happening. I
believe that it is important to give your all
in all aspects of life and to look at everyday
as though it is a gift and not a given right.
“I swing big, with everything I’ve got. I hit
big or I miss big. I like to live as big as I
can” -Babe Ruth.

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Category: Arts
Name(s): Tam Banh
Submission Type: Individual
Project Sponsor(s) and Collaborator(s):
Lawrence Scarpa, School of Architecture
Format: Creative Work
Title: Revitalizing Los Angeles River -
Taylor Yard Farm
Abstract:
Taylor Yard is an old railway switchback
yard that is no longer in use. The concrete
paved river and this industrial yard separate
the two neighborhoods on both sides of
the river: Elysian Valley and Glassel Park.

I propose to utilize the river and this
abandoned area as the mechanism to
reconnect these two communities. The river’s
concrete pavement was broken
down, and replaced with a stretch of
farmland on the east side, and wetland
area on the west side. This proposal also
allows the public to have an intimate
experience with the river.

The proposed program includes farming,
restaurant, gallery, educational
components to be affiliated with the
nearby charter school, and a bike kitchen
to accommodate bikers coming from the
Los Angeles River Bicycle Path. There are
two ways to access these programs, and to
cross the river: via multiple outdoor
bridging strands for bikers and pedestrians,
or via indoor pathways.

The site components include the outdoor
winding pathways, farmland, and wetland. On the terrain of farmland, various types of vegetable will be grown such as beets, kale, lettuces, etc. These produces will be used by the restaurant as well as sold in the adjacent market. There are also opportunities for community farmland, in which people from nearby neighborhood could come and grow their own produce in designated zones of the farm. The wetland area is reserved to support a variety of wildlife, as well as utilized as a way to filter out the polluted elements of the river.

The result is a vibrant public space that induces meaningful dialogues between the public and the Los Angeles River. Not only the project physically reconnects neighborhoods, it also provides a place for communities gathering, and allows the river to regain its meaning as a life supporting element.

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Category: Arts
Name(s): Timothy (Timo) Yates
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Robbert Flick, Roski School of Fine Arts
Format: Creative Work
Title: The Institution
Abstract:
The Institution is a collection of documentary photographs from contemporary Los Angeles. Our country is far from the top in average educational standards and this pattern is continuing. As a nation, we say we are focusing on education, but we have in fact left many students behind. My argument is not only that our processes and circumstances that have contributed to this failure, but also how we have constructed our centers of learning. As one might see in the series, many schools mirror the soulless textures, spaces, and attitudes of prisons. They are truly corrective institutions. Shouldn’t we think twice about where we send the future great minds during their most important developmental years?

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Category: Arts
Name(s): Hemmie Kang
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Ewa Wojciak, Roski School of Fine Arts
Format: Creative Work
Title: The Potential of Lips
Abstract:
As an artist, I dream to one day have my voice heard through what I’ve created and for what I’ve created to be accepted. However, to establish my ultimate goal, I’ve realized that the most crucial step for me to take is to first accept who I am, know what I believe in, and discover what my true style is. I believe that this step will not only allow me to come closer to my dream but to boldly have a personality that can shadow off true unique, art which may be accepted within the judgments of the world.

Therefore, this piece is not simply another body of work for my art portfolio, but a visual statement in my self-acceptance and my step to achieving my goal as an artist. This piece is not only a series of lips, but also a personal reflection of how I see beauty to be achieved. This piece is not based to visually appeal to an audience, but also to understand the truth- because I believe that within every individual, there is a voice that highlights the potentials to have a bold, beautiful personality. Therefore, I present this body of work that will portray the essential nature to be confident, passionate, and special.

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Abstract:
This project questions the conventional use of materials and the ways materials are usually connected and detailed. In order to showcase these issues, I decided to use hot glue as the medium for this jacket. First, I wanted to illustrate that hot glue can serve a different function other than being an adhesive. Secondly, I wanted to change the way we see materials, making use of the unattractive, extraneous strands that string from using the hot glue gun and transforming these strands into beautiful threads that provide the pieces to this jacket. To construct this jacket, only 45 small glue sticks were used. Strands were pulled from the hot glue gun, which were used to construct the "fabric" pieces. These pieces were then sewed with hot glue thread and finished off with hot glue buttons. As a result, a functional, durable, and wearable jacket was created out of hot glue. The material qualities of this jacket provide different layers of transparency and different spatial implications. The transparent quality of the jacket gives it dual characteristics of having presence and not having presence, of being seen and not being seen. This hands-on manipulation and exploration of the material allowed full understanding of the material's properties and capabilities and this method of crafting and generative detailing allowed hot glue to transcend its conventional function and expected qualities.

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Category: Arts
Name(s): Stacy Kwok
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Lee Olvera, Architecture
Format: Creative Work
Title: Truth in Making, Craft: An Architectural Inquiry

Abstract:
Public spaces have been resuscitated by the ninety-nine’s search for political efficacy. As individual persons congregate in urban centers, momentum is generated in density. Consolidation, in favor of a unified collective, becomes paramount to the movement’s survival. Severed from singular identities, members are understood as not wholly unto themselves, but belonging to a singular figure, body, with distinct, closed boundaries. Consequently, the multiplicity of bodies becomes reducible to its appendages. Within such a schema, scale and density become preeminent strategies for articulating offense and power.

These tactics are further intensified by the mode of demonstration: to occupy space. In the midst of mania, the most shocking stance is to remain static. It is easily perceived that the residential qualities of this collective have altered the nature of the public space. But it is not this aspect of the lack of rapid shifts, the dialectical and discursive qualities of the insurrection, which gives rise to a new typology. By operating as a point of gathering and settlement, the public space manipulates human figures into stationary objects. Already, the occupation is the microphone, the billboard. Now, the occupation is architecture. Installed in public space, bodies become building blocks; limbs and torsos, the structure.

To make manifest, to monumentalize, and to give form to this latent urbanism, Up in Arms! envisions a skin fashioned from articles as precise as the white shirt at the level of the solitary body. Tailored with specific forms that demarcate the natural
contours of the one, the discrete white shirt is dismembered and mutilated in parallel to the urban form's underlying elements of necks, arms, wrists. These fabric components are reconstructed as a white field, a new landscape of seams and folds. While retaining a semblance of its origins, the white shirt now envelops a new urban form.

### Welcome to Beautiful Juarez

**Category:** Arts  
**Name(s):** Erin Cuevas, John Farrace  
**Submission Type:** Group  
**Project Sponsor(s) and Collaborator(s):** Mario Cipresso, School of Architecture  
**Format:** Creative Work  
**Title:** Welcome to Beautiful Juarez  
**Abstract:**  
While the design acts as a prototype for the entire border, we focused primarily on the city of Juarez - the heart of drug trade, with one of the highest rate of homicides. The supporting narrative operates on the assumption of a new government policy, where Juarez has been allocated money to reconstruct the economy and infrastructure within the city. The drug cartels, with their strong presence in Juarez, inevitably contribute to this development, generating spaces for their use. The new developments in Juarez directly affect the city’s neighborhoods themselves, but also indirectly affect America - in terms of shifting perceptions of the city, and of Mexico in general.

The formal design approach explores different ways of generating large spatial moves that are both easy to make, but also big enough to alter the fabric of the city. The ground is manipulated using inexpensive and readily-available means of machinery and explosives -- ones that are already in abundance due to border construction and violence in the city.

Throughout the development of the project, we explored the many cultural and social implications of generating a project in a foreign area. In the end, the produced imagery exploits the potentials and risks of attempting an architectural solution to Mexican drug cartels (or any other foreign issues) in general.

### Wonka Rewrite

**Category:** Arts  
**Name(s):** Rita Yeung  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):** Andrew Kutchera, Roski School of Fine Arts  
**Format:** Creative Work  
**Title:** Wonka Rewrite  
**Abstract:**  
This was for a design class. We were to think of a project that had a web component. I wanted to try something more traditional rather than rely on digital mediums, so I condensed Roald Dahl's Charlie and the Chocolate Factory. All of the text and images are handwritten and hand drawn. The type changes according to which character is talking. I also used watercolors for the images.

Having the book online has certain benefits. For one thing, it is easier to access by all. Another thing is that I could play with different HTML coding. Although it is simple. I feel that the splash page at the beginning with the Wonka bar adds a certain charm that draws in the viewer, which could not be achieved simply from looking at a physical book.
Disney’s latest release, The Princess and The Frog, is only minimally different from the previous representations of black people in Disney movies. Princess Tiana, the film’s central protagonist, is decidedly human, but only for a small portion of the movie. She spends the majority of her screen time as a frog. It would be irresponsible of me as an African American Studies student and “fan” of Disney to neglect how race functions at the level of imagery, symbolism, and even ideology within Disney movies. I admit to having been excited by the prospect of Disney’s latest film; I was glad that little Black girls would finally have a face in the Disney Princess line-up with which they could relate. But I was disappointed by the way Princess Tiana’s story played out. In addition to her being a frog for the majority of the film, her fairytale happily ever ending palled in comparison to the rest of Disney’s Princesses.

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Pete Townshend’s legendary rock opera “Tommy” (1969) tells a story of hardship, success, downfall as well as a quest for self-realization. The primary focus of the album is the hero’s journey up to his demise. Tommy, after witnessing the murder of his father becomes deaf, mute, and blind. Despite trials and suffering, he becomes a celebrity-Messiah figure. He is viewed as a champion of truth and freedom, but is later rejected by the people who catapulted him into fame after his senses are restored. I analyze this album within the theoretical framework informed by Emerson’s “Self Reliance”, Marx’s writing on the individual in the Grundrisse, and Thoreau’s “Solitude.”

I argue that “Tommy” celebrates the themes of self-isolation, inward exploration of the mind and the senses, and solitude.
For Pete Townshend the success of the individual relies on a deep-seated understanding of self and that Tommy’s downfall is due to his losing touch with that understanding, as he becomes something greater than himself. Tommy’s original quest for truth leads to him becoming an idea that he loses control of.

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Category: Humanities
Name(s): Cassandra Stover
Submission Type: Individual
Project Sponsor(s) and Collaborator(s):
Diana Blaine, The Writing Program, and Gender Studies; USC Dana and David Dornsife College of Letters, Arts and Sciences
Format: Analytical Paper
Title: Damsels and Heroines: The Conundrum of the Post-Feminist Disney Princess
Abstract:
My research initially analyzes the historic appearance of Disney females in relation to the women’s movements. Disney continually remolded its princess in accordance with contemporary gender standards, to maintain relevance both in actions and characteristics. These idealized representations of women corresponded to cultural desires for women to retreat from active roles, and appealed when widespread anti-feminist backlash shifted the women’s movement away from its objectives.

My research also examined lingering anti-feminist backlash in representations of postmodern Disney heroines. Disney builds its post-feminist princess narratives through the struggles of feminism, presenting a strong woman designed to appeal to the liberated girlhood, who does not fit in with societal gender constructions and longs for something more, a common trope in all princess films of the 1990s. However, Disney uses post-feminist rhetoric to commandeer female autonomy towards post-feminist goals. For example, the ability for a woman to choose what she wants becomes the ability to choose the right prince. Disney also repeatedly uses “The Daddy's Girl,” which reduces strong females into girls seeking their father’s approval.

Finally, I examine the implications of post-feminist discourse for young female viewers. The autonomy of female characters onscreen justifies their objectification in the realm of advertising, where strong heroines are reduced to dress-up dolls. Additionally, when girls emulate these princesses through dress-up, they internalize a notion central to post-feminist discourse: the illusion of the power of being looked at. Disney’s marketing of “traditional” Disney princesses alongside its recent females problematically blurs gender ideals, resulting in products that equate independence and agency with attractive appearance in the eyes of the consumer. When little girls process these images, the ability to identify with a strong female character becomes the desire to dress like her, to emulate in appearance not action.

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Category: Humanities
Name(s): Anu Ramachandran
Submission Type: Individual
Project Sponsor(s) and Collaborator(s):
Erin Moore, Anthropology
Format: Field Research
Title: Faith: Friend or Foe? The Rise of Faith Healing in Tanzania and Its Impact on Community Understanding of HIV
Abstract:
Faith healing is the treatment of illness through religious belief or prayer rather than through modern biomedical practice (Hall, 2010). It is a well-established global phenomenon whose effect on global health initiatives in developing countries
remains largely unknown. Though often dismissed by health organizations, the emergence and prevalence of faith healers in areas such as South America and East Africa has had an incomparable impact on the cultural understanding of disease and treatment. Indeed, the widespread notoriety of such figures often translates into a form of credibility, allowing their ideas to pervade popular culture (Hall, 2010).

Specifically, the recent rise to fame of Babu of Loliondo, a Tanzanian faith healer who claims to have the ability to cure HIV, has created a cultural and logistical crisis for NGOs and other health organizations working with rural communities in Tanzania, particularly in the area of education (Ibrahim 2011 July 9). The impact of Babu’s faith healing on HIV education efforts in rural communities highlights the need for global health organizations to acknowledge faith-based phenomena. In turn, this will facilitate collaboration with these communities as how best to address the problems posed by Babu and similar faith-based figures.

This project investigates the origin of Loliondo’s faith healing movement and the factors leading to the popularization of Babu as a faith healer. Furthermore, it surveys the impact that the Loliondo phenomenon has had on a specific rural community’s understanding of HIV and on the interface between biomedical and faith-based treatment interventions. Finally, it addresses potential community-based initiatives that NGOs and other health organizations can support to address this and similar situations with consistency and cultural understanding.

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**Title:** Inside the Getty Villa: Sourcing Ancient Design

**Name(s):** Samuel Treviño, Alexandria Yen, Alexandra Zigrang

**Project Sponsor(s) and Collaborator(s):** John Pollini, Art History; Ambra Spinelli, Art History

**Submission Type:** Group

**Category:** Humanities

**Format:** Analytical Paper

**Abstract:**

Inspired by his world travels, J. Paul Getty desired to bring a Roman-style villa to his property on the Malibu coastline. Breaking ground in 1970, architectural historians began forming a foundation for the Getty Villa Museum based on the archaeological remains of the Villa de Papyri in Herculaneum. Due to the first century CE eruption of Mt. Vesuvius, this structure’s preserved remains provided a snapshot of ancient villa design. Although the Villa de Papyri forms the foundation for the museum’s structure, the architectural historians also took inspiration from structures and artistic elements all over the Roman Empire. Our research will discuss the aesthetic choices made by these architectural historians, highlighting numerous examples of Roman villa design. While many of these decisions were heavily documented and annotated, the historical record currently lacks a complete version of all the ancient sources for the Getty Villa Museum. Based on primary sources, including personal correspondence between J. Paul Getty and leading archaeologists, our research accomplishes the first full annotation of all aesthetic influences from antiquity that contributed to the Getty Villa’s construction.
MACRO-MAPPING THE MAYA: A LARGE-SCALE GIS ANALYSIS OF MAYA SETTLEMENT PATTERNS IN BELIZE

Anna Bishop

Lynn Swartz Dodd, Religion Department

Laboratory-based Research

Archaeologists study settlement patterns (the layout and distribution of sites) in order to determine trends in social structure, economic development and political control. For 60 years, principles of landscape settlement archaeology have been used to understand how the ancient Maya in Central America lived and interacted with their surroundings.

My long term project is to create a geographic information system (GIS) resource that includes all known Mayan sites, from all periods. No up-to-date, publicly-accessible resource exists presently. Mayanists Walter Witschey and Clifford Brown, began this effort in 2001 but did not enlarge the open access database after 2006. My research project takes up where they stopped.

In the first phase of my research, I focused on discoveries made in Belize in the last six years. This GIS dataset is a research tool for Mayanists working in Belize and for me. I am building a tool that will enable large-scale visualization of the expansion and contraction of the Mayan poity through time, and which facilitates cross-site analyses, environmental modeling and regional comparison within the larger Mayan world. The file will be shared with all contributors.

By being able to map specific attributes by site, my research allows archaeologists to find and interpret new, culturally-significant patterns. Additionally, the large scope of this map will provide a new macro perspective of trends to archaeologists. Using this database I am able to identify settlement trends of the Maya over space and time. Additionally, I am building this resource in accord with new NSF and NEH guidelines which mandate creation of publicly accessible research outcomes for grant-funded research. In graduate school and beyond, I will be writing such grants, so I am building a foundation and a track record for my future.

Necessary of Life: Henry David Thoreau’s Concepts of America’s Problematic Progress, 1837 – 1862

Gregory Woodburn

Karen Halttunen, History Department; Brett Sheehan, History Department

Senior Honors Thesis

The final twenty-five years of Henry David Thoreau’s life, from 1837 to 1862, were among the most transformative in United States history. Rather than viewing loss as total and progress as inevitable, Thoreau applied nature’s cycles of growth, decay, and rebirth toward a circular temporal structure that challenged notions of irreconcilable loss and linear progress.

While Thoreau’s early writings included the narrative structure of a journey, his cyclical temporal framework became much more robust in his two published major works. A Week on the Concord and Merrimack Rivers bridged Thoreau’s personal feelings of loss after his brother’s death with larger losses facing America. Walden bridged his societal critiques with efforts to demonstrate to others the true necessaries of life.

This thesis expands on Thoreau scholarship by exploring the tensions between his
cyclical understanding of time and contemporary notions of linear, continual progress – specifically in relation to ideas of permanent loss and continual improvement. The Introduction provides context on how Thoreau’s lifespan corresponds with an era of unrivaled growth, change, and modernization in Massachusetts and the United States. Chapter One traces the development of Thoreau’s articulation of time as a journey to a cycle from his earlier writings through his first major work, A Week on the Concord and Merrimack Rivers, as well as Thoreau’s attempt to understand the death of his older brother John not as permanent loss but rather as an instance of decay within the larger natural cycle of decay and rebirth. Chapters Two and Three focus mainly on Thoreau’s other published book, Walden, and the evolving tensions Thoreau displayed between cyclical time and progress, as evidenced through the gray area where nature and industry converged. Finally, the Conclusion of this thesis offers a brief look at the legacy of Thoreau, his world, and his words.

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Category: Humanities
Name(s): Daniel Rios
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Erin Graff Zivin, Spanish and Portuguese and Comparative Literature
Format: Analytical Paper
Title: Other Ethnic Imaginings: The African-American Presence in Roberto Bolaño's 2666
Abstract: This study examines the symbolic presence of African-American figures in Chilean author Roberto Bolaño’s novel 2666. Specifically, the study looks at how the novel and its African-American characters conceptualize the transnation and transnational identity, especially as it exists in a manner that is distinct from the aesthetic and political legacy of the Latin American literary “Boom.” In addition, it builds upon existing notions of inter-ethnic literary production in order to outline its significance as an evolving theme in transnational literature. Drawing upon post-colonial, transnational, and globalization theory, as well as race and ethnicity studies more broadly, the study takes the African-American figure and its legacy of violent subjugation within the United States and explores the functionality of this narrative legacy within the aesthetic and political aims of contemporary Latin American literature. In doing so, this study explores ethnic solidarity as it exists between the United States and Latin America and interrogates the tension between anachronistic conceptions of rigid national identity and notions of untethered globalization.

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Category: Humanities
Name(s): Nelly Chavez
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Maria Elena Martinez, History and American Studies
Format: Analytical Paper
Title: Questions of Hegemony: Witchcraft, Power, and Cultural Resistance in Colonial Mexico
Abstract: The study of witchcraft has often been characterized by the ignorance of those who would label it as such: although this phenomenon is a part of many historical and popular imaginaries, it is often poorly understood. The historical treatment of this phenomenon often fails to address the cultural environment that gave rise to it as well as its importance in creating a more complex subaltern history. In the early modern Iberian world, various forms of witchcraft were common cultural practices. Despite this, the study examines the symbolic presence of African-American figures in Chilean author Roberto Bolaño’s novel 2666. Specifically, the study looks at how the novel and its African-American characters conceptualize the transnation and transnational identity, especially as it exists in a manner that is distinct from the aesthetic and political legacy of the Latin American literary “Boom.” In addition, it builds upon existing notions of inter-ethnic literary production in order to outline its significance as an evolving theme in transnational literature. Drawing upon post-colonial, transnational, and globalization theory, as well as race and ethnicity studies more broadly, the study takes the African-American figure and its legacy of violent subjugation within the United States and explores the functionality of this narrative legacy within the aesthetic and political aims of contemporary Latin American literature. In doing so, this study explores ethnic solidarity as it exists between the United States and Latin America and interrogates the tension between anachronistic conceptions of rigid national identity and notions of untethered globalization.
That provided the marginalized populations of the public a way to renegotiate the terms of engagement with the hegemonic powers of the day.

That witchcraft was mostly accessible to the marginalized populations of the Iberian world not only shows this form of power functioned as a subtle form of resistance to hegemonic cultural and political discourses, it also shows that by classifying it as a punishable element of the Other, it was granted a space by the hegemonic powers with their constant designation of these practices as attempts against the established and accepted social order.

Thus, this project attempts to address the ways in which witchcraft offered a means of resistance by marginalized women in colonial Mexico. Within the dialogue of physical and ideological oppression, some women found ways to negotiate the terms of control over their lived experiences by drawing upon what was largely deemed as women’s powers. This witchcraft was performed to address a variety of needs, such as personal and economic security, that were not fulfilled or protected by the state and its authorized institutions. As such, the performance of witchcraft enabled some marginalized women with agency when official institutions were either blind or inattentive to their needs.

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**Category:** Humanities  
**Name(s):** Parin Patel  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):** James McHugh, Religion  
**Format:** Laboratory-based Research  
**Title:** Remember What Siddhārtha Said under the Banyan Tree?: Safeguarding Material Culture in Modern-Day Anti-Buddhist Gandhara  
**Abstract:**  
The main question an archaeologist asks is, “Why”? Archaeology is simply the effort to understand the human past through the analysis of material culture. Material culture pertains to any physical remains that were used by humans. This can range from pottery and lithic artifacts to literary texts and human remains. Archaeologists take this material culture and analyze it in order to develop a clearer understanding of past civilizations.

The aim of archaeology is to decipher and preserve the legacy of past cultures. Some regions are in a more urgent need for preservation and protection. The area of Gandhara, located in modern-day India, Afghanistan, and Pakistan, is one such example. Due to the anti-Buddhist regime in the region, Buddhist material culture has been under attack for the past few decades. The Afghani government, in particular, destroyed many Buddhist artifacts in museums throughout the country. The most notable desecration of Buddhist material culture was the destruction of the Bamiyan Buddha statues in 2001. These statues, measuring 114 and 165 feet in height, were the largest known depictions of the Buddha in the world.

The aims of this project are to analyze the Gandharan Artifact Collection in the USC Archaeological Research Center in order to decipher the meaning behind these artifacts and to utilize Polynomial Texture Mapping (PTM) technology to preserve and distribute digital recreations of the artifacts in the collection through the Inscriptifact Artifact Database. The digital PTMs will last long after the physical artifacts are gone and will also provide an “online museum” to anyone interested in Gandharan culture, free-of-charge. In addition, I plan on recreating a Buddhist stupa, a reliquary structure used to house important artifacts and burial remains of important Buddhists, by deciphering and incorporating actual stupa fragments into the recreation.

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Title: Story-telling in Moroccan Arabic: Investigating speakers’ referential choices in narratives

Name(s): Boutaina Cherqaoui

Submission Type: Individual

Project Sponsor(s) and Collaborator(s):
Elsi Kaiser, Department of Linguistics

Format: Field Research

Abstract:
Most of us can carry a conversation with multiple pronouns (s/he, it, they etc.) and have no difficulty discerning who/what those pronouns refer to and when to use them. Although this task seems natural and effortless, it is one of the fundamental building blocks of human language and communication. What comes naturally to us is very challenging for computers, which struggle to digitally translate a full text correctly or interpret a conversation. People affected by Autism and Alzheimer’s disease also have difficulties using and interpreting pronouns efficiently. All the above are meaningful outlets for this research project.

I investigated pronoun use in Moroccan Arabic with an elicitation task: Thirty people each told four stories, represented by a series of pictures. Each story had a primary and a secondary character. The stories were recorded and transcribed. I analyzed pronominal patterns in the narratives, as well as the nature of language-switching (Arabic/French). Moroccan Arabic has both null and overt pronouns: It is sometimes possible to leave out the pronoun (e.g. “Peter came home. [Null] wanted to sleep”). I analyzed how often overt and null pronouns were used for primary and secondary characters. Another important and revealing analysis was the distribution of the pronouns throughout each story depending on the grammatical function of the pronoun and its referent (e.g., subject vs. object), and the use of other referential forms beyond pronouns. Broadly speaking, I found fundamental differences in how people refer to the primary vs. the secondary character, even when the secondary character is more important in the immediate local context. As a whole, my findings point to a close interplay between global discourse structure and use of null/overt pronouns. In future work, I plan to look more at the language-switching patterns in the narratives, to see how they relate to pronoun use.

>Title: Testimonials at Angelus Temple

Name(s): Jennifer Escobar

Submission Type: Individual

Project Sponsor(s) and Collaborator(s):
Richard Flory, Sociology; Donald Miller, Religion

Format: Analytical Paper

Abstract:
This research project examines testimonies that are a regular feature of services at Angelus Temple in Los Angeles. The testimonies are given by individuals who are in various stages of recovery programs offered by the church. The study uses recorded testimonies at Sunday morning services. It examines one testimony from each month over the last four years. The purpose of the study is to explore how the person testifying understands their relationship to God and how the testimonies may relate to the people in the church or the church overall. I hope to discover what the testimonies reveal about how the individuals testifying understand their life journey and how they frame their relationship to God given where they are (per their testimony). This research will provide valuable information regarding what testimonies can reveal about personal change and transformation and about the kinds of stories publicly told in this church.
Category: Humanities
Name(s): Rikiesha Pierce
Submission Type: Individual
Project Sponsor(s) and Collaborator(s):
Lanita Jacobs, Anthropology
Format: Creative Work
Title: The Educational Success of Soulful Humor in Communities of Color
Abstract:
This is a multi-method and multi-disciplinary project rooted in anthropology, African American studies, and performance studies. It is an investigation of the complex relationship between black comedy—that is, humor produced by African-Americans that is geared towards an African-American audience—and the social narrative of the black American experience that is often condensed within the narrow framework of an authentic performance of blackness. The research entails a close examination of several African American female standup comic performances, a performance intervention campaign, interviews and focus groups to gauge its effectiveness. Its innovation is a highly reflective performance ethnography piece that will compliment a multi-year investigation of theories of humor, race, gender, even literature that bears upon the kind of "soul work" that these comics grapple with in pursuit of complex comedic truths. This research bears on self-reflexive-ness, ultimately commenting on the universal struggle that people of color must often endure when trying to construct a sincere portrayal of their identity, and the politics of performance used to legitimate these realities.

Category: Humanities
Name(s): Marrissa Emond
Submission Type: Individual
Project Sponsor(s) and Collaborator(s):
Robert Delgado, Biological Sciences
Format: Field Research
Title: The Past and Present Menstrual Practices of the Dayak of West Kutai, Borneo: An Examination in Context for Behavioral Ecology and Sociobiology
Abstract:
Cultures are not stagnant, but rather can evolve and change over time. The practices of a population should not interfere with an individual's fitness, but rather change to suit the environment. If a people were not able to adapt their culture to suit a changing environment, then they would lose fitness and eventually die out. Religious practices, including menstrual practices should follow the same pattern. Prohibitions and puberty rites associated with menstruation should be adapted and changed by the individual population to confer fitness on the people that follow these practices.

The Dayak follow this pattern among the seven villages that I first examined, and also in the later eight that I visited on my second trip. The indigenous menstrual practices can be explained as conferring fitness onto the people through spiritual belief and thought. Prohibitions seeing menstruation relate to prevention of disease; prohibitions on discussing menstruation confer a potential benefit to females by creating paternity uncertainty; prohibitions on farming provide a method to let women rest during a time of bodily change; and rites associated with menarche once conferred a higher reproductive potential by providing opportunity for early marriages. These practices have been modified slightly or to a high degree, depending on what is beneficial for the current environment in which that the society resides. The model of the Dayak
show how specific an examination may be required to see the reproductive benefit incurred. The individual villages and even the informants need to be examined to fully understand how any culture is evolving. As we can examine our own culture as insiders and see multiple potential benefits or drawbacks to practices, so do we need to immerse ourselves in a culture’s environment before we can fully understand the changes that are occurring in a population’s practices.

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**Title:** To Intern or Not: Analyzing the Parallels of Pearl Harbor and 9/11  
**Name(s):** Mary (Jem) Jebbia  
**Project Sponsor(s) and Collaborator(s):** Duncan Williams, Religion  
**Format:** Senior Honors Thesis  
**Abstract:**
In this Honors Thesis, I explore the precursors to both Pearl Harbor and 9/11, including policies on immigration, laws passed, Supreme Court cases, and American public sentiment, especially portrayed by interest groups. These factors ultimately influenced decision makers like President Roosevelt and the George W. Bush Administration to pursue specific courses of action after each attack that affected Japanese and Muslim Americans living in the United States. I analyze the difference between the attacks, one during a time of war, and one not nationally based, and seek to answer the question, “Why did the United States government decide not to intern Muslim Americans after 9/11 as they did Japanese Americans after Pearl Harbor?”

In order to answer this question, I provide an analysis of American sentiment and foreign policy before each attack, the rhetoric of American government leaders, legislators, and the public immediately following the attacks, and most importantly the motivations of interest groups to promote or discourage the internment of Japanese and Muslims. These interest groups include local politicians, religious institutions, activists, and minority groups. I explore the age of restriction on immigration in the United States from 1882-1965, and the legacy Immigration Acts left that contributed to the decision to mass incarcerate Japanese Americans under Executive Order 9066. Interest groups that called for the protection of or sacrifice of civil liberties after Pearl Harbor find parallels with interest groups after 9/11. The precursors, rhetoric used immediately after each attack, and interest groups played essential roles in influencing the decision to intern Japanese Americans and to place strict surveillance on Muslims. More recently, these factors have also played a role in the decision to create and sustain the jail at Guantanamo bay, producing much controversy around the idea of civil liberties in the United States.

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**Title:** What Is A King To Do: An Investigation of Images of Kingship  
**Name(s):** Grant Dixon  
**Project Sponsor(s) and Collaborator(s):** Lynn Swartz Dodd, Religion  
**Format:** Analytical Paper  
**Abstract:**
My research centers on a Greco-Roman Egyptian terracotta figurine that shows an image of a Roman emperor dressed in military costume smiting a barbarian enemy. The identification of this artifact proved challenging because we possess no details about its place of excavation and because it is an unusual image. This meant that a study of its form, content, and style would be required in order to attribute the ancient object to its original time and place. After an extensive study, I determined that
the Romans adopted a classic Egyptian royal “smiting the enemies” pose and transformed it into a document of Roman domination over Egypt. Additionally, I believe the emperor depicted is Hadrian, which suggests a date range for the artifact.

Once I had identified the type of image, I conducted a detailed study of its use in Egypt and the Roman Empire in order to understand its cultural and historical significance. I also conducted an international search for similar objects. My research revealed that this USC terracotta figurine is a rare, high-status artifact, even though it is made of clay, which was not an expensive material. Fewer than five other examples exist in published collections anywhere in the world.

This figurine is important for another reason: some of its red and green paint is still preserved. I collaborated with David Scott, conservation scientist of the Getty /UCLA Conservation Program and used XRF analysis and polarized light microscopy to identify and analyze in order to identify and analyze the paints and pigments. This will enable me to recreate the original appearance of this artifact digitally and though a 3D model that can be displayed alongside the ancient object.

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Category: Humanities
Name(s): Mary (Jem) Jebbia, Michelle Lim
Submission Type: Group
Project Sponsor(s) and Collaborator(s):
Lynn Swartz Dodd, Religion
Format: Laboratory-based Research
Title: Why Settle For Less?: Diachronic Shifts in the Human Landscape of the Amuq Valley
Abstract:
The Amuq Valley Regional Project focuses on the coastal region of Turkey near the ancient city of Antioch/Antakya and documents human-environmental interactions over thousands of years. The project members seek to understand changes and patterns in ancient settlement as part of an overall regional settlement frame for an area of significant cultural and political exchange. Seventy years of archaeological survey, including work by USC students in recent years, have enabled identification of 396 sites ranging from the Paleolithic period to the present. These have been incorporated into an extensive research database for spatial analysis and visualization within ArcGIS. In order to identify changes in the settlement strategies over time, we mapped the sites according to periods of occupation while keeping in mind environmental and political shifts in the region. As a result, we have been able to visualize the relationships between contemporaneous settlements, the geographic landscape, water sources, and major trade and travel routes. We noticed a dramatic decrease in settlement in the northern sector during the Middle and Late Bronze periods, which suggests a strategic decision to minimize investments in that area and create a negative buffer zone to separate contested territories. Conversely, we see a dramatic increase in northern settlements during the Early Islamic Period, which suggests the transformation of the region into a near-frontier zone in which people who are specially-adapted to living in wetlands constituted a human reservoir along the frontier or the Byzantine and Islamic empires.

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Category: Humanities
Name(s): Katherine Ricci
Submission Type: Individual
Project Sponsor(s) and Collaborator(s):
Craig Dietrich, Institute for Multimedia Literacy
Format: Creative Work
Title: Women by the Numbers
Abstract:
Women of the Web is a web project designed to investigate both the good and bad roles that women hold in society. On the one hand there are women like Oprah, Michelle Obama, an Ellen Degeneres who have done wonderful work in creating a positive image of powerful women. On the other hand, though, a stream of videos on Youtube such as Sh*t Girls Say and Sh*t Sorority Girls Say paint women in a negative light, and yet these videos have had millions of views. Women have had to face countless obstacles throughout history of gaining power and status in society, and it is because of women such as Oprah that the status of women in today's society is what it is. Why, then, after all of this hard work are there still aspects of society that bring down the status of women? The Sh*t __ Says phenomenon on Youtube makes degrading blanket statements about women, and yet these videos have millions of views. In a time when women should be empowered, these types of videos don't put women in a positive light. There is no shortage of positive role models, women who are making wonderfully significant contributions to society, yet there are still aspects of society where that status of women can be elevated. The aim of this project is to highlight this disparity, to show that while videos like Sh*t Girls Say may seem funny, in reality these videos have a negative impact on the status of women.
The ability to repair large bone injuries in humans is very limited with the exception of the rib, where large (6-8”) defects can undergo repair. Previous studies have shown that the periosteum, a special connective tissue that surrounds bones, is necessary for damaged rib bone repair. For example, if a portion of rib is removed, including the surrounding periosteum, the animal fails to regenerate bone. Thus, it is hypothesized that the periosteum serves as a foundation for rib bone regrowth and could potentially harbor unique properties or stem cells that support extensive bone repair. Studying these characteristics could help identify the characteristics of this tissue, which may be helpful for improving bone repair in the clinic.

To test this hypothesis, a survival surgery procedure was developed. A mouse was subjected to anesthesia and operated on to remove a portion of a vertebral rib with its associated periosteum. The use of two forceps allows for easy removal of the periosteum by stripping it off the free rib piece all at once. The periosteum is then laterally grafted into a new location (nearby intercostal muscles) by making a lateral incision and laying the periosteum into the produced aperture. This allows the periosteum to potentially carry out its functions in a new environment that is not too different from its original location.

Based on preliminary experiments, if the periosteum is indeed what is responsible for new bone growth, calcium deposits should be observable in the periosteum autograft. This can be observed using Alizarin red staining to detect matrix mineralization and calcein to detect new calcium deposits via fluorescence imaging. The periosteum grafted in the intercostal muscles has been observed to contain small fragments of bone immediately upon removal from the rib, suggesting that these fragments could serve as substrates for new bone formation.

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To test this hypothesis, a survival surgery procedure was developed. A mouse was subjected to anesthesia and operated on to remove a portion of a vertebral rib with its associated periosteum. The use of two forceps allows for easy removal of the periosteum by stripping it off the free rib piece all at once. The periosteum is then laterally grafted into a new location (nearby intercostal muscles) by making a lateral incision and laying the periosteum into the produced aperture. This allows the periosteum to potentially carry out its functions in a new environment that is not too different from its original location.

Based on preliminary experiments, if the periosteum is indeed what is responsible for new bone growth, calcium deposits should be observable in the periosteum autograft. This can be observed using Alizarin red staining to detect matrix mineralization and calcein to detect new calcium deposits via fluorescence imaging. The periosteum grafted in the intercostal muscles has been observed to contain small fragments of bone immediately upon removal from the rib, suggesting that these fragments could serve as substrates for new bone formation.
reduction in K+ efflux as opposed to an increase in K+ uptake. During exercise ATP is converted into its lower energy form, known as AMP. AMP in turn activates AMP-activated protein kinase (AMPK) which has been found to lower K+ plasma levels. Using 5-aminoimidazole-4-carboxamide-1-beta-D-ribofuranoside (AICAR) and A-769662, chemicals that act like AMP to activate AMPK, we plan to test the hypothesis that K+ clearance from the ECF into the ICF is a result of a decreased release of K+ from the muscle. Rats have already been perfused and muscle samples have been harvested. Using these samples, I will analyze the content of Na,K-ATPase and of other potassium channel proteins via Western blotting techniques. I will then analyze the data statistically to determine whether muscle AICAR and A-769662 affect the K+ efflux out of the muscle and influx into the muscle.

Category: Life Sciences
Name(s): Jessica Kuo
Submission Type: Individual
Project Sponsor(s) and Collaborator(s):
Sergey Nuzhdin, Biological Sciences; Joseph Dunham, Biological Sciences; Maren Friesen, Biological Sciences
Format: Laboratory-based Research
Title: An Efficient Method for Sequencing Microbial Communities
Abstract:
Attempts to characterize microbes and to sequence their metagenomes are obstructed by the cost of sequencing as well as its capacity to detect low abundance bacteria. Hamady et al. (2008) designed barcodes within 16S rRNA PCR primers, allowing 286 samples to be sequenced simultaneously. However, the technology is limited as barcodes are linked to a single specific primer, which requires the synthesis of hundreds of barcoded primers to target a specific site in order to sequence hundreds of samples. Thus, it is costly to sequence across multiple loci in hundreds of samples as needed for community characterization. By ligating sample specific dogtags to the overhang of PCR products, our technology allows us to disconnect the linked issue associated with barcoded primers. This is accomplished through pooling same sample multiple loci PCR products to perform a double ligation event, of dogtags and Illumina adaptors, in a single simultaneous reaction. We designed and tested 16S primers and novel universal primers in vitro based on multi-species alignments for functional genes nifH, napA, and amoA, common in soil (Osborn, 2005). After Illumina sequencing, we expect the reads for each gene to reflect the proportions of bacteria in our microbial community as normalized by 16S. By analyzing results, we can determine the method’s ability to detect functional genes and utilize the method in real-life applications with soil. Within various microbiomes, we can characterize and estimate the relative abundance of specific functional genes.

Category: Life Sciences
Name(s): Kevin Le, Ellen Park
Submission Type: Group
Project Sponsor(s) and Collaborator(s):
Sean Curran, Molecular and Cell Biology, Davis School of Gerontology
Format: Laboratory-based Research
Title: Bioengineering a mechanism to override plasmid-based antibiotic resistance
Abstract:
Bacteria protect their genome and remove foreign DNA through a primitive immune-like system called clustered-regularly-interspaced-short-palindromic-repeats (CRISPR). Plasmids commonly used in molecular biology are mobile genetic elements that facilitate horizontal gene transfer in the wild and enable the spreading of antibiotic resistance genes.
between microorganisms. Plasmids contain unique DNA sequences that can be targeted by the CRISPR system. We exploited this system by engineering E. coli with an inducible mechanism of self-curing plasmid based antibiotic resistance. We synthesized a version of CRISPR encoding a spacer that matches the GFP DNA sequence. We tested the synthetic CRISPR array against E. coli harboring a tetO::GFP plasmid that confers ampicillin resistance. Activation of CRISPR-GFP destroys the GFP-containing plasmid restoring the bacterial host’s sensitivity to ampicillin. We will use the synthetic CRISPR system as a biological tool, combining it with the other BioBricks for use in applications that will impact health and medicine, biotechnology, molecular biology, and genetics.

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**Title:** Characterization of an evolutionarily conserved loop in the MCM helicase

**Name(s):** Hasan Abbas

**Submission Type:** Individual

**Project Sponsor(s) and Collaborator(s):**
Xiaojiang Chen, Dornsife College of Letters, Arts and Sciences; Ian Slaymaker, Dornsife College of Letters, Arts and Sciences

**Format:** Laboratory-based Research

**Abstract:**

DNA replication during S phase of the cell cycle must be processed by a carefully organized and faithfully sequential chain of events. Consequences of deregulation include cell death and cancer due to missegregation of chromosomes. The initial priming, known as licensing, of DNA for unwinding is done by the pre-replication complex (pre-RC) during G1. In Archaea, model systems for DNA replication, the pre-RC consists of the DNA binding complex ORC/Cdc6 and the helicase MCM. Structural examination reveals an evolutionarily conserved loop in the central channel of the protein. Using mutagenesis, this project examines the potential role of this loop in DNA binding.

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**Category:** Life Sciences

**Name(s):** Charles Capron

**Submission Type:** Individual

**Project Sponsor(s) and Collaborator(s):**
Scott Applebaum, Biology; Donal Manahan, Biology

**Format:** Laboratory-based Research

**Title:** Characterization of SNF amino acid transporter genes and their expression in adult tissues of Antarctic echinoderms: Progress towards revealing the function of epithelial/integumental amino acid uptake in marine invertebrates

**Abstract:**

Absorption of dissolved organic matter across the body wall from the seawater occurs in adult marine invertebrates, as well as developmental stages of most of these organisms. Despite a century of study, little progress has been made towards understanding the physiological contribution or mechanisms underlying this process. Recently our laboratory characterized three amino acid transporter genes in larvae of a temperate species of sea urchin. Here we have identified related genes in Antarctic echinoderms. Collectively, partial mRNA sequences of 11 putative amino acid transporters were isolated from Acodontaster hodgsoni, Diplasterias brucei, Odontaster meridonialis, Odontaster validus, Perknaster fuscus and Sterechinus neumayeri. Conserved domains clearly identify these genes as SNF members. Expression of these genes was detected throughout embryonic and larval development of two species with contrasting planktrophic and lecithotrophic developmental modes. In adults of all six species, the expression of these genes was frequently detected in tube feet and digestive tissues. Our results
suggest that the same genes underlie these processes in multiple embryos, larvae, and adults.

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Category: Life Sciences
Name(s): Bonnie Chen
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Nina Bradley, Department of Biokinesiology and Physical Therapy
Format: Laboratory-based Research
Title: Contributions of L-DOPA to Locomotor-Related Limb Movement During Embryogenesis

Abstract:
The purpose of our study is to determine whether L-DOPA administration during embryogenesis can increase the frequency of repetitive limb movements (RLMs). It is known that the basal ganglia of the forebrain controls central pattern generators (CPGs) in the spinal cord to produce repetitive limb movements (RLMs). Changes in the frequency and amplitude of RLMs may affect these areas of the brain, among others, and shape neuromuscular interactions that support postural and motor muscle development.

Chick embryos were used to study the effects of L-DOPA administration using a within-subject design. Embryos were prepared for electromyogram (EMG) recording of an ankle flexor (TA), ankle extensor (LEG) and knee extensor (FT) in the right leg. Two hours of control data were recorded, followed by one to two boluses of L-DOPA. EMG and video recording continued for approximately two additional hours.

Four animals (of 11) have been analyzed for changes in frequency and intensity of both RLM bursting as well as non-RLM bursting. Long, sustained tonic bursting appeared 3-5 minutes immediately following L-DOPA administration and lasted for approximately 40 minutes, during which there was little repetitive limb movement activity. After approximately 40 minutes, an increase in both burst amplitude and duration is detected. The ankle flexor (TA) was the most sensitive to L-DOPA administration, increasing tremendously in both integrated amplitude as well as burst frequency. It was noted that although the number of occurrences of RLMs increased after drug administration, the number of bursts that constituted each RLM did not change significantly.

Through a preliminary analysis of these animals, it seems the neural circuits that govern RLMs are sensitive to L-DOPA. Both the Central Pathway Generator (CPG) in the spinal cord controlled by the basal ganglia and motor-neurons have DOPA receptors that may be involved in the detected changes in muscle bursts.

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Category: Life Sciences
Name(s): Sean Lee
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Bill May, USC Associate Professor in Pediatrics, the Saban Research Institute/Children’s Hospital Los Angeles
Format: Laboratory-based Research
Title: Cooperative Transactivation by EWS/FLI and GLI 1 in Ewing Sarcoma

Abstract:
Ewing Sarcoma family of tumors describes a set of tumors that commonly affect bones and soft tissues. The etiology for these tumors is not entirely known, but there is a strong chromosomal basis. There is some type of chromosomal translocation, predominantly between 11 and 22, that leads to a chimeric transcription factor known as EWS/FLI. FLI is part of the ets binding domain, and EWS can bind with other elements in this domain to give rise to EWS/ets transcription factors. EWS/FLI has a network of targets that can be either...
enhanced or diminished; the most notable target is GLI 1, which is crucial in the Hedgehog signaling pathway. This pathway is responsible for growth and development and the malfunction of it can lead to other types of cancers. Preliminary data reveal that EWS/FLI and GLI work synergistically to deregulate gene expression and can ultimately lead to the onset of Ewing Sarcoma. The proposed research plan has two aims:

1) To determine the essential structural elements of EWS/FLI chimeric transcription factors through producing structural EF mutants and testing them via reporter assays.

2) To identify and test the critical binding sites of EWS/FLI through reporter gene assays.

Reporter gene assays will utilize NIH3T3 murine tissue cells and the A673 Ewing cell line in determining EWS/FLI activity. More specifically, the reporter gene assays will include a luciferase assay and a FuGene assay, both of which rely on principles of transient transfections, proper reporter-driver titrations, and spectrophotometric analysis to determine levels of gene expression. Through reporter gene assays, we can elucidate which components of EWS/FLI transcription factors are most active and at which targets they have most activity. This knowledge can help us better understand the cause and mechanism of Ewing Sarcoma, and subsequently, lead to new and effective treatments.

Category: Life Sciences
Name(s): Julia Lazzari-Dean
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Moh El-Naggar, Physics
Format: Laboratory-based Research
Title: Direct in vivo Observation of Microbially Synthesized Nanostructured Materials

Abstract:
While eukaryotes are generally limited to oxygen as an electron acceptor for their metabolic pathways, some prokaryotes, such as Shewanella species, can respire by reducing Mn/Fe oxides, NO$_3^-$/NO$_2^-$, U(VI), Cr(VI), and S$_2$O$_3^{2-}$ (J. K. Fredrickson et al., Nature Reviews Microbiology 6, 592, 2008; K. H. Nealson et al. International J. of General and Molecular Microbio. 81, 215, 2002). Certain strains of Shewanella (MR-1 and ANA-3) can reduce chalcogen compounds (S, Se, and/or Te containing) and process other elements, including arsenic, while precipitating nanostructures such as arsenic sulfide nanofibers. Similarities in the chemistry of sulfur, selenium, and tellurium, as well as knowledge about Shewanella’s tolerance of cadmium, suggest that this process could be modified to produce cadmium selenide and cadmium telluride. The goal of this project is to develop a thorough understanding of the process through which these structures are produced, with the hope that it can be used to biotically synthesize additional important chalcogenide semiconductors.

Diascopic, bright field, and fluorescence microscopy have been used to visualize the cultures as the fibers are produced. Analysis of this time lapse data yields average growth rates for the fibers at a variety of concentrations and temperatures. The relationship between temperature and fiber elongation increases our understanding of the nature of the elongation process. EMPA and EDS spectra taken of the nanofibers
reveal their chemical identity. The use of the fluorescent protein stain NanoOrange indicates that fibers contain no protein and that local cell density is not higher around fiber clusters. Together, the data suggest a biotically influenced mechanism of nucleation, with abiotic, Arrhenius-determined elongation.

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**Category:** Life Sciences  
**Name(s):** Nicole Kashani  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):**  
Mike Jakowec, Neurology  
**Format:** Laboratory-based Research  
**Title:** Experience-dependent Neurogenesis following Basal Ganglia Injury in the Parkinsonian Mouse Model  
**Abstract:**  
Parkinson’s disease is a neurodegenerative movement disorder characterized by the loss of striatal dopamine and neurons of the substantia nigra. The labs of Drs. Jakowec and Petzinger focus on the role of exercise following basal ganglia injury. The hypothesis for this study is to analyze the effect of exercise on neurogenesis following basal ganglia injury. Neurogenesis is the generation of newly proliferated neurons that migrate and integrate to different regions of the brain. Neurogenesis has been shown to increase in voluntary exercise, in an enriched environment, and following brain injury. Using the neurotoxin 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), we are able to study animals that model the symptoms of Parkinson’s disease. Following MPTP lesioning mice were subjected to high-intensity treadmill running. Our treatment groups are saline, saline and exercise, MPTP, and MPTP and exercise. At 2, 4 or 6 weeks exercise treatments were injected with 5-ethynyl-2’-deoxyuridine (EdU), a nucleoside analog of thymidine that’s incorporated into DNA during active DNA synthesis, then brains were harvested and cryopreserved the following day or 7 days later.

For this project my role is to section the frozen brains, perform immunohistochemistry and quantitate, using a fluorescent microscope, the amount of EdU positive cells. This project will include cell counts from three regions of the brain: subgranular zone of the dentate gyrus, dorsal striatum, and substantia nigra. As well as EdU staining, sections will also be co-stained for the neuronal lineage markers Nestin (to label neural stem cells), doublecortin (immature neurons) and NeuN (mature neurons). By co-labeling our sections with EdU and Nestin, doublecortin or NeuN we may also be able to show what the fate of these new cells may be.

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**Category:** Life Sciences  
**Name(s):** Vivek Shah  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):**  
Mike Jakowec, Neurology; Giselle Petzinger, Neurology; Ruth I Wood, Cell and Neurobiology  
**Format:** Laboratory-based Research  
**Title:** Experience-Dependent Neuroplasticity in Dopamine-Linked Models of Parkinson’s Disease and Aggression  
**Abstract:**  
Experience-Dependent neuroplasticity is the ability of the brain to rewire in response to stimuli including exercise or rewards. Changes can be modulated by: formation of new synapses (synaptogenesis) and change in synaptic transmission. This set of studies analyzes synaptogenesis and synaptic transmission in two experimental models (injured and normal brain) linked to changes in Dopamine handling. From these experiments, we expect to see changes in synapses formation due to certain stimuli.
To test the effects of exercise, the stimulus, on an injured brain, mice were lesioned with MPTP to cause a Dopamine-depleted, Parkinsonian state. Studies have suggested that exercise stimulates synapse formation in the injured brain, but the mechanisms are poorly understood. In order to better understand these mechanisms, level changes of proteins involved in synapse formation including PSD95, CaMKII, and Synaptophysin are examined using Western Blotting. Regions studied are Striatum, Cortex, and Hippocampus.

We also examine changes in synaptic transmission (i.e. Dopamine release) in the normal brain by stimulating aggression through forced steroid abuse. These rats are given the chance to fight as a reward, the stimulus, which causes alterations in the Mesolimbic (Dopaminergic) rewards pathway. Modulations in the Mesolimbic pathway is noted by changes in Tyrosine Hydroxylase (TH), a precursor to Dopamine, which is the predominant activator of the Mesolimbic system. Regions involved in this pathway that are tested are: Striatum, Accumbens, and Ventral Tagmental Area.

In the Parkinsonian model, protein level changes indicate increased synapse formation. In the steroid abuse model, providing a reward showed changes in Dopamine handling as noted by decreased TH. These studies indicate dramatic changes in proteins involved in neuroplasticity.

These studies are important, because they help identify protein alterations through experiences (exercise and testosterone abuse) that may serve as targets for developments of new therapeutics for brain disorders and aberrant behavior including Parkinson’s Disease, Alzheimer’s Disease, and drug addiction.

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Category: Life Sciences  
Name(s): Linda Peng  
Submission Type: Individual  
Project Sponsor(s) and Collaborator(s): Xuelin Wu, Biological Sciences  
Format: Laboratory-based Research  
Title: Genetic and Functional Analysis of CYCP2;1 in Arabidopsis  
Abstract:  
Carbohydrates are a universal energy source and play a significant role in the proliferation and development of higher plants. Elucidating the mechanisms of how carbohydrates regulate cell division in Arabidopsis thaliana will allow for a better understanding of how carbohydrate utilization affects growth in general. The STIMPY gene has been shown to be necessary for proper growth and development of tissues, but the stimpy mutant can be rescued by adding sugar, which allows for the plant to grow normally. During the studies of this sugar rescue effect, we have found another gene, Cyclin P2;1, which is up-regulated in the stimpy mutant and down-regulated by sugar treatment. Sugar response experiments comparing the wild-type Col-0, single mutants of cycp2;1 and stimpy, and the double mutant confirmed that the double mutants and single mutants responded differently to different levels of sugar. Additionally, different phenotypes were visualized for plants containing an over-expression of CYCP2;1 of Arabidopsis and silencing of CYCP2;1. In the over-expression lines of CYCP2;1, there was an increase in sensitivity to high concentrations of sugar. Loss of CYCP2;1 expression due to gene silencing resulted in a majority of growth-arrested seedlings. In order to further elucidate the mechanisms of these differences in sugar sensitivity, we used the Yeast Two-Hybrid System to test possible interactions between CYCP2;1 and 12 cyclin-dependent kinases, based on the result of a pervious paper. We found that these CDKs either did not or interacted very minimally with CYCP2;1, indicating a...
different mechanism for control of sugar sensitivity. The results indicate that CYCP2;1 plays a role in carbohydrate utilization regulating cell division in Arabidopsis although the exact mechanisms have not been determined.

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Category: Life Sciences
Name(s): Barsegh Barseghian, Mary Boyadjian
Submission Type: Group
Project Sponsor(s) and Collaborator(s):
Rayudu Gopalakrishna, Cell & Neurobiology, Keck School of Medicine
Format: Laboratory-based Research
Title: Green Tea Polyphenols
Preconditioning against Ischemic Stroke

Abstract:
Stroke is one of the leading causes of death in the USA. Development of drugs against stroke poses many challenges, especially in regards to side effects of the drugs and innovative research. The research we are employing focuses on implementing an ethnobotanic method of neuroprotection from ischemic stroke. Our research focuses on the neuroprotective properties of green tea polyphenols (GTTP), especially epigallocatechin-3-gallate (EGCG). In order to measure the neuroprotective effects, we used an in vitro oxygen-glucose deprivation (OGD)/re-oxygenation model on rat pheochromocytoma (PC12) cells. To measure the efficacy of EGCG’s neuroprotective properties, a lactate dehydrogenase (LDH) cell viability assay will be used. Before conducting the LDH assay PC12 cells were preconditioned with GTTP/EGCG 48 hours prior to OGD/re-oxygenation. Using the LSH assay, we were able to show that preconditioning PC12 cells protected it against cell injury and death. Our experimental results have shown that GTTP are effective in preconditioning cells against oxygen-glucose deprivation. We used in vitro studies to confirm the ethnobotanic neuroprotection of EGCG from the debilitating and detrimental effects of stroke. It is important to note that our results measuring the efficacy of GTTP/EGCG were done using cell cultures and varies assays and in order to truly elucidate the interaction of the various neurons involved in stroke and the changes in the blood-brain barrier that are affected by stroke can be better determined via animal testing in preclinical and clinical studies. Thus, preconditioning and protecting cells from stroke in vitro are not quite conclusive until preclinical and clinical studies are performed. From our in vitro testing we have established the advantages in the natural protect of green tea and in the near future, we can safely test the effects of GTTP in green tea in humans, especially in high-risk populations.

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Category: Life Sciences
Name(s): Kelli Thompson
Submission Type: Individual
Project Sponsor(s) and Collaborator(s):
Nina Bradley, Biokinesiology and physical therapy; Anil Sindhurakar
Format: Laboratory-based Research
Title: Impact of light exposure during embryogenesis on development of ankle muscle activity during stepping in the chick embryo

Abstract:
The purpose of this study is to explore development of muscle activity for stepping in chick embryos. A previous study has indicated embryogenesis is shortened by exposure to continuous bright light or lengthened by exposure to continuous darkness. Additionally, recent results indicate control of alternating steps is accelerated by incubation in continuous light and delayed by incubation in continuous darkness. For this study, we hypothesize embryos incubated in continuous bright light will initiate
 alternating antagonistic activity in ankle muscles but embryos incubated in darkness for the same time span will not.

Fertile eggs were incubated in 1 of 3 light conditions from day 0 to 19: 24 hours/day of very bright light (24L), 12 hours/day of bright light (12L), or 24 hours/day of darkness (24D). Electromyography was recorded on day 19 from antagonistic ankle muscles in the right and left leg of 10 animals per condition. Results here report preliminary analyses for 5 animals per condition.

Sequences of repetitive alternating ankle muscle activity were most frequently observed in embryos incubated in 24L conditions: embryos produced 85 to 546 cycles per experiment. Similar alternating muscle activity was least frequently observed in embryos incubated in 24D conditions: embryos produced 7 to 70 cycles. Embryos incubated in 12L conditions produced 29 to 194 cycles. Also, extensor activity was more likely to symmetrically alternate with flexor activity (i.e., relative phase 0.4-0.6) during step cycles for embryos incubated in 24L, representing 39% to 64% of cycles per embryo. This symmetric pattern of alternating activity was rare during step cycles for embryos incubated in 24D, representing only 11% to 47%. Symmetric alternation was observed in 17% to 53% of cycles for embryos incubated in 12L.

Results thus far support our hypothesis and suggest light conditions during embryogenesis can impact development of intralimb stepping for locomotor control.

Category: Life Sciences  
Name(s): Jay Porterfield  
Submission Type: Individual  
Project Sponsor(s) and Collaborator(s): Nina Bradley, Division of Biokinesiology & Physical Therapy at the Ostrow School of Dentistry  
Format: Laboratory-based Research  
Title: Impact of Light on Veering during Over Ground Walking in Hatchlings  

Abstract:

The goal of this study was to further explore if variability in path trajectory during locomotion varied as a result of light exposure during embryogenesis. A straight path was defined as a 90° step trajectory from symmetric stance. We predicted that angular variation (veering) from a straight path would be greatest in chicks incubated in continuous darkness, because a previous study found that this group exhibited the greatest step width during locomotion, suggesting they had less optimal postural control.

In this study, we performed new analyses of published kinematic data examining locomotor performance in chicks incubated under 3 light conditions: continuous bright light (24L), cycled light 12 hr on/off (12L), and constant darkness (24D). Hatchlings (N=30, 10 per condition) were trained to walk along a Plexiglas® surface prior to video recording of walk trials during 2 sessions (4 walk trials per session) within 24 hours after hatching. The video recordings were digitized to obtain 2D coordinates which were used to calculate foot placement angles for consecutive steps using a MATLAB® function developed in the laboratory. Calculations were verified by protractor measurements prior to performing statistical tests (t-tests, α=0.05). Statistical analyses revealed that there were no significant differences between veering angles computed by the MATLAB® function and protractor measurements.

Preliminary analyses suggest that veering is
greatest in chicks incubated in the 24D condition: average veering from a straight path ranged 6.46°-15.55°. Further, angles were least in chicks incubated in the 24L condition: average veering angles ranged from 4.34°-8.63°. In conclusion, preliminary results suggest that light during embryogenesis may accelerate development of dynamic postural control for precocious locomotion. Our results may have implications regarding development of vestibular function.

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**Category:** Life Sciences  
**Name(s):** Brooke Sanders  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):** John Carmichael, Pituitary Center, Cedars Sinai Medical Center, Los Angeles; Albert Herrera, Biological Sciences  
**Format:** Analytical Paper  
**Title:** Intra-articular Glucocorticoid Injections as a Cause for Adrenal Insufficiency  

**Abstract:**
Background: Intra-articular steroid injections (IASI) can be associated with decreased release of endogenous cortisol, but are rarely thought to cause adrenal insufficiency (AI). We present five patients who presented to our center with AI, secondary to IASI.

Clinical Cases: Five patients (3F/2M, age range: 39-70 yrs) presented with fatigue, lethargy, shortness of breath, truncal obesity, and headaches. All five had a recent history of IASI for various indications. Initial Cortrosyn stimulation tests revealed insufficient responses: (mean baseline cortisol 0.6 ± 0.738 mcg/dL; mean peak cortisol 6.76 ± 3.74 mcg/dL.) Patients each received average 3.8 injections (range: 2-6) of triamcinolone acetonide. All five patients were diagnosed with AI secondary to suppression of the hypothalamic-pituitary-adrenal (HPA) axis and treated with hydrocortisone replacement therapy. Follow-up Cortrosyn stimulation tests were performed to assess for return of HPA axis function (peak cortisol >18 mcg/dL.) The median (±SD) time to recovery was 16 ± 38 wks (range: 6-88 wks). None of the patients in this series reported receiving IASI until directly asked. None knew the contents of the injections. All were seen and evaluated for presenting complaints by 2 or more physicians prior to diagnosis.

Discussion: While IASI are a well known cause of HPA axis suppression, they are not recognized as commonly causing AI. As illustrated in our series, patients often do not recall receiving IASI and do not consider them part of their current medical regimen. Patients rarely develop cushingoid features, further obscuring the etiology of AI. Severity of cushingoid features, extent of suppression, and time to recovery of the HPA axis varies among individuals. There is great variability in physiologic response to steroid injections due to glucocorticoid receptor (GR) polymorphisms, epigenetics, and interactions with other prescription drugs. Well-known factors such as dose, duration of treatment, and drug half-life also contribute to varying responses.

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**Category:** Life Sciences  
**Name(s):** Edward Chau, Jenna Elkington  
**Submission Type:** Group  
**Project Sponsor(s) and Collaborator(s):** Mike Jakowec, Department of Neurology; Giselle Petzinger, Department of Neurology; John Walsh, Department of Gerontology  
**Format:** Laboratory-based Research  
**Title:** Local translation of glutamatergic transcripts in MPTP mouse model of Parkinson's disease  

**Abstract:**
Parkinson’s disease is a neurodegenerative movement disorder that involves the loss of
striatal dopamine and neurons of the substantia nigra. The role of intensive exercise following basal ganglia injury is the focus of research in the laboratories of Drs. Jakowec and Petzinger. Using the neurotoxin 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), we are able to conduct studies on an animal model of Parkinson’s disease and better understand the underlying molecular role that exercise plays on dopaminergic and glutamatergic synaptic neurotransmission. One mechanism of the alternations in this system is possibly through local protein synthesis, which is the process by which mRNAs are transported to synapses and locally translated in response to neuronal synaptic stimulation, providing a mechanism by which gene expression can be regulated by individual synapses. To investigate local protein synthesis, comparisons must be made between global neuronal levels and those at dendritic spines, so whole tissue and synaptoneurosome preps were analyzed via qRT-PCR. The gene transcripts GluA1, GluA2, D1 and D2 were studied under four different conditional groups: saline, saline and exercise, MPTP, and MPTP and exercise. Initial results revealed a robust increase in GluA1 expression with MPTP in synaptoneurosomes, which is indicative of LTP (activity-dependent), while GluA2 only showed a slight increase. Both GluA1 and GluA1 levels drop significantly in the MPTP and exercise condition, suggesting that exercise may play an important role by either increasing receptor or its recycling efficiencies. The project presents a major paradigm shift in understanding and treating PD since it examines aspects of experience-dependent neuroplasticity and the potentially important role of the post-synaptic sites on the striatal medium spiny neuron. Understanding these mechanisms will allow us to fine tune exercise parameters for patients at all stages of PD and possibly identify new therapeutic targets for treatment.

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Title: Long-term protein restriction cycles reduce IGF-1 and phosphorylated tau and affect behavioral performance in a triple transgenic Alzheimer’s (3xTg-AD) mouse model

Name(s): Tom Maxim

Project Sponsor(s) and Collaborator(s): Valter Longo, Davis School of Gerontology

Submission Type: Individual

Format: Laboratory-based Research

Category: Life Sciences

Abstract:

Dietary restriction (DR), the reduction of food intake, delays the aging process and prolongs the lifespan of organisms ranging from yeast to mammals. The effects of DR appear to be tied to a reduction in the activity of insulin/insulin-like growth factor-1 (IGF-1) signaling. While IGF-1 is useful for brain maintenance, reduction of IGF-1 signaling may slow down age-dependent memory impairment. The goal of this study was to examine how a diet deficient in essential amino acids would impact IGF-1 levels and Alzheimer-like pathology in 3xTg-AD mice. 3xTg-AD and wild-type mice were subjected to protein restriction cycles (PRC) as well as Novel Object Recognition (NOR) and Y-maze memory tests. Serum IGF-1 levels were measured by the Cohen lab, and immunohistochemistry was used to detect tau and β-amyloid pathology in the brain. Protein restriction significantly reduced serum IGF-1 levels in both wild-type and 3xTg-AD mice. 3xTg-AD mice treated with PRC displayed a significant reduction in phosphorylated tau levels when compared to an untreated control group. These two groups showed similar Aβ accumulation, indicating that Aβ build-up promotes tau phosphorylation in an IGF-1-dependent manner. PRC-treated mice also showed a trend of improved performance in the NOR and Y-maze memory tests. These results suggest that PRC can diminish the activity
of the IGF-1 pathway and may decrease behavioral deficits and Alzheimer-like neuropathology, supporting PRC as a promising intervention for Alzheimer’s disease.

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Category: Life Sciences
Name(s): Christine Sur, Laura Wang
Submission Type: Group
Project Sponsor(s) and Collaborator(s): David Ginsburg, Environmental Studies
Format: Field Research
Title: Monitoring seagrass density in a Marine Protected Area at Santa Catalina Island

Abstract:
Big Fisherman’s Cove at Santa Catalina Island is a listed Marine Protected Area (MPA) under the Marine Life Protection Act. It is a designated no take zone and provides habitat for numerous invertebrate and fish species. The seagrass Phyllospadix torreyi was measured over a period of six months with underwater transects using SCUBA techniques to count shoot density over 50 meters set at six chosen headings. This study aimed to gather baseline density data and to develop long term monitoring protocol for future data collection.

Over the study period, seagrass density was determined to have remained stable with relatively few changes in abundance. Each individual transect monitored did not show trending patterns regarding density. Data loggers were deployed to monitor light intensity and temperature in the Cove. Over a period of six months, we noticed a decreasing trend overall for both light intensity and temperature. Temperature decreased from 61.55°F in November to 57.28°F in March.

Additional monitoring should be continued to completely determine the health of this MPA and any changes to the seagrass community. Seagrasses are importance ecosystem indicators of water quality due to their dependence on clear waters and sufficient light. This study can provide a baseline of information to compare future data and changes. While overall there was no change during the six-month monitoring period, this may be due to seasonality, reproductive timing, or other biophysical factors. Continued research of this area is important because the seagrass community provides habitat for many fish and invertebrate species and lies in a heavily boat trafficked area that can help indicate ecosystem health for this MPA.

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Category: Life Sciences
Name(s): Peggy Weng
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Michael Gordon, USC Keck School of Medicine Department of Pathology; Michael Press, USC Keck School of Medicine Department of Pathology
Format: Laboratory-based Research
Title: MYST2 and ABCC3 Gene Amplification in the HER2 Breast Cancer Subtype

Abstract:
Amplification and over-expression of Human Epidermal Growth Factor Receptor Type 2 (HER2) characterizes the HER2 breast cancer subtype. Located on human chromosome 17, HER2 encodes a tyrosine kinase receptor which activates signal transduction pathways that lead to cellular proliferation. HER2 over-expression promotes excessive cellular growth in the presence of a minimal amount of growth factor. Although the HER2 subtype is associated with high recurrence and low survival rates, the discovery of HER2 led to the development of HER2 targeted therapies, e.g., lapatinib and trastuzumab, which improved clinical outcomes.

Heterogeneous amplification of MYST2 and ABCC3 within the HER2 subtype potentially
affects disease progression and treatment response. Located near HER2, MYST2 acetylates nucleosomal histone H4. MYST2 is amplified and over-expressed in a portion of HER2 positive breast cancers (Hu et al., 2009). Meanwhile, ABCC3 encodes a membrane transporter of various molecules including drugs. ABCC3 amplification and over-expression, which predominantly occurs in HER2 positive breast cancer cell lines and primary breast tumors, may drive taxane drug resistance (O’Brien et al., 2008).

We hypothesize that MYST2 amplification contributes to increased aggressiveness and tamoxifen resistance in a portion of HER2 positive breast cancers and ABCC3 amplification drives taxane drug resistance in a portion of HER2 positive breast cancers. Preliminary single nucleotide polymorphism (SNP) microarray data showed that MYST2 is amplified in 11 out of 18 HER2 positive breast cancer cell lines and that ABCC3 is amplified in 8 out of 18 HER2 positive breast cancer cell lines. I used Fluorescence in situ Hybridization and Silver in situ Hybridization (SISH) to quantify MYST2 and ABCC3 amplification or non-amplification in each of these breast cancer cell lines. We are currently using SISH to score MYST2 amplification and non-amplification in 900 breast tumors to test for an association of MYST2 amplification status with clinicopathological endpoints and treatment response.

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**Title:** Neural Circuitry of Auditory Perception in Songbirds

**Name(s):** Emily Burke

**Project Sponsor(s) and Collaborator(s):** Sarah Bottjer, Neuroscience

**Submission Type:** Individual

**Format:** Laboratory-based Research

**Category:** Life Sciences

**Abstract:**

The "motor theory of speech perception" suggests that the neural circuits for perceiving speech sounds rely in part on circuits that control production of those same sounds. If so, then damaging neural circuitry for vocal production will interfere with perception of vocal sounds. Rather than deafening birds, as in previous work, I am lesioning a specific brain region: RA, the cortical motor nucleus that projects into the brainstem and directly innervates vocal motor neurons. The hypothesis I am testing is that motor representations of vocalization in RA are used to help identify and differentiate the vocalizations that the zebra finch hears. If this is true, then destroying RA should disrupt the finch’s ability to perceptually differentiate between the vocalizations that it hears, because it cannot compare those perceptions to the motor patterns it would use to create the same sound.

For this experiment I exploit the birds’ capacity to distinguish the fundamental frequency of vocal calls. They demonstrate this ability by habituating to a synthetic call of one fundamental frequency, but responding to other synthetic calls with different fundamental frequencies. The basic design of my experiment is to test the ability of zebra finches to discriminate vocal sounds (synthetic calls) with different fundamental frequencies, then lesion the cortical brain region that controls vocal production (RA), and subsequently re-test the birds to see if their ability to perceptually discriminate different frequencies was impaired by the lesion. Despite the fact that auditory brain regions will not sustain any damage, my prediction is that damaging the circuit for vocal production will interfere with perception of vocal sounds. Such a result would provide strong support for the idea that perception and production of vocal sounds have a reciprocal relationship.
Pb$^{210}$ and Bioturbation in Sediments Underlying the Amazon River Plume

Abstract:
The Amazon River plume has a major impact on ocean chemistry and ocean sedimentation. River waters carry key nutrients that are important for oceanic plant growth and essential for a productive marine ecosystem. I have looked at a tracer of sedimentation in this region, radioactive isotope $^{210}$Pb, that is commonly used to determine the rates of sediment accumulation as well as the rates of surface sediment mixing, which is typically caused by large benthic organisms. As $^{210}$Pb is produced in the ocean through radioactive decay, it sticks onto sinking particles and it is effectively removed from the water column. This process results in a generally uniform amount of $^{210}$Pb in the surface sediment for all areas of similar water depths. $^{210}$Pb decays exponentially at the rate dictated by its half-life of 22 years. Under the Amazon River plume, sedimentation rates are very low (~3-10cm/1000yr), so there should not be much $^{210}$Pb in the sediments below one centimeter. However, where sediments are mixed by large organisms, we will observe excess $^{210}$Pb at depth in the sediments. Db, the bioturbation coefficient, can be extracted from a graph of excess $^{210}$Pb. Db describes how fast or slow mixing is occurring in a particular area, assuming that mixing is essentially a diffusive process. The integral of the exponential decay curves of $^{210}$Pb give us the amount of excess $^{210}$Pb, or the inventory (I), that is present at a particular station. Using all of this information we can develop a clearer picture of the benthic processes that are occurring in this region, and look at how they relate to the amount of carbon reaching the sea floor.

Role of AMPA receptor in Parkinson's Disease recovery with exercise

Abstract:
Parkinson's Disease is a neurodegenerative disorder resulting from dopaminergic cell loss in the substantia nigra projecting to the medium spiny neurons of the striatum. These neurons participate in either of two pathways important for movement. Cells of the direct pathway, often referred to as the "accelerator", have D1 dopamine receptors; whereas cells of the indirect pathway, or the "brake", have D2 dopamine receptors. This variability of receptor type allows for dopamine to have opposite modulatory effects depending on the pathway, allowing dopamine to have an overall facilitatory effect on movement. Due to the loss of dopaminergic input in PD, however, there is hyperexcitability in the indirect pathway, and it becomes increasingly harder to initiate movement as the disease progresses. Our laboratory studies a Parkinsonian mouse model using the neurotoxin MPTP, which mimics the specific cell loss seen in PD, and, not surprisingly, we observe a motor deficit in these mice. After running the mice on a treadmill for an hour each day for 30 days, we do see a return to normal motor functioning, remarkably, without an increase of dopamine expression. It is therefore probable that this recovery occurs within the site of the synapse. Since the striatal neurons are driven by excitatory glutamatergic input from the cortex, and
only modulated by dopamine, I have been focusing on the glutamate receptor AMPA and its relation to PD recovery. The AMPA receptor is composed of subunits with differing properties: the GluA1 subunit promotes long term potentiation and strengthening of the synapses, while GluA2 allows for more receptor cycling and long term depression. As Parkinson’s results in excessive hyperexcitability and LTP, while exercise reduces this excitability and allows for a return of LTD, I hypothesize an increase in the GluA2: GluA1 ratio in the AMPA receptors of the indirect pathway.

Title: Role of Bone Morphogenetic Proteins in Promoting Metastasis of Breast Cancer Cells to the Brain

Name(s): Sarah Waliany

Project Sponsor(s) and Collaborator(s): Rahul Jandial, Department of Biological Sciences

Submission Type: Individual

Format: Laboratory-based Research

Abstract:

About 10-30% of breast cancer patients develop secondary brain metastases, and patients with brain metastasis have a dismal 20% probability of surviving more than 1 year. Bone morphogenetic proteins (BMPs), including BMP-2, have been shown to promote the motility and invasiveness of breast cancer cells, allowing them to metastasize to sites outside the breast, such as the bone. We hypothesize that breast to brain metastases are comprised of BMP-2 overexpressing cells which alter the brain’s microenvironment to allow colonization.

The objective was to determine the differences between primary breast tumor cells and breast tumor cells metastatic to the brain in terms of the following factors: relative gene expression of BMPs, BMP protein expression, and expression of phospho-SMAD proteins involved in the SMAD signaling pathway activated by BMPs. We also studied the effect of BMP-2 on breast cancer cell growth. Real Time-Polymerase Chain Reaction (RT-PCR) and western analysis were used to measure the gene and protein expression, respectively, of BMPs and phospho-SMAD in primary breast cancer cells and in breast cancer cells metastatic to the brain. A 66-hour cell count was also performed to measure and compare the growth of the cell lines.

The results showed that metastatic breast tumor cells had greater BMP-2 gene and protein expression and faster growth rate than primary breast tumor cells. Primary tumor cells transfected with BMP-2 also had higher protein expression of BMP-2, BMP-4, and phospho-SMAD and greater cell growth than the original primary cells.

The data indicates that breast tumor cells that are metastatic to the brain have greater BMP-2 gene expression and protein expression than do non-metastatic primary breast tumor cells. Furthermore, BMP-2 overexpression promotes the growth of breast cancer cells. This indicates that BMP-2 may play a role in allowing breast tumor cells to colonize, grow, and survive the brain.

Title: Structural Neuroanatomy of Lesioned Regions in Stroke Patients Correlate with Functional Activation of the Mirror Neuron System

Name(s): Pavitra Krishnamani

Project Sponsor(s) and Collaborator(s): Lisa Aziz-Zadeh, Occupational Therapy; Sook-Lei Liew, Occupational Therapy

Submission Type: Individual

Format: Laboratory-based Research

Abstract:

The mirror-neuron system (MNS) is a network of neurons located in different motor parts of the brain that are usually
active when we perform actions, but are also active when watching or hearing actions. Presumably, this occurs because we “replay” the action in our heads, further understanding how it works and coding to imagine performing the action, ourselves. The MNS has been hypothesized to be essential to our understanding of what is socially appropriate and what is not and has been implicated in many imitative behaviors that human infants show. Much of the research in cognitive neuroscience suggests that we use sensorimotor representations, like those in the MNS, to understand familiar actions, and reserve higher-level reasoning regions for understanding unfamiliar actions.

This study presents findings from 12 participants with chronic stroke resulting in moderate to severe hemiplegia and 12 age-matched non-disabled participants as they observe actions performed by both limbs. Patients were scanned while watching videos of actions they could perform (unaffected limb actions) and could not perform (hemiplegic limb actions). The scans were manually traced using BrainVox, a multimodal visualization and analysis system for neuroanatomical imaging.

Each MRI slice was traced for total brain volume, so that a three-dimensional rendering of the brain could be constructed. Brain areas irrelevant to the study were traced out. Ventricles and lesions were traced as regions of interest, and lesions were traced in two parts – cavitation, where there was a lack of brain matter, and broad, which encompassed surrounding damaged tissue as well. BrainVox calculated the total brain volume and those of the regions of interest, finding the percentage of the brain that was affected.

These lesion volumes and ventricular volumes demonstrated correlations with the functional activation of the MNS using fMRI when patients watched videos of the impossible (hemiplegic limb) action.

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Title: Synthesis of theta-Defensins, Cyclic Microbicides and Immunomodulatory Peptides

Name(s): Tito Thomas

Project Sponsor(s) and Collaborator(s): Michael Selsted, Department of Pathology

Submission Type: Individual

Category: Life Sciences

Format: Laboratory-based Research

Abstract:

Defensins are microbicidal peptides that are characterized based on their genes and their tri-disulfide motifs. θ-Defensins are cyclic 18-amino acid peptides formed by the post-translational ligation of precursors and are only found in Old World monkeys. Rhesus θ-defensins (RTDs) contribute to the majority of the antimicrobial activities of primate neutrophils. Using RTD-1 as a template, we designed six 14-amino acid analogs (μRTD-1-27, μRTD-1-28, μRTD-1-29, μRTD-2-36, μRTD-2-37, and μRTD-5-38) with two disulfide bonds and three 10-amino acid analogs (μRTD-1-272, μRTD-1-282, μRTD-1-292) containing a single disulfide bond. All RTD analogs were synthesized, folded and oxidized to form the disulfide bonds, and will be cyclized. Crude/linear peptides were dissolved in 10%AcN, 1%HOAc, 0.1%TFA and heated to 55°C with stirring. Disulfide bonds were formed by air oxidation at pH 8.4. Folding as a function of disulfide formation was confirmed by an increase in 280nm absorbance on RP-HPLC and a decrease of two atomic mass units using matrix-assisted laser desorption/ionization mass spectroscopy (MALDI-MS). To facilitate rapid purification with higher capacity for our desired peptides, small-scale cation exchange purification was performed using BioRad Macro-Prep CM resin equilibrated with 50mM sodium phosphate, pH 6.0, containing 5% acetonitrile (AcN). Folded peptide in 100μl aliquots was bound to
0.5ml of resin, washed with 1ml of NaH2PO4 buffer containing 20%AcN followed by 1ml of 2mM HCl and 20%AcN to remove scavengers used during peptide synthesis. Bound peptide was eluted with 0.5ml of 0.2M HCl 20%AcN. Recovery of folded peptides was 95-99% for μRTD-1-28, μRTD-1-29, μRTD-2-36, μRTD-2-37, μRTD-5-38 but the recovery of mRTD-1-27 was only 73%. However, no mRTD-1-27 was detectable in the flowthrough and washes suggesting that the lower recovery may have been due to an incorrect amount of peptide used for cation exchange or that the peptide binds nonspecifically to plastic or other surfaces used during the purification procedure.

Category: Life Sciences
Name(s): Tiffany Chen, Edward Park
Submission Type: Group
Project Sponsor(s) and Collaborator(s): Beth Pineles, Keck School of Medicine; Jonathan Samet, Preventive Medicine
Format: Field Research
Title: Systematic Review and Meta Analysis on Tobacco and Pregnancy

Abstract:
Smoking during pregnancy is an undisputed cause of low birthweight, but the evidence is unclear for rarer but more extreme pregnancy outcomes like stillbirth. Between 5 and 35% of pregnant women in each state smoke (14% nationally), and many more are exposed to secondhand smoke. We conducted a systematic review and meta-analysis to combine articles of the association of active and passive smoking with pregnancy loss, gaining precision over individual articles by increasing the number of pregnancies in the analysis. Two reviewers each searched the electronic database Pubmed using broad keywords relating to smoking and pregnancy and covering the dates 1965-August 2011. Titles, abstracts, and full texts of articles were reviewed in duplicate for selection of original articles for inclusion in the meta-analysis and of relevant review articles. References from all selected original articles and relevant review articles were examined to identify other articles potentially eligible for inclusion. Data was abstracted from articles in duplicate, and included the numbers of subjects, measures of association, measures of variability, levels of smoke exposure, definitions of pregnancy loss, and covariates such as country, time period, study design, and population demographics (ages, races, marriage status). Any discrepancies between reviewers in article inclusion or abstracted data were discussed and consensus decisions made. Of 13,400 article titles reviewed, 1,093 were selected for full-text review based on the title and, if available, the abstract. We have identified 72 articles on miscarriage, 92 articles on stillbirth, 48 articles on perinatal death, and 34 articles on neonatal death among 206 included articles. Approximately 10% of the articles on miscarriage and 2.5% of the articles on stillbirth addressed secondhand smoking. Data abstraction and analyses are ongoing, and preliminary results will be presented at the Symposium.

Category: Life Sciences
Name(s): Derek Asserson
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): John Tower, Biological Sciences
Format: Laboratory-based Research
Title: The Correlation Between Aging in Drosophila melanogaster and the Expression of Heat Shock Protein Genes with Green Fluorescent Protein Reporters

Abstract:
The fruit fly, Drosophila melanogaster, is commonly used in the laboratory to study aging mechanisms due to its strong biological relationship to humans. Stress levels are regulated by heat shock protein
(hsp) genes, and in this study, hsp22 and hsp70 are of particular interest. In order to quantitatively measure their expression, constructs are created in which the genes are tagged with green fluorescent protein (GFP) reporters. Utilizing sophisticated camera software that records four-minute videos and subsequent computer programming that analyzes a multitude of factors, a fly's fluorescence is transformed into numerical units. Therefore, fluorescence is hypothesized to be a predictor of lifespan. The first part of the study attempts to discover a correlation between the onset of hsp gene expression and lifespan. More specifically, it is believed that a negative correlation exists, as per regression statistics. That is, if a fly expresses a large amount of an hsp gene at an early stage in its life, namely after thirty days, which is when expression tends to begin, then it will die sooner. The second part of the study sets out to find a correlation between the change in hsp gene expression over time and lifespan. It is thought that a more drastic change, with the first video assay made at about day thirty and ones made every seven days for the following three weeks, will result in an earlier death than if expression takes place more gradually. The results seemingly begin to show the presence of such connections and a future study will seek to make them stronger. Overall, this study is paramount in understanding the role that hsp gene expression plays over the course of a fly's lifetime.

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**Title:** The Effects of Exercise on Neurogenesis in the SVZ and RCMS in the MPTP Mouse Model

**Name(s):** Brian Leyshon

**Submission Type:** Individual

**Project Sponsor(s) and Collaborator(s):**
Mike Jakowec, Neurology; Eve Kelland, Neurology; Giselle Petzinger, Neurology

**Format:** Laboratory-based Research

**Category:** Life Sciences

**Abstract:**

Neurogenesis is the primary mechanism by which new cells arise in the brain. This study aims to examine the effects of exercise upon neurogenesis, or proliferation of neural stem cells, in the MPTP mouse model. In mammals, neurogenesis is primarily restricted to two areas of the brain, the hippocampus and the subventricular zone (SVZ). From the SVZ, nascent cells migrate to the olfactory bulb through the rostral caudal migratory stream (RCMS), where they have a role in olfaction. Learning more about the nature of adult neurogenesis has a variety of implications, particularly in treating neurodegenerative diseases. As such, the MPTP lesioned mouse, an animal model for Parkinson's Disease, was selected as the experimental model. Four experimental groups were used: sedentary and exercised mice given a sham saline injection, and sedentary and exercised mice given an MPTP injection. Brain tissue was processed using immunohistochemistry; proliferating cells were identified using EdU. Counts demonstrated a nonsignificant trend towards increased neurogenesis in exercise groups compared to controls. Specimens harvested five days after EdU injection showed significantly less EdU positive cells than their cohorts harvested immediately after EdU injection, suggesting that a large portion of newly proliferated cells in the brain die soon after division. The consequences of neurogenesis can be better elucidated by tracking the development of newly proliferated cells; thus the next portions of the experiment...
will be devoted to IHC with GFAP, Nestin, and Doublecortin co-labeling in conjunction with EdU labeling.

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Category: Life Sciences  
Name(s): Tammy Bui  
Submission Type: Individual  
Project Sponsor(s) and Collaborator(s): Hank Cheng, Department of Biological Sciences; Caleb Finch, Davis School of Gerontology  
Format: Laboratory-based Research  
Title: The Glial Conditioned Media Effect of TNFα on Neurite Outgrowth

Abstract:  
TNFα is a cytokine released by cells in response to injury to remove harmful stimuli, such as pathogens, damaged cells, and irritants. Prolong expression of these cytokines is deleterious to the host because it stimulates chronic inflammation that simultaneously destroys and heals tissue. Within the nervous system, TNFα contributes to neuroinflammation, neurotoxicity, and cerebrovasculare damage, which correlate with a reduction in neurite outgrowth and branching that is associated with aberrant brain development in young children. Fine nanoparticulate matter (nPM) (<2.5 μm) in urban air pollution, containing endotoxins and inflammatory factors, is strongly implicated in cardiovascular events that are commonly linked to cognitive decline and Alzheimer’s Disease. Our interest in studying nPM-induced TNFα expression in neurons is vested in its effect on neurite outgrowth and branching and, ultimately, in its potential role in contributing to neuropathology such as Alzheimer’s.

In this study, we hypothesized that ambient nPM from urban pollution causes reduced neurite outgrowth and number by inducing increased levels of TNFα expression.

We found 1) significant TNFα expression in rat neonatal microglia and astrocytes in nPM-treated conditioned media and 2) significant TNFα expression in rat neonatal microglia but non-significant TNFα expression in astrocytes in LPS-controlled conditioned media. Both conditioned media also revealed significant increase of TNFα expression in activated microglial conditioned media compared to astrocytes. nPM-treated and LPS-control conditioned media yielded increased levels of TNFα expression that correlated with reduced neurite outgrowth and branching. When TNFα siRNAs and antibodies were applied to the rat neonatal mixed glia, E18 neurons observed a rescue effect in reduced neurite outgrowth and branching.

Our findings suggest that nPM is a potent inducer of TNFα expression and reduced neurite outgrowth and branching. Secondly, it suggests that secretions from activated microglia into the conditioned media are the main contributors to reduced neurite outgrowth and branching.

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Category: Life Sciences  
Name(s): Zhuangjun Wang  
Submission Type: Individual  
Project Sponsor(s) and Collaborator(s): Irving Biederman, Psychology/Neuroscience  
Format: Laboratory-based Research  
Title: The Neural Basis of the Joy of Humor and Insight

Abstract:  
There is a series of stages in the cortex by which visual shape information progressively gets transformed from an early stage in the occipital cortex, where cells respond to small bits of contour, to a final stage where a rich interpretation of a scene is achieved. Somewhat surprising, there is a gradient of opioid receptors in this pathway which are sparse in the early stages and increasing in density in the later stages leading into and including associative cortex. (A similar gradient is
What is the function of this gradient? Biederman and Vessel (2006) theorized that people (and primates) are designed to maximize the rate of opioid activity, which yields pleasure. High activity could be achieved simply by a high degree of associative activity in later stages. The propensity for this activity leads to people becoming infovores, always seeking new but interpretable experiences. Support for this view derived from fMRI studies where higher activity was recording in opioid dense areas when people viewed scenes that they found engaging, compared with scenes that were less interesting. Perceptual pleasure is decreased under naloxone, a drug that is an antagonist for opioids. The current study explores the neural correlates of humor and the joy of insight. In the scanner, subjects are shown doodles, simple line drawings which are nonsensical until presented with a description which gives the viewer a highly humorous, concrete interpretation. To distinguish the neural activity associated with humor and problem solving, subjects also view novel patterns that defy interpretation until a verbal phrase is supplied. In both cases, the neural activity attendant upon a humorous or insightful interpretation will be contrasted with the activity from a description that just describes the shape of the image.

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**Title:** The Role of Negatively Charged Lipids in Diabetic Amyloid Cytotoxicity

**Name(s):** Chenura Jayewickreme

**Submission Type:** Individual

**Project Sponsor(s) and Collaborator(s):**
Robert Chow, Physiology and Biophysics, Zilkha Neurogenetics Institute, Keck School of Medicine; Ralf Langen, Biochemistry and Molecular Biology, Zilkha Neurogenetics Institute, Keck School of Medicine; Alan Okada, Physiology and Biophysics, Zilkha Neurogenetics Institute

**Format:** Laboratory-based Research

**Category:** Life Sciences

**Abstract:**
Diabetes mellitus (DM) is an acute medical disorder in which the body fails to regulate blood glucose levels and that when left untreated, leads to the failure of multiple organ systems. DM is a global epidemic with 25.8 million diagnosed cases in the United States and over 79 million Americans classified as pre-diabetic. Type 2 DM is characterized by two key defects: (a) β-cell impairment and death and (b) insulin resistance. The mis-folding of Islet Amyloid Polypeptide (IAPP), a peptide co-release with insulin, is hypothesized to drive β-cell death. Therefore, we investigated whether negatively charged lipid plasma membrane (PM) components such as phosphatidylyserine (PS) and gangliosides (GMs) accelerate IAPP misfolding and aggregation.

INS-1, a β-cell model from Insulinoma was the platform for the study. N-Acetic-Neuraminic Acid (NA) cleaves sialo groups, the negatively charged moiety on GMs, leaving behind asialo or monosialo (GM1) gangliosides. Cells treated for one hour with NA showed increased Cholera Toxin, a known GM1 antibody, labeling. This confirms reduction of GMs and surface charge by NA.

Prior work has shown that PS moves from
the inner leaflet of the PM to the outer leaflet during membrane hyper-stimulation. Labeling of PS via an Annexin-B12 based label following stimulation (80 mM KCl) confirmed PS exposure on INS-1 cells.

Human IAPP was labeled with a fluorescent IANBD ester, which does not affect membrane interaction. A gravity driven perfusion system and pulled glass pipets were used to deliver solutions (2 uM IAPP-IANBD in control or stimulatory external solution) directly onto cells. Time-lapse recording were made to capture the activity. Labeling was strongest for stimulated control (no NA) cells, which suggests interaction with PS and GMs. We plan to confirm co-localization of IAPP with PS and GMs Förster resonance energy transfer (FRET), a super-resolution microscopy technique. Elucidating the molecular mechanism of T2DM will aid in the development of effective therapeutics.
Title: A Microfluidic Platform for Focal Stimulation
Name(s): Aye Thu
Project Sponsor(s) and Collaborator(s): Ellis Meng, Biomedical Engineering Department, Viterbi School of Engineering
Submission Type: Individual
Category: Physical Sciences & Engineering
Format: Laboratory-based Research
Abstract:
Biological systems communicate via exchange of both electrical and chemical signals. Chemical gradients formed in cell signaling, nutrient uptake, waste disposal, and gas exchange influence cell functions. The conventional method of bulk fluid flow delivery by hand-pipetting or other forms of perfusion can only stimulate a large cell population. Focal delivery of chemicals at cellular and sub-cellular resolution enables the understanding of biological responses of cells and tissues and provides a means of interfacing with the nervous system beyond electrical stimulation. The microfluidic platform presented here allows for precise and repeatable modulations of targeted cell or small cell group within a population. Active polymer-based microfluidic systems previously fabricated in the lab were characterized with a flow rate of 1 μL/min. The flow out of the pore is characterized as a function of input flow to the microchannel by measuring the dimensions of a plume of a Rhodamine B solution ejected into water as a function of time.

Title: A Physiologically Based Computational Model of C-Peptide Secretion from Pancreatic Beta Cells
Name(s): Jennifer Rohrs
Project Sponsor(s) and Collaborator(s): David D’Argenio, USC Viterbi School of Engineering
Submission Type: Individual
Category: Physical Sciences & Engineering
Format: Laboratory-based Research
Title: A Physiologically Based Computational Model of C-Peptide Secretion from Pancreatic Beta Cells
Abstract:
Insulin, a hormone that helps control blood glucose levels, has impaired secretion characteristics in patients with type II diabetes mellitus (T2DM). The characteristics of this impairment are not well known. Our goal is to create a computational model, based on the physiological mechanism of insulin secretion, which can be used to analyze how secretion differs in healthy patients and those with T2DM.

Currently, models have been constructed to analyze plasma insulin levels; however, these models do not represent the secretion of insulin from the beta cells of the pancreas because, before it reaches the blood circulation, insulin is passed through the liver where much of it is metabolized. C-peptide is cleaved from pro-insulin during the production of insulin, and is at equimolar amounts compared to insulin. C-peptide is a small molecule and is not metabolized in the liver, so blood
concentration levels of C-peptide are representative of the amount secreted from the pancreas; therefore, we chose to model the secretion of insulin based on plasma C-peptide levels. We used experimental data from women with gestational diabetes, a form that is thought to be very similar to T2DM.

After we showed that the model previously used to describe plasma insulin levels did not accurately represent C-peptide secretion, we began hypothesizing a new model based on the physiological secretion mechanisms of beta cells. We used data from the literature to create several hypothesis models with two compartment (the central plasma compartment, and the peripheral tissue compartment) or three compartments (addition of a beta cell compartment). We expanded these models to account for a variety of vesicle pools and secretion mechanisms based on hypothesized mechanisms in the literature, and tried to fit the C-peptide experimental data.

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Name(s): Ana Victoria Flores, Brock Malinoski

Project Sponsor(s) and Collaborator(s): Travis J. Williams, Chemistry

Category: Physical Sciences & Engineering

Format: Laboratory-based Research

Title: Catalysis for Stored Hydrogen Release

Abstract:
Introduction: With recent technological advancements, energy consumption has shown an evident increase in 2011. A developing form of alternative energy is the use of hydrogen. However, because it exists as a gas at ambient temperatures, it has low energy density and some safety risks. Because of this, it is necessary to find solid or liquid hydrogen carriers that are suitable for use in vehicles. The Williams group develops catalysts for the dehydrogenation of ammonia borane (NH3BH3), a leading hydrogen storage material. Our predecessors synthesized a catalyst for the dehydrogenation of ammonia borane. Despite the success of the dual site, ruthenium, boron catalyst, mechanistic studies must be completed to fully optimize the system.

Aims: Through the use of spectroscopy and catalyst design we are currently making the next advancement in hydride manipulation. The current project is to create a tricarbonylated version of the existing ruthenium catalyst. We predict that this new catalyst will produce greater than 2.2 equivalents of hydrogen. We believe it will be better at catalyzing the borazine coupling to remove the third equivalent of hydrogen out of ammonia borane. We will also run a reaction with the new catalyst and formic acid and analyze its effects. It should dehydrogenate the formic acid to make H2 and CO2, with little CO and H2O byproducts. This may help us discover a new way of regenerating the ammonia borane spent fuel so that we can commercialize our complete hydrogen storage system. We would also like to explore various cheaper analogues of the Conley catalyst, by modifying it with a new ligand. We will attempt to synthesize dipyriddy methylsilane, a less expensive and less toxic compound. The goal of this is to make the Conley catalyst synthesis a less difficult and less expensive procedure so that it can be used commercially.

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Name(s): Shira Epstein

Project Sponsor(s) and Collaborator(s): John Choma, Viterbi School - Electrical Engineering

Category: Physical Sciences & Engineering

Format: Laboratory-based Research

Title: Circuit Optimization
Abstract:
Electronic circuits are increasingly integrated into modern daily life. Certain circuits are especially common, and can be seen as the building blocks to larger systems, with crucial functions such as amplification, buffering, and filtering. For each circuit topology, there exist a number of tunable parameters, such as the area of a transistor or resistivity of a resistor. These parameters must be adjusted for the circuit to operate as desired.

Typically, the problem is approached by hand. First a model is created to represent circuit behavior. The model consists of a set of equations, where each tunable parameter is a variable. If the solution to the system of equations is nontrivial, the model is simplified at the expense of accuracy. Simulation with tools such as SPICE are used to verify results.

In this project, we pose the circuit design problem as an optimization problem. The goal of an optimization problem is to minimize (or maximize) a function called the objective function. The objective function is chosen by the designer to reflect the desired circuit behavior. The feasible solutions are defined by the circuit model in SPICE and additional constraints specified by the designer. An optimization algorithm searches the space of feasible solutions for the best solution it can find, beginning at an initial guess vector also specified by the circuit designer. Over the course of this research project, we explored and analyzed the results of applying various optimization algorithms, objective functions, problem constraints, and initial guess vectors to our circuit design problem.

Title: Comparison of Solar Sub-Surface Flows During Solar Cycle 23: MDI and MWO
Name(s): Travis De Ronde, George Martin
Project Sponsor(s) and Collaborator(s): Stephen Pinkerton, Physics and Astronomy; Edward Rhodes, Physics and Astronomy
Submission Type: Group
Format: Laboratory-based Research
Abstract:
A primary goal of solar physics is to gain a better understanding of the underlying mechanisms of solar activity. By analyzing solar sub-surface flow patterns and their dependence and effect on solar magnetic activity, we can improve stellar models and better predict short and long-term solar activity trends. As sound waves move through the solar interior, they are Doppler shifted by sub-surface flows. Using dopplergrams recorded at the 60-foot Solar Tower at Mt. Wilson Observatory (MWO) at a cadence of 60 seconds, we produced two-dimensional power spectra, which appear as concentric circles or rings. Using these “ring diagrams” and a series of fitting and inversion procedures, the magnitude and direction of the sub-surface flow is determined for a particular date at discrete latitude and longitude coordinates. Synoptic flow maps showing the zonal (east-west) and meridional (north-south) flows at various depths beneath the sun’s surface are generated by averaging the flow over an entire Carrington Rotation (approximately 27 days). We have created synoptic maps for Carrington Rotations 1910, 1923, and 1948.

We have analyzed earth-based data from MWO and will compare our results to published results which were created using space-based data from the Michelson-Doppler Imager (MDI) on board SOHO. One of our main goals is to reaffirm the presence of a submerged circulation cell in the MDI data. MDI was operational from 1996-2011, but MWO has been recording
high-resolution dopplergrams since 1986, giving us a unique data set that has yet to be analysed. Comparing the results between MWO and MDI will help us to remove systematic errors from our data, which will allow us to move forward and analyze data recorded solely by MWO.

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Category: Physical Sciences & Engineering
Name(s): Audrey Harker
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Andrea Armani, Mork Family Department of Chemical Engineering; Mark Harrison, Ming Hsieh Department of Electrical Engineering
Format: Laboratory-based Research
Title: **Curved Silica-on-Silicon Integrated Waveguides**

Abstract:
Optical waveguides have great potential for improving integrated devices in a variety of fields, including telecommunications and biological sensing. To benefit these applications, waveguides must have two important qualities: 1) they should be able to efficiently direct light within a specific path and 2) must be easily fabricated for integration with other devices. The main fabrication method for a waveguide involves placing two materials next to each other that have different abilities to confine light. This difference in material properties allows for light confinement within the device. However, due to the fabrication process, most waveguides have considerable surface roughness, contributing to scattering and light loss. Recently, the Armani group has overcome this process with the development of a new integrated waveguide based on a suspended, T-shaped geometry. This device has been tested to yield ultra-low losses across a range of light wavelengths.

While our group has successfully developed these straight waveguides, integration with other devices is difficult due to the large amount of space they take up. To develop ultra-high density wiring, which minimizes cost and maximizes functionality and reliability, this project developed multiple curved waveguide geometries and tested the light leakage at different bend radii. Using lasers in our waveguide testing setup, light was focused into the waveguides. The output light was detected by our computers, which record the values. It was found that while some light traveled through the curved structures, geometries that had a total length greater than 5 mm had too many losses to detect output light. Current work focuses on data collection and analysis of geometries with a total length between 1-2 mm. In the future, this experimental data will be compared to theoretical computations that model light propagation through our curved devices.

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Category: Physical Sciences & Engineering
Name(s): Aaron Henehan
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Yu-Han Chang, Computer Science Department; Sam Danesis, Computer Science; Rajiv Maheswaran, Computer Science Department
Format: Analytical Paper
Title: **Deconstructing the Rebound with Optical Tracking Data**

Abstract:
This paper leverages STATS' SportsVu Optical Tracking data to deconstruct several previously hidden aspects of rebounding. We are able to move beyond the outcome of who got the rebound to discover the non-linear relationship between shot location and its impact on offensive rebound rates, implications of the height of where rebounds are obtained, and estimates of where players should move in order to improve rebounding rates. We also leverage machine-learning methods to estimate the predictability of rebounding.
**Category:** Physical Sciences & Engineering  
**Name(s):** Joahanna MacAranas  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):**  
Alejandra Avilés Valdez, Department of Chemistry; Barry Thompson, Department of Chemistry  
**Format:** Laboratory-based Research  
**Title:** Design of Conjugated Polymers for Ternary Blend Solar Cells  
**Abstract:**  
An ethanol-substituted precursor for the diketopyrrolopyrrole-based dye, trifluoromethylphenyl diketopyrrolopyrrole (TFPDPP), was synthesized. Subsequent coupling to the fullerene [6,6]-phenyl-C_{61} butyric carboxylic acid (PCBA) and characterization of this dyad is necessary to gain insight into how to best approach its later incorporation into a polymer-fullerene solar cell. The proposed system is composed of poly(3-hexylthiophene) (P3HT) as a donor and the new fullerene as the acceptor in a binary blend. Later work will focus on ternary blend analogues based on P3HT and the free dye as donors, along with [6,6]-phenyl-C_{61} butyric acid methyl ester (PCBM) as an acceptor. The relative importance of the energetic relationship between the three components is directly related to morphology and investigation towards the ideal composition will elucidate differences between simple mixtures and covalent attachments. In ternary blend BHJ solar cells, the dye component cannot only increase the spectral breadth of light absorption and thus $J_{sc}$ (short circuit current), but provide a means to tune $V_{oc}$ (open circuit voltage) through compositional control. The potential for simultaneous increase of both $J_{sc}$ and $V_{oc}$ corresponds to a higher $J_{sc} \times V_{oc}$ product and efficiency that can rival or surpass that of a binary blend with same constituent components.

In addition, thiophene-based monomers 3-hexylthiophene and 3-(oligoethylene oxide)-thiophene were synthesized with a two-carbon spacer separating the thiophene ring and the functional substituent to minimize impact on electronic properties. These two monomers, grouped with 3-semifluorohexylthiophene and 3-(hydroxyl-oligoethylene oxide)-thiophene, provide the basis for a new, family of homopolymers, random copolymers, and semi-random copolymers with a range of electronic structures and surface energies with which to explore the influences of morphology and electronic structure relationships in ternary blends. These monomers provide the necessary control over phase separation to achieve desired morphologies, by specific generation of donor polymers categorized as hydrophobic, hydrophilic, strongly hydrophobic, and strongly hydrophilic.

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**Category:** Physical Sciences & Engineering  
**Name(s):** Kamil Masood  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):**  
Somesh Ganesh, Department of Chemistry; John-Paul Jones, Department of Chemistry; Surya Prakash, Department of Chemistry  
**Format:** Laboratory-based Research  
**Title:** Difluoromethylation of Aryl and Styrenyl Halides using a Novel Organotin Reagent  
**Abstract:**  
Selective introduction of the difluoromethyl group (CF2H) into organic molecules is of great importance in organic chemistry due to the unique properties of the CF2H group. We report here the direct ipsodifluoromethylation of an aryl iodide or styrenyl halide using a novel organotin reagent via a copper (I) catalyst in moderate to excellent yields. We also propose a reasonable mechanism for the reaction
based on computational and experimental data using a solvent-stabilized CuCF2H species as an intermediate.

The rate of FA decomposition in the presence of authentic \([\text{Ru}_3(\text{CO})_6]^{+}\) and \([\text{H}_4\text{Ru}_4(\text{CO})_{12}]^{-}\) was measured using gas volumetric technique. We found a bell-shaped relationship between catalyst concentration and rate of formic acid decomposition in the temperature range explored (35-60°C). The optimal catalyst concentration remained almost constant through all temperatures.

No decomposition was observed in the absence of sodium formate, indicating that Ru formato carbonyls may be active intermediates. \(^1\text{H}\) NMR investigation of the reaction mixture revealed the formation of triruthenium and tetraruthenium hydrido carbonyls as active intermediates. On the basis of kinetic and spectroscopic measurements we suggest a reaction mechanism for the decomposition of FA involving a dissociative rate limiting step.

The goal of our research was to develop an active catalyst that is able to decompose FA giving hydrogen and carbon dioxide with high selectivity. Decomposition of FA in the presence of \(\text{RuCl}_3\) resulted in the formation of \([\text{H}_4\text{Ru}_4(\text{CO})_{12}]^{-}\) in high yield, indicating that this cluster complex is an active catalyst or its direct precursor. FTIR, \(^1\text{H}\), and \(^{13}\text{C}\) NMR measurements confirmed the presence of a tetrahedral Ru core with terminal carbonyl and bridging hydride ligands.

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and depth perception can also be restored with implantation of an intraocular camera that is connected to the microstimulator array to form an entirely intraocular retinal prosthesis.

Due to power restrictions and limitations on the number of connections, the resolution of the microstimulator array is severely limited (currently 6 × 10 “pixels”). In addition, due to its short focal length, the images created by an intraocular camera for retinal prostheses are relatively low-resolution images (designed to support a resolution of 32 × 32 in current models). Yet a subject implanted with monocular prosthetic vision can perform basic depth perception tasks such as recognizing and stepping over an approaching curb. We recently conducted experiments to show how subjects implanted with the intraocular camera for retinal prostheses can perceive depth monocularly even in the low resolution limit.

One key depth perception experiment asked sighted subjects to rate the depth they perceived in color images that were pixellated, as well as post-pixellation blurred, to various levels representing resolutions obtainable with the intraocular camera for retinal prostheses. The data suggests that monocular depth perception (due to pictorial depth cues) is possible in low-resolution images, and that depth is better perceived in blurred post-pixellation images than in pixellated-only images. Surprisingly, subjects perceived depth even at very low pixellation levels. We are currently developing, analyzing, and quantifying the results of further developed versions of this experiment, in particular with regard to optimal design of the single-eye intraocular camera for retinal prostheses. Pixellated and post-pixellation blurred motion videos are being studied to clarify the effects of pixellation on motion depth cues (such as motion parallax and optic flow).

## Title:
Multilayer Microlaser: An Alternative Fabrication Method for Er:Yb Microlasers

## Name(s):
Nishita Deka

## Project Sponsor(s) and Collaborator(s): Andrea Armani, Mork Family Department of Chemical Engineering and Materials Science

## Submission Type: Individual

## Format: Laboratory-based Research

## Category: Physical Sciences & Engineering

## Abstract:
Ultra-low threshold microlasers have applications in satellite communications, biodetection, and optical computing. In order to obtain ultra-low thresholds, the gain medium and the lasing cavity must be optimized. Whispering gallery mode resonators are an ideal cavity because of their high quality factors and small size. Currently, the Armani Lab is investigating a co-doped configuration using erbium (Er) and ytterbium (Yb), two rare-earth metals, as the gain medium. This configuration is preferred over a single element device because the secondary material acts as a sensitizer and increases the lasing efficiency of the primary dopant, improving the overall device performance.

The conventional process for fabricating Er:Yb microlasers begins with the synthesis of a co-doped sol-gel, consisting of Er and Yb in a liquid silica. The solution is applied to a wafer, and the microlaser is fabricated through lithography, etching, and a final CO2 laser-heating step, which melts the device. Because of the high concentration of Er and Yb, the sol-gel film often has micro-cracks, creating defects in the devices. Normally, only about 50% of the lasers on the substrate are usable, leaving significant room for improvement.

Here, a new fabrication method is being investigated in which single-dopant sol-gels
will be synthesized to reduce high concentrations of both Er and Yb in a single layer. The Er and Yb sol-gels will be alternately spin-coated onto the substrate, forming layered devices. The dopants will mix during the final CO2 laser reflow step of the fabrication, resulting in the same microlasers as before.

Er-doped and Yb-doped sol-gel toroids are currently undergoing tests. The multilayer structure will be fabricated once lasing is demonstrated with single-dopant devices. Ultimately, if this approach is successful, it will open the door for the development of tri-doped devices, which could lead to visible and UV-lasers.

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Category: Physical Sciences & Engineering
Name(s): Nancy Benner
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Thieo Hogen-Esch, Department of Chemistry; Janet Olsen, Department of Chemistry; Victoria Piunova, Department of Chemistry
Format: Laboratory-based Research
Title: New Synthetic Methods for Telechelic Functionalized Polymers

Abstract:
Telechelic functionalized polystyrene have been prepared with a recently developed strategy through an atom transfer radical polymerization (ATRP)-mediated end-capping reaction of a difunctionalized polystyrene and a sterically hindered monomer that can add only once. Sterically hindered phenyl ester monomers were prepared via Steglich esterification between 2-phenyl-acrylic acid and alcohols containing the desired functionalities. Bis-bromoisobutyryloxyethane (BBOE) was used to initiate difunctional polystyrene was prepared via ATRP using 1,2 in the presence of Cu(I) complexes. Subsequent ATRP-mediated end-capping (addition) of functionalized 2-phenylacrylate derivatives allowed these monomers to add only once, due to steric hindrance. The introduction of these functionalities in telechelic polymers may allow for unique photochemical, mechanical and other properties of the corresponding polymer.

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Category: Physical Sciences & Engineering
Name(s): Avril Pitter, Kirsten Rice, Kristen Sharer
Submission Type: Group
Project Sponsor(s) and Collaborator(s): Stephanie Olague, Sonny Astani Department of Civil and Environmental Engineering, Viterbi School of Engineering; Massoud Pirbazari, Sonny Astani Department of Civil and Environmental Engineering, Viterbi School of Engineering; Varadarjan Ravindran, Sonny
Format: Laboratory-based Research
Title: Optimization of Biodiesel Production from Algae through Ultrasonication Extraction Method

Abstract:
This research addresses the growing need for cost-effective alternative fuels. Rising fuel prices, dependence on fossil fuels, and interest in sustainable energy have increased efforts in biofuel production. Biofuel from algae is a more efficient alternative to traditional biodiesel from crops, because the average yield per acre is 300 times higher. Additionally, algae can be grown in environments unsuitable for food production, such as ocean water and wastewater. Combination of ultrasonication and optimized nutrients and enzymes shall increase the rate of biofuel production, so that biofuel from algae can become more economically viable than biofuel production using standard mixers. The present work specifically explored process optimization for growing algae, compared different strains for lipid content, and studied the effects of ultrasonication on biofuel extraction.
In the first stage, one strain of algae was grown, with and without nutrients added, with and without stirrers, with a continuous light source and without an air pump. The most significant growth occurred with Bold’s Basal Medium and constant stirring.

In the second stage, three separate strains, namely, Chlamydomonas reinhardi, Platymonas, and Haematococcus droebakensis, were investigated for maximum biomass yield and lipid production under identical conditions. Each strain was grown in reactors that were connected in parallel to an air pump, with constant light and mixing. The Bold’s Basal Medium was replenished every two weeks to ensure sufficient availability of nutrients. Regular gravimetric analyses showed that Chlamydomonas manifested the best growth. The algae were then allowed to grow and nutrients were added periodically to yield sizable biomass. Lipids were then extracted from these algal masses through ultrasonication, which ruptures the cell walls with high-frequency sound waves. Gas chromatography was then used to determine the composition of extracted lipids. These compositions could be later compared with those of diesels obtained from petroleum sources.

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**Title:** Removal of radioactive uranium from groundwater using nanoparticle technology and adsorption mechanisms

**Name(s):** Hannah Gray, Aditi Yokota-Joshi

**Submission Type:** Group

**Project Sponsor(s) and Collaborator(s):** Massoud Pirbazari, Viterbi School of Engineering - Astani Department of Civil and Environmental Engineering; Varadarjan Ravindran, Viterbi School of Engineering - Astani Department of Civil and Environmental Engineering

**Format:** Laboratory-based Research

**Abstract:**

Radioactive uranium contamination due to both natural and anthropogenic sources is a serious and global issue. Contamination sources include uranium mill tailings, hydraulic fracturing, and nuclear reactor accidents. Uranium can accumulate in groundwater, an important source of our drinking water. Hexavalent uranium in particular has serious health consequences, including increased risk of cancers, kidney disease, neurological damage, and reproductive defects. For protection of public health, the World Health Organization has set a limit for uranium in water sources of 15 ppb. As nuclear power increases in viability, the need for effective and economical remediation techniques increases. In nature, uranium is present in two valence states, namely, soluble and mobile hexavalent uranium, U(VI), and insoluble and immobile tetravalent uranium, U(IV). By reducing soluble U(VI) to U(IV) precipitates, uranium contamination can be removed from groundwater simply by filtration. This project will eventually compare two methods of removal of uranium from groundwater: biological reduction and biosorption by means of sulfate-reducing bacteria, and chemical reduction by addition of zero-valent iron nanoparticles.
Our current study focuses on the latter: removal by nZVI through an adsorption-reduction-precipitation mechanism. Primarily, we investigated adsorption of uranium on silica-sand particles, to determine the amount of uranium that will adsorb to a typical aquifer porous media. The adsorption data was well represented by a Langmuir adsorption isotherm model. Following this, aerobic and anaerobic rate and isotherm studies were performed to determine U(VI) removal by nZVI. Additionally, the effect of commonly found groundwater constituents, namely humic acid, on the adsorption rate and isotherm models was investigated. Uranium concentrations were determined using a Liquid Scintillation Counter (LSC), which measures the decay of radioactive particles, converting this energy into measurable light photons.

Category: Physical Sciences & Engineering
Name(s): Bridget Hellige, Max Wagner
Submission Type: Group
Project Sponsor(s) and Collaborator(s): Thomas Jordan, Department of Earth Sciences
Format: Laboratory-based Research
Title: Seismic Sequence Visualization Development Incorporating Focal Mechanism Data
Abstract: Members of the Southern California Earthquake Center Undergraduate Studies in Earthquake Information Technology Internship Program (USE IT) collaborated to address the 2011 Grand Challenge with the goal of producing eight movies using SCEC Virtual Display of Objects (SCEC-VDO). SCEC-VDO is the intern-developed visualization software that allows the user to see earthquake related phenomena in three dimensions. VDO visualizations were generated for the Tohoku (Japan), Canterbury (New Zealand), El Mayor-Cucapah (Mexico), Maule (Chile), Haiti, and Indonesian trench earthquake sequences. Each VDO begins with the relevant earthquake sequence animation (at depth) to give the viewer perspective of the breadth of the sequence. The VDO displays animations of the sequences in two views: 1) an overhead map view on the left, and 2) space-time on the right. This feature introduces the viewer to earthquake sequences relative to the dimensions of space and time. The movie then showcases the added Geographic Information Science (GIS) capabilities by overlaying earthquake sequences and ShakeMaps with GIS layers that highlight population density, nuclear power plants, and hospitals. A seventh VDO with GIS information and rupture simulations displays potential risks associated with earthquake hazards in Southern California, along the San Andreas Fault. An eighth VDO was created to highlight seismicity in Southern California and Northern Mexico showing where and when earthquakes occurred in California from 1991-2010. During the 2011-12 academic year, interns continued work analyzing various issues within SCEC-VDO, such as focal mechanism data and corresponding projections. The convention for displaying focal mechanisms in two dimensions involves a lower hemisphere projection while SCEC-VDO shows the full sphere, essentially providing an upper hemisphere projection in overhead view. The goal of this work is to make SCEC-VDO more user friendly and continue to improve its ability to display earthquake data that is both scientifically accurate and visually appealing.
Title: Statistical Machine Learning in Babbling-Based Human-Robot Interaction

Name(s): Andrea Lawler

Project Sponsor(s) and Collaborator(s): Maja Mataric, Viterbi School of Engineering - Department of Computer Science

Submission Type: Individual

Category: Physical Sciences & Engineering

Format: Laboratory-based Research

Abstract: The interaction itself consists of the following: first, the robot babbles for a certain hard-coded duration. Whenever the human interrupts to speak, the robot pauses for the duration of the human’s speech and records the length of the pause and the length of human speech, incorporating the collected data points into the Gaussian model for pause length and vocalization length, respectively. Once the person finishes speaking, the appropriate length for the robot’s pause is drawn from the Gaussian model. The robot then resumes its vocalization for a period of time drawn from the vocalization length Gaussian model before pausing again to allow the human to speak, and so on.

I will perform a validation experiment using the Aldebran Robotics Nao robot, a small full-body humanoid. The experiment will have two conditions: 1) the robot pauses to allow the human to speak but continues to vocalize without implementing speech timing; and 2) the robot emulates speech timing in both pause and vocalization duration. I hypothesize that the robot that emulates human interaction partner’s speech timing will induce more empathy across a number of metrics discussed below.

The experiment procedure’s conversational pattern, described above, will iterate until the ten-minute time frame ends. The robot will then drop a pencil. I will observe how long it takes the participant to help the robot to pick up the pencil and will then give a short survey with both open-ended and Likert-scale questions. I will calculate aggregated scores, how often the human refers to himself/herself and the robot as “we”, and how long it took to help the robot. I expect that the participants will score the robot more highly, will refer to the robot with “we” more often, and will take less time to help the robot in the condition with the learned timings.

Title: Temporal Changes in the Solar P-Mode Oscillations

Name(s): Daniel Campbell, Nathan Fulmer, Eric Hotchkiss, John Rising

Project Sponsor(s) and Collaborator(s): Edward Rhodes, Department of Physics and Astronomy

Submission Type: Group

Category: Physical Sciences & Engineering

Format: Laboratory-based Research

Abstract: We present a study of the temporal changes in the sensitivities of the frequencies, widths, amplitudes, and asymmetries of the solar ‘p’-mode oscillations during Solar Cycle 23 and the beginning of Solar Cycle 24. By computing 501 sets of ‘m’-averaged power spectra obtained from unaveraged full-disk dopplergram time series obtained from the MDI, HMI, and GONG instruments, we have fit a total of 4,659,806 peaks in these 501 sets of ‘m’-averaged power spectra using our WMLTP fitting code and symmetric Lorentzian profiles. We have also re-fit all 501 sets of ‘m’-averaged power spectra using our WMLTP fitting code and asymmetric profiles. When we inter-compared these 1002 tables of ‘p’-mode parameters and performed linear regression analyses of the differences in ‘p’-mode frequencies, widths, amplitudes, and asymmetries as functions of the differences in as many as ten different solar activity
indices, we have discovered new signatures of the frequency shifts, temporal shifts in the widths of the oscillations, changes in the asymmetries of the peaks, and an unexpected signature of the shifts in the amplitudes of the ‘p’-mode oscillations.

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**Category:** Physical Sciences & Engineering  
**Name(s):** Catherina Ticsay  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):** Veronica Eliasson, Aerospace and Mechanical Engineering  
**Format:** Laboratory-based Research  
**Title:** The Effects of Cavitation from Pulses Propagating through a Fluid-Filled Crack  
**Abstract:**

A series of experiments was conducted at the University of Southern California to investigate the characteristics of pressure pulses propagating through solids with fluid-filled cracks. A gas gun was used to simulate shock impact on polycarbonate structures; these polycarbonate structures were impacted on the edges by a cylindrical bullet traveling at an average speed of 70 m/s.

Optical visualization methods were used to capture shock impact and follow crack growth. These solid structures were tested for different scenarios, and crack propagation in a notched structure will be compared to that of a simple solid structure. Previous work on this project included using Schlieren optics to capture the pressure gradients upon impact, and also post-mortem fracture-surface analysis. Results obtained from previous methods have led to the observation that the addition of water creates further damage to test samples.

To help quantify these results, polarizers were added to the experimental setup to utilize the visualization methods photoelasticity and transmission caustics. Both methods are based on the relationship between transmitted light interference and the applied stress, and it is hypothesized that the effects of water can be marked by a significant change in the stress-intensity factor.

From initial test results using these methods, more adjustments need to be made to the experimental method in order to extract and interpret results in a more accurate manner. In addition to adjustments to the experimental method, the use of high-speed photography is necessary to track the crack speed and confirm the initial observations. Further investigation of damage characteristics, namely the role of shock-induced cavitation, is necessary to form conclusions about the strength of structures.

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**Category:** Physical Sciences & Engineering  
**Name(s):** Eric Siryj, Thomas Topping  
**Submission Type:** Group  
**Project Sponsor(s) and Collaborator(s):** Veronica Eliasson, Department of Aerospace and Engineering  
**Format:** Laboratory-based Research  
**Title:** The Effects of Fluid on Crack Propagation in Polycarbonate  
**Abstract:**

When a material is cracked, it becomes extremely susceptible to fragmentation due to impact. The extent of this fragmentation is, in large part, determined by the conditions the material is in. A series of experiments was conducted to explore the effect that fluid has on crack growth in polycarbonate. Acetone was used to create hairline fractures in the polycarbonate. The cracks were either filled with glycerol or kept dry. The samples were then shot with projectiles and filmed with high speed cameras. When analyzing the results, it was found that the cracks that were wet grew faster when impacted than did the cracks.
that were dry. These cracks also showed signs of more violent growth. This implies that in extremely wet environments, damaged materials are at a greater risk of violent fragmentation than the same material would be in a dry environment.

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Category: Physical Sciences & Engineering
Name(s): Irene Gow
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Thomas Jordan, Earth Sciences
Format: Field Research
Title: The Impact of the Earthquake Country Alliance (ECA) Earthquake Education and Public Information Center (EPIcenter) Network

Abstract:
Ranging from designed spaces to everyday activities, informal learning environments account for the majority of the public’s science knowledge and education. Despite an increase in research of informal science learning over the past 50 years, there remains a need for comprehensive outcome measures. Established evaluation methods would improve overall science learning and the management and accountability of informal learning institutions. This study was conducted to address the current lack of methodology through the development of impact measures for the Earthquake Country Alliance (ECA) Earthquake Education Public Information Center (EPIcenter) Network.

Formed in 2008, the ECA EPIcenter Network currently consists of over 60 informal learning institutions throughout California. Members of the Network are committed to encouraging earthquake and tsunami preparedness through demonstrated leadership in risk-reduction and education. Grounded Theory, a qualitative methodology, was used to develop evaluation methods for the Network through simultaneous data collection and analysis. Open-ended interviews were conducted with six Members of the Network’s Southern California Region, a convenience sample representing five types of informal learning institutions (e.g., museums, children’s museums, libraries, science centers, and outdoor areas). Data from the interviews were incorporated into logic models, graphical representations of program outcomes.

The logic models for the six informal learning institutions and overall Network revealed similar theoretical long-term outcomes: strengthened community partnerships, the incorporation of earthquake science into different contexts, increased awareness of earthquakes, and increased community earthquake education, earthquake preparedness, and knowledge of earthquake science. Continued refinement of the use of logic models to measure the impact of the Network and informal learning institutions is needed through the collection of quantitative data. The development of comprehensive impact measures will not only affect the sustainability of the ECA EPIcenter Network and other informal learning institutions, but also affect statewide, national, and international approaches to earthquake education and emergency preparedness.

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Category: Physical Sciences & Engineering
Name(s): Sarah Hester, Steven Leverette, William Murray
Submission Type: Group
Project Sponsor(s) and Collaborator(s): Dan Erwin, Department of Astronautical Engineering; Joseph Kunc, Department of Astronautical Engineering
Format: Laboratory-based Research
Title: Thrust Augmentation of a Solid Rocket Motor by Means of Inert Gas Injection
Abstract:
According to rocket propulsion theory, by injecting a large mass flow of an inert gas into the combustion chamber of a solid rocket motor, the chamber pressure can be raised, significantly accelerating the rate of combustion. This in turn ought to produce a temporary thrust increase. Analytic models of this phenomenon were tested using a 3” diameter solid propellant BATES grain, first without any gas injection for a baseline, then with nitrogen injection at different stages of the burn profile. All test cases with nitrogen injection showed an increase in thrust and an overall increase in total impulse. The largest thrust increase observed occurred when gas was injected during the progressive portion of the burn and resulted in an approximately 24% thrust increase. Additional tests showed an approximately 10% thrust increase when injection occurred during a neutral portion of the burn. The thrust decrease observed after injection cut-off was approximately 1.5%, an order of magnitude lower than the predicted value.

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Title: Unraveling Our Human History: Habitats of Early Hominid Evolution
Analysis of the δ13C Values of Plant Leaf Waxes in a Marine Sediment Core

Abstract:
Key evolutionary features, such as bipedalism, are widely regarded as an adaptive response to climate. To better understand what climate conditions drove these adaptations, paleoenvironmental reconstructions can be produced using terrestrial plant leaf waxes preserved in marine sediments. Plant leaf waxes are transported by wind and deposited in marine sediments, containing an isotopic fingerprint, the carbon isotopic composition (δ13C), that records which photosynthetic pathway, C3 or C4, was terrestrially dominant at that particular time. C3 plants thrive in cool, wet conditions corresponding to a forested environment, while C4 plants thrive in hot, dry conditions such as grasslands. By observing oscillations in the δ13C values, the shift between forested canopies to open savannah can be observed, allowing us to reconstruct habitats for early human evolution. Marine sediments were analyzed from Deep Sea Drilling Project Site 231 in the Gulf of Aden corresponding to 3.8-4.2 Ma, an age range of particular interest because it encapsulates some of the earliest bipedal hominids. Approximately 100 samples were processed, first isolating the plant leaf waxes by conducting accelerated solvent extraction and column chemistry, then using mass spectrometry, gas chromatography, and isotopic ratio analyses to determine δ13C values. Results showed an opening in the landscape between 4.2 and 4.0 Ma, indicated by a ~4.6‰ shift to less depleted δ13C values, and then a return to more depleted δ13C values from 4.0 to 3.8Ma indicated by a ~ -3.7‰ shift showing C3 dominance. In comparison, the overall range of variability between pure C3 and pure C4 ecosystems is ~15‰. This study is part of a larger effort to reconstruct the long history of paleoenvironments spanning the last 12 million years.
Volcanic Activity Recorded by Microtephra in the Gulf of Aden from 4.9 - 5.2 Ma

Abstract:
Tephra from volcanic eruptions are an important means to date the geological record in and around volcanically active regions. Volcanic activity has been well documented in the East African Rift valley since the Oligocene with glassy shards from explosive eruptions reaching the marine sediments of the Gulf of Aden thousands of kilometers from source, numerous times in the last 4 million years. Tephra from earlier eruptions are also likely to have reached the marine sediments and would provide valuable means to date the marine core, connect the marine and terrestrial sedimentary sequences and to record the frequency of the most explosive eruptions. We searched for the presence of tephra in marine sediments of DSDP Site 231 from 4.9 to 5.2 Ma. We determined that no tephra are visible to the naked eye in these sediments. Furthermore, sieving and density separations to concentrate large fragments and silicaceous minerals also indicated the absence of so-called ‘cryptotephra’, found in younger sediments. While we did not identify eruptions we found that feldspars can have densities, morphologies and isotropic properties that may be hard to differentiate from volcanic glass. In this case electron microprobe analysis was the only means to identify that these were not tephra. These findings will be cataloged at LACCORE to inform future cryptotephra studies.
Social Sciences

Title: "I'm a DREAMer": Undocumented Latino Youth and the Federal DREAM Act

Name(s): Christina Wilkerson
Project Sponsor(s) and Collaborator(s): Jody Vallejo, Sociology
Submission Type: Individual
Category: Social Sciences
Format: Field Research
Abstract:
In 2001 the Federal DREAM Act, a bipartisan legislative bill, was introduced to congress. This bill makes it possible for undocumented youth living in the United States to obtain citizenship by completing two years of higher education or military service within a six year period. Currently, the DREAM Act has yet to pass as a federal law. California has the largest percentage of undocumented immigrants (Flores, 2009). Moreover, 4.7 million Latinos live in Los Angeles County making the greater Los Angeles area the largest Latino population in the nation (Pew Hispanic Center, 2009). This study considers the questions: What are the societal and economical factors that influence undocumented Latino students’ choice towards college enrollment pathways in the Los Angeles region? Secondly, what is the general attitude these Latinos have pertaining to the military component of the DREAM Act? Through the use of grounded theory research methodology this study compares interviews of undocumented Latino youth in Los Angeles. Additionally, the researcher analyzes the perceptions that this population has regarding the military component of the bill.

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Title: "I can’t relate": Failure to recall relevant personal experiences undermines compassion

Name(s): Mark Lay, Brooke Sanders, Denise Yeung
Project Sponsor(s) and Collaborator(s): Mary Helen Immordino-Yang, USC Brain and Creativity Center, USC Rossier School of Education, USC Department of Psychology
Submission Type: Group
Category: Social Sciences
Format: Laboratory-based Research
Abstract:
Feeling compassion is predicated on establishing empathy for a person in distress, but the availability of personal memories in facilitating empathic concern is understudied. During a 2-hour private interview, we induced compassion in 32 young adults by exposing them to true social stories about innocent people in distress. Of the 16% of trials in which participants reported a reaction other than compassion toward the story protagonist, 30% reflected an inability to recall relevant personal memories. Furthermore, younger participants, who presumably have fewer experiences and memories to draw from, failed more often. Our results support the idea that feeling compassion is built upon the ability to connect oneself to another’s situation, and underscore the role of personal memory in this process.
Category: Social Sciences
Name(s): Jordan Weiss
Submission Type: Individual
Project Sponsor(s) and Collaborator(s):
Michael Sproul, Department of Economics
Format: Analytical Paper
Title: Antitrust: Policy, Prices, and Behavior
Abstract:
Past studies examining antitrust activity are inconclusive. Some have shown that antitrust prosecution results in lower prices (Stigler and Kindahl, 1979), while other studies have shown the opposite (Sproul, 1993), and some indicate no effect on price (Newmark, 1988). The purpose of this research is to determine the effectiveness of antitrust prosecution. Specifically, to determine how a statute change has affected the pricing behavior of firms indicted for price fixing. The analysis uses 15 cases which were filed between 1994 and 2006. Average prices were found to rise in cases which were filed prior to a change in penalties, and fall in cases which were filed after the imposition of these harsher penalties. Further analysis indicates this change in pricing is statistically significant, suggesting that the increased penalties act as a deterrent.

Category: Social Sciences
Name(s): Andrea Krajisnik, Lauren Truong, Matt Wong
Submission Type: Group
Project Sponsor(s) and Collaborator(s):
Adam Leventhal, Preventative Medicine and Psychology
Format: Laboratory-based Research
Title: Anxiety Sensitivity as a Predictor of Acute Subjective Effects of Smoking
Abstract:
Anxiety Sensitivity (i.e., AS; the degree to which one believes that anxiety and its related sensations are harmful) is a stable trait that is associated with habitual smoking. One hypothesis that may explain the AS-smoking link posits that individuals with high AS are more sensitive to the acute subjective effects of smoking and are therefore more prone to nicotine dependence. This study examined trait AS as a predictor of several subjective effects of cigarette smoking in non-abstinent smokers. Adult non-treatment-seeking smokers (N=87; 10+cig/day) participating in a study of tobacco deprivation effects each completed a measure of AS during a baseline session. On a subsequent session in which participants were asked to smoke normally before their appointment, each subject smoked a cigarette of their preferred brand at the outset of the visit. Self-report measures of affect and cigarette craving were completed before and after smoking. Following smoking, post-cigarette ratings of various subjective smoking effects were provided by participants. AS predicted greater increases in positive affect pre to post cigarette (Beta = .30, p = .006). Regarding post-cigarette subjective ratings, AS predicted greater satisfaction, pleasant taste, calming effects, concentration enhancement, alertness, irritability reduction (Betas = 23 to 48, p < .03). Each of these effects remained statistically significant after adjusting for anxiety symptom severity, nicotine dependence severity, demographics, and depressive symptom severity. AS did not predict changes in negative affect, craving, post-cigarette hunger reduction, dizziness, nausea, or enjoyment of inhalation sensations. Adult smokers with higher AS appear to be more sensitive to several subjective positive reinforcing effects of smoking as well as smoking’s influence on irritability. AS was not associated with craving reduction, aversive subjective effects, or several negative reinforcing effects. These findings shed light on the mechanisms linking AS and smoking, and may be relevant for tailored interventions.
targeting high-AS smokers.

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**Category:** Social Sciences  
**Name(s):** Kalena Giessler, Parin Patel  
**Submission Type:** Group  
**Project Sponsor(s) and Collaborator(s):** Lynn Swartz Dodd, Religion  
**Format:** Field Research  
**Title:** ARC You Smarter Than A 6th Grader?

**Abstract:** ARC Smart is a standards-based curriculum enrichment program partnership between Los Angeles Unified School District and the USC Archaeology Research Center. In five weekly classroom meetings, undergraduate student volunteers from USC provide sixth graders with the opportunity to participate in hands-on activities which engage them in problem-solving, close observation, and analytical skills, while they learn about the importance of conservation and distinctions and similarities between modern and ancient societies. Sixth grade students view, and physically interact with, ancient artifacts from Egypt, Greece, Rome, Mesopotamia and India. Through the use of small-group activities the students engage in interactive learning and acquire deductive reasoning and critical thinking skills that will prepare them for the Grade Six California Content Standards in Social Studies.

Our pre- and post-program assessments track student progress. The results from past sessions show significant growth in learning and clear retention. During the first session, USC student volunteers bring real ancient artifacts that students can independently handle in order to gain firsthand knowledge about ancient cultures. In the next session, students learn to use InscriptiFact, a 21st century image database that contains high resolution, mobile light digital images that enables students to closely examine the artifacts they handled previously. In addition, these images are accessible online at no charge, so the students can view them from any computer with internet access. The third session utilizes another online tool readily available to the students, Google Earth, to show them where these civilizations were geographically located in relation to themselves and to introduce the environmental diversity in which these civilizations developed. In the fourth session, students simulate an archaeological excavation in order to learn about deductive reasoning, hypothesis testing, stratigraphy, and artifact analysis. The final session is a Jeopardy-style question-and-answer game combining everything that the students learned and helps gauge information retention.

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**Category:** Social Sciences  
**Name(s):** Rohit Jayakar  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):** Mara Mather, Davis School of Gerontology; Michiko Sakaki, Davis School of Gerontology  
**Format:** Laboratory-based Research  
**Title:** Association learning of emotional harbinger cues is modulated by awareness of cue-outcome contingencies

**Abstract:** Memory uses past experience to predict when something important may happen next. Mather & Knight (2008) showed that cues predictive of emotional outcomes produced worse associative memory than those predictive of neutral outcomes. In this study, participants first viewed neutral cues followed by negative or neutral outcomes (cue-learning phase). Participants then learned associations between the harbinger cues and other contextual details (association learning phase). Their results indicated that participants showed worse association learning performance for
emotional harbinger cues than for neutral cues.

However, the opposite pattern was found in subsequent experiments, in which they used a slightly different procedure. A difference in the procedure was whether participants were explicitly told to learn cue-outcome associations during the cue-learning phase or not. That is, in Mather and Knight (2008) participants were told to passively observe cues and emotional/neutral outcomes during the cue-learning phase, but in these subsequent studies, they were explicitly told to learn which cue predicted emotional outcomes during the cue-learning phase. This suggests that whether people are aware of the cue-outcome associations influences memory for emotional harbinger cues. Therefore, in the current study, we addressed the possibility that the awareness of cue-outcome contingencies might influence memory for emotional harbinger cues.

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**Category:** Social Sciences  
**Name(s):** Benjamin Heikali  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):** Lisa Aziz-Zadeh, USC Brain and Creativity Institute; Jo Ann Farver, Psychology; Mona Sobhani, USC Brain and Creativity Institute  
**Format:** Senior Honors Thesis  
**Title:** Attentional Modulation: A Potential Alternative Argument for a Psychopathic Population  
**Abstract:**

Psychopathy is a serious personality disorder characterized by superficial charm, egocentricity, lack of empathy, callousness, deceitfulness, and shallow emotions. Although the predominant etiological theory of psychopathy hypothesizes that an emotional deficit underlies the disorder, a recent theory, the Response Modulation Theory, posits that a fundamental attentional processing deficit may provide an alternative explanation for the devastating behaviors and attitudes prevalent in the psychopathic population. A host of research has begun to support the notion that psychopaths may possess attentional modulation deficits that consequently inhibit sufficient allocation of attention to peripheral cues and information. As a result, as research indicates, individuals with psychopathic traits may over-focus on a relevant task at hand, and therefore overlook secondary information crucial to behavioral adaptation and regulation in social settings.

In the present study we examined whether psychopathic traits were linked to overall self-perceived attentional control, as well as its sub-components (focus and shifting). A hundred undergraduate males were administered questionnaires measuring psychopathy, anxiety, and attentional control. We grouped individuals scoring in the top 75th percentile on psychopathy and compared them to individuals scoring in the bottom 25th percentile. Inconsistent with our predictions, individuals scoring high on psychopathy scored lower on perceived attentional focus than individuals scoring low on psychopathy, while the two groups exhibited no significant difference in perceived attentional shifting ability. Additionally, our prediction that the discrepancy between attentional focus and shifting would be significantly higher for the high psychopathic trait group, was refuted. Our prediction that the two groups would not score significantly different in attention control, a combined measure of attentional focus and shifting, was supported however. These results suggest that while overall attentional control between high and low psychopathic trait groups may not significantly differ, attentional focus may show significant group differences, though in a direction contrary to our predictions.
Banning the Bag: local activism and the problems of collective action

Christopher Robinson
John Barnes, Political Science
Individual
Social Sciences
Analytical Paper

One of the most fundamental parts of politics in the United States is the ability for citizens with a similar interest to collectivize into groups. An interest group is any organized number of people with a specific, policy-based goal. Interest groups serve to provide information and ideas, mobilize populations, set agendas, raise money, and advocate to government. Mobilization and counter mobilization of interest groups are what make up the complex tug-of-war over public policy. This process as a whole is known as collectivization. Much of the contemporary literature about collectivization (Olson 1965, Moe 1980, Walker 1983) focuses on the national stage. However, a great deal of interest group activity, including grass roots activism, takes place in cities and counties at the local level. Outcomes of this collectivization do not necessarily reflect the expected outcomes based on the research.

This paper analyzes the effectiveness of collectivization at the local level using empirical data from an environmentalist campaign to ban plastic bags in cities and counties within the state of California. It seeks to answer two fundamental questions. First, what are the determinants of success for activists, especially against a more experienced or better financed counter-mobilization? Second, what are the implications of the outcomes of campaigns at the local level? Should they be considered autonomous events or do they indirectly serve collectivization on a larger scale? Furthermore, in what situations can we expect the California bag ban scenario to be replicated?

Beyond the Leaks: What WikiLeaks Tells Us About Us

Jolynn Tjahyadi Tjhia
Kevin Egan, Writing
Individual
Social Sciences
Analytical Paper

The release of top-secret cables by WikiLeaks has been received with varying degrees of interest across different countries. Certain segments of society employ it as a tool to galvanize the movement toward governmental transparency while other segments choose not to employ it at all and do not seem to be as concerned about the issue of governmental transparency. The most interesting lesson to draw from these observations is not so much on the efficacy of WikiLeaks in bringing about change, but on the values that people hold, which can actually be deduced from their responses to the leaks. To merely conclude that different people hold different values (on government transparency, in this case) is too simple and inaccurate. In recognizing that some segments of society seem to value transparency due to dissatisfaction with the current state of affairs and the desire for political change, and that other segments seem to be more indifferent toward the attainment of transparency due to contentment with the status quo and the desire for continued stability, we understand that all segments of society actually value favorable outcomes through whichever means, rather than the attainment of the absolute value of transparency.
Category: Social Sciences
Name(s): Amber Brink
Submission Type: Individual
Project Sponsor(s) and Collaborator(s):
Daryaneh Badaly, Graduate Student, Clinical Psychology; David Schwartz, Dornsife College of Letters, Arts and Sciences (Psychology)
Format: Field Research
Title: Body Dissatisfaction and Depressive Symptoms in Adolescence: The Moderating Role of Academic Achievement
Abstract:
Depression is one of the most prevalent mental health concerns in adolescence (Lewinsohn et al., 1993). From a developmental psychopathology framework (Cicchetti & Toth, 1998), depression is likely tied to salient developmental processes. For instance, pubertal maturation yields a variety of physical changes, accompanied by changes in adolescents’ body esteem (Ohring et al., 2002). Body dissatisfaction is, in turn, associated with depressive symptoms (e.g., Siegel et al., 1990). The transition to high school also brings about an increased importance of academic success, and successful academic performance is associated with decreased vulnerability for depressive symptoms (Schwartz et al., 2008). Given the interactive processes between areas of developmental change, we examined the potential moderating role of academic achievement on the link between body dissatisfaction and depressive symptoms. Consistent with prior research, we expected lower body esteem to be associated with higher distress, and anticipated that this effect would be attenuated for adolescents with high levels of academic success.

We recruited a gender-balanced sample of 369 ninth graders from a high school in Southern California. Students completed group-administered questionnaires including self-report items assessing body dissatisfaction regarding thinness and muscularity, and depressive symptoms. Academic achievement was indexed by standardized test scores.

We found that females who were more dissatisfied with their thinness and males who were more dissatisfied with their muscularity endorsed more depressive symptoms. In addition, academic achievement moderated the associations between body dissatisfaction and depressive symptoms for both adolescent girls and boys. Consistent with our hypothesis, for both females and males, the positive relation between being dissatisfied with one’s appearance and depressive symptomology was stronger for those with low levels of academic achievement. Future intervention efforts related to body dissatisfaction and depressive symptomology would benefit from considering the role of competencies in varied domains including academic functioning.

Category: Social Sciences
Name(s): Lu Zhang
Submission Type: Individual
Project Sponsor(s) and Collaborator(s):
Eileen Crimmins, Davis School of Gerontology; Jung Ki Kim, Davis School of Gerontology
Format: Senior Honors Thesis
Title: Cardiovascular Health Disparities and Risk Factors in Chinese Older Adults: Analysis of the 2008 CHARLS Pilot
Abstract:
Background: The health and nutritional environments have transformed significantly in China during the last twenty years, with a decline in communicable diseases and a rapid increase in chronic illnesses such as cardiovascular disease. However, effects of these changes on the aging population have received relatively
little attention even though the older population is the fastest growing age group in China. My research focuses on the differences in prevalence and correlation between cardiovascular health indicators and socioeconomic and demographic risk factors.

Methods: I will be analyzing data collected in the 2008 cross-sectional pilot survey of the Chinese Health and Retirement Longitudinal Study (CHARLS), with 2,529 adults aged 45 and over included in the analysis. SAS was used for statistical analysis. Cardiovascular health indicators include hypertension and high cholesterol, which are both self-reported and measured in order to provide indicators of high risk conditions, and knowledge of these conditions. Gender, rural and urban residence, education, and obesity (as indicated by BMI) are all related to CVD health risks, and are included in the analysis. Both descriptive and correlational analyses were done.

Results: The results indicate relatively high prevalence of hypertension and high cholesterol among older Chinese adults, with rates of 46.43% and 36.76%, respectively. The prevalence of both indicators is highest among urban residents, women, the uneducated, and overweight individuals. However, under-diagnosis of CVD risk indicators remains a severe issue, especially among the rural residents, women, the uneducated, and underweight and normal weight individuals. Under-diagnosis appears to be associated with gender, rural/urban residence, and weight.

Conclusion: The high prevalence of CVD risk indicators raises alarm over the health education, provision, and management of older adults in China. At the same time, demographic and geographic barriers prevent further CVD education and diagnosis. The issue is more severe among rural, female, and uneducated individuals.
families were recruited for participation in a larger, longitudinal study of the impact of multiple forms of violence exposure on youth development and family functioning. In addition to the observational coding data, adolescent psychological symptoms were collected using a self-report measure (the Child Behavior Checklist; Achenbach, 1991) and family history of conflict and aggression was assessed using adolescent, mother, and father report on the Domestic Conflict Inventory (Margolin, Burman, John, & O’Brien, 2000). Data will be analyzed using multiple regression models and the implications of results for understanding the role of family environment in developmental psychopathology will be discussed.

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Category: Social Sciences
Name(s): Jacqueline Siegle
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Thomas D. Lyon, Gould School of Law
Format: Senior Honors Thesis
Title: Children’s Emotional Reactions to Sexual Abuse
Abstract:
In a court setting, a child’s testimony in a sexual abuse case is crucial because most often, besides the abuser, the child is the only other witness to the crime. Although research has explored the effects of sexual abuse on children’s adjustment and mental well-being, very little research has actually explored the child’s perspective after his or her victimization. This is most likely attributable to the widely held belief that children are unable to accurately describe their reactions to their abuse. This view has been challenged by studies that have indicated when questioned properly, children can offer highly comprehensive reports of their abusive experiences. In this study, I hypothesised certain predictors may increase the likelihood of a child responding to sexual abuse with a particular emotion. These predictors included the child’s age, the relationship of child to abuser, type of abuse, and severity of abuse. Two previous studies investigated the extent to which children provided emotional, cognitive, and physical reactions, when replying to questions asked by evaluators. The first study evaluated the court trial transcripts of felony child sexual abuse cases. The second study examined interview transcripts of children who had disclosed their sexually abusive experiences. This data was used to compile the children’s emotional, cognitive, and physical reactions from their perspective.

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Category: Social Sciences
Name(s): Lei (Lisa) Cui, Emily Gee
Submission Type: Group
Project Sponsor(s) and Collaborator(s): Ann Crigler, Political Science
Format: Field Research
Title: Chinese and American Emotional Responses to Environmental Advertisements
Abstract:
Do Chinese and American students feel the same emotions when they see the same environmental ad? Or do they react differently? How do their emotional reactions relate to their actions, if at all? China and America both encourage their citizens to take part in environmental conservations through environmental advertising. The Appraisal Theory argues that a person’s emotional evaluation of a situation is based on how important that event is to their well-being. The Discrete Emotions Theory suggests that the more worry is felt, the more likely the person would be willing take action to alleviate the worry. Environmental advertising in America often features negative images that try to elicit fear from their audience, using their worry as a motivation for their action. Chinese advertisements on the other hand are more positive and upbeat,
due to censorship, politics, and culture. We examined how Chinese and American students appraised both negative and positive advertisements as well as how the emotional outcome of their appraisals affected their actions. We surveyed a total of 407 students from six universities and conducted 30 focus groups in these two countries for our research project. While we believed that fear-based ads from America would cause Chinese students to worry more than American students when viewing this ad, we found surprising results. Overall we found that when viewing either negative or positive advertisements, Chinese students were simultaneously more worried and hopeful than the American students. Furthermore, Chinese students indicated that the more hopeful they were, the more likely they were to engage in conservation activities. These results, along with comparisons of Chinese and American students’ outlook about the environment, paint a detailed and complex picture about the difference and similarities in attitude towards the current state of the environment.

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Title: Collegiate Student-Athlete Identity: Ethical Dilemmas and Moral Foundations
Name(s): Lauren March
Project Sponsor(s) and Collaborator(s): Jesse Graham, Psychology
Submission Type: Individual
Category: Social Sciences
Abstract:
The purpose of this proposed study was to examine how priming student-athletes with a specific identity leads to differences in moral judgments. This study recruited student-athletes from the University of Southern California, an NCAA Division-I institution. Participants were randomly assigned into a student-prime group, an athlete-prime group, or a control condition, and filled out a questionnaire about the certain identity with which they were primed. The survey then provided various scenarios that presented ethical dilemmas based on Moral Foundations Theory. First, it was hypothesized that priming student-athletes with their athletic identity will lead participants to have greater concerns for Ingroup/loyalty violations. Second, it was hypothesized that priming student-athletes with their academic identity will lead participants to have greater concerns for Fairness/reciprocity and Authority/respect violations.

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Title: Creatures and Contexts of Habit: Choosing Self-Help Strategies for Ourselves and Others
Name(s): Julia Cooperman
Project Sponsor(s) and Collaborator(s): Wendy Wood, Social Psychology; Jennifer Labrecque, Social Psychology; David Neal
Submission Type: Individual
Category: Social Sciences
Abstract:
Many people struggle with a detrimental habit, such as nail biting or overeating. The present research investigates the psychological processes underlying these habitual behaviors, behavior change strategies, and participants’ expectations of their own success and the success of others. Respondents to an online survey provided a problem behavior, either their own behavior or that of a friend. In the ‘self’ condition of the study, participants rated the habit strength of their identified problem and selected a title from a series of self-help books that they judged as most effective for their behavior. In the ‘friend’ condition of the study, participants filled out the same survey for their friend. Some books emphasized willpower and goals to change unwanted behaviors, whereas others emphasized changing the contexts of performance. The study yielded several
interesting findings that comment on our expectations of behavior change and our comparison of ourselves to others.

### Demand/Withdraw across Family Subsystems as a Predictor of Parent-to-Child Aggression

**Category:** Social Sciences  
**Name(s):** Amanda Spoto  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):** Brian Baucom, Department of Psychology  
**Format:** Senior Honors Thesis  
**Title:** Demand/Withdraw across Family Subsystems as a Predictor of Parent-to-Child Aggression

**Abstract:**
Aggression towards a child has significant repercussions since it affects a child’s adjustment and wellbeing. Improving intervention methods by understanding the parent-child conflict patterns associated with it may result in reduced incidence of parental aggression towards their children. One of these conflict communication patterns that has been associated with increased risk for aggression is the demand/withdraw pattern. Demand/withdraw is a dyadic conflict interaction that occurs when one communication partner engages in demanding behavior, such as complaining or criticizing, while the other partner engages in withdrawing behavior, such as changing the subject or avoiding involvement in the conversation. In the couples’ literature, it has been associated with problematic outcomes such as marital dissatisfaction and aggression. Although there is little research on parent-adolescent demand/withdraw, the few studies conducted have already shown associations with maladjustment in the adolescent. In this study, the relationship among parent-parent demand/withdraw, parent-adolescent demand/withdraw, and aggression will be investigated. Measured variables will include the adolescents’ perceived levels of demand/withdraw between parents, between each parent and the adolescent, and levels of physical and psychological aggression by the parent towards the adolescent. It is hypothesized that higher levels of mother-father (couple) demand/withdraw will predict higher levels of total parent-to-child aggression, higher levels of parent-child demand/withdraw will predict higher levels of total parent-to-child aggression, and parent-child demand/withdraw will mediate the relationship between couple demand/withdraw and aggression. Regression analyses will be used to test these hypotheses.

### Determinants of Clean Energy Altrium in Los Angeles

**Category:** Social Sciences  
**Name(s):** Sean Hernandez  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):** Juliana Wang, Environmental Studies  
**Format:** Analytical Paper  
**Title:** Determinants of Clean Energy Altrium in Los Angeles

**Abstract:**
California Assembly Bill 32, known as the Global Warming Solutions Act, establishes a goal of “maximum technologically feasible and cost-effective reductions” in greenhouse gas emissions by 2020. Since the bill’s passage in 2006, an economy-wide regimen of standards promoting both reductions in energy consumption and the reconfiguration of supply infrastructure have gone into effect, including a renewable portfolio standard (RPS). The 33% renewable generation by 2020 standard is proudly identified by Public Utilities Commission as “one of the most ambitious energy standards in the country.” The long-known challenge to policymakers and regulators is to minimize fluctuations in energy prices as renewable systems come online, bringing about much-appraised phase out of fossil fuel electricity.

Among the tools used by LADWP to integrate renewables is the Green Power
Program, under which customers – both residential and commercial - elect to pay a “Green Premium” on a portion of their electricity consumption. Insofar as this behavior is dramatically counter to the rational actors model of action assumed by neoclassical economics, an explanation of consumer preferences is in order. In this study, the population of Green Power Program participants will be analyzed in a logistic regression model to estimate the probability of participation conditional on variables including: income, household size, location, monthly usage, industry, and political affiliation. Using data over time, the analysis will illuminate factors that cause different populations of consumers to opt in or out of the program.

The research will join the current body in behavioral and energy economics that attempts to design a set of incentives to produce a cost-minimizing transition to a sustainable energy paradigm.

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Category: Social Sciences
Name(s): Nicole Cruz
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Franklin Manis, Psychology Department
Format: Senior Honors Thesis
Title: Do Adults with Dyslexia Have Superior Creativity?
Abstract:
As separate constructs dyslexia and creativity have been widely studied. However, the relation between the two areas needs to be further explored. Previous research has indicated that individuals with dyslexia have superior creative skills compared to nonimpaired readers. Yet, researchers have failed to describe the type of conditions that individuals with dyslexia can most effectively be creative. In this study, college students with and without dyslexia were evaluated on two types of creativity tasks, verbal and figural, under both a timed and untimed condition. Given the deficiency of language processing in dyslexia, it was predicted that under the timed verbal creativity test participants with dyslexia would perform worse than the control group. In addition, considering the lack of literacy skills necessary for the figural task it was expected that adults with dyslexia would outperform the control group in both the timed and untimed conditions. Lastly, it was predicted that without the time constraint in the untimed verbal condition those with dyslexia would score higher than the control group.

Statistical analyses indicated that none of the hypotheses for the study were confirmed. In both the timed verbal and untimed verbal conditions, the dyslexic group produced more responses to the creativity tasks than did the control group. Although the dyslexic group did produce more responses in the untimed verbal condition, it was not statistically significant. In addition, in both of the figural creativity assessments the control group outperformed the dyslexic group.

The unexpected results of this study likely arise from the small sample size. Recruiting students with dyslexia was extremely difficult, despite the numerous methods used. It is because of these limitations that this study should be considered a pilot investigation into this intriguing phenomenon. Further research should continue studying possible strengths of dyslexia in order to better understand the reading disability.

§§§§
Effects of Vision for Vision Community Outreach on Attitudes/Behavior regarding Eye Exams

Karen Fang, Conner McMains, David Mittelstein, Annie Wang

Brian Francis, Doheny Eye Institute

Group

Social Sciences

Field Research

Glaucoma, an eye disease damaging the optic nerve, is the second leading cause of vision loss in the US. While there have been great strides in glaucoma treatment, many older adults do not have access to knowledge about preventative measures. A major goal is thus to encourage patient pro-activity for annual eye examinations to diagnose glaucoma and other degenerative eye diseases in their early stages. By implementing the Health Belief Model (HBM) of HPDP theory with a streamlined multimedia presentation, Vision for Vision (V4V) intends to instill self-efficacy in target audience members to prevent ocular disease. V4V’s unique direct community outreach method creates an innovative intervention technique that ensures delivery through direct, facilitated exposure for subjects as well as personalized responses for both answering questions and clarification on potentially difficult topics. Our interest is in ascertaining the effectiveness of V4V’s presentation methods in changing (1) the attitude toward a health behavior (annual eye examinations) and (2) actual integration of said behavior into a healthier lifestyle. The primary venue of delivery will be senior centers in the Greater Los Angeles area, where the at-risk demographic (seniors at or above the age of 50 years) can be most effectively reached and in highest numbers. Nominal, anonymous data obtained from a medical history/attitude questionnaire and comprehension quiz (the latter administered at random either at the beginning or end of the presentation) will provide insight into whether audience members retain pertinent information and/or change their attitude toward eye exams. A follow-up phone consultation six months after data collection will determine whether health behavior has been modified. V4V intends to continue implementation until May 2013. The data is expected to reflect (1) increased frequency with which audience members go for comprehensive eye examinations and (2) an increase in basic knowledge about the risks of glaucoma.

Effects of Watching Extreme Partisan Media

Todd Desaulnier

Wendy Wood, Dornsife College of Letters, Arts and Sciences

Individual

Senior Honors Thesis

Senior Honors Thesis

The purpose of this proposed study is to examine the effect of today’s polarized political climate on individuals. Previous research suggests there have been increases in political polarization, increases in political media hostility, and that social factors may influence physiological responses. In addition, current research indicates a possible relation between political polarization and media hostility, yet it remains unclear whether this relation has effects on viewers of politically hostile media. To test for an effect, 90 participants drawn from a community sample will be presented with a news clip from current media. News clips will depict two extremely contrasting political ideologies on controversial social topics, each ideology will range from extreme liberal to extreme conservative. In addition, participants’ stress will be measured before and after they view these media clips. It is
hypothesized that (a) individuals who watch politically polarized news clips consistent with their own ideology will experience an increase in stress, and (b) if the politically polarized message is inconsistent with their ideology there will be a reduction in stress.

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Category: Social Sciences
Name(s): Leandra Fraser
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Penina Segall-Gutierrez, Co-Director, Family Planning Fellowship, Co-Director, Diabetes and Pregnancy Service, Assistant Professor of Clinical Obstetrics and Gynecology and Family Medicine
Format: Field Research
Title: Es Mejor Saber: A Proactive Approach to Gestational Diabetes Follow Up

Abstract:
Women with recent gestational diabetes mellitus (GDM) are at high risk for developing type 2 diabetes (T2DM), yet few return for postpartum diabetes screening and care. The purpose of this randomized trial was to determine if an intervention where a community health worker (promotora) providing education, reminders and help accessing the system of care could increase participation in postpartum diabetes screening and referral for diabetes or preventive care.

Spanish or English speaking women with GDM were recruited during the delivery admission if they did not have overt diabetes, had telephone access, and lived within sixty miles from and received care within the Los Angeles County + University of Southern California (LAC+USC) Network. Subjects were randomized (stratified by age and body mass index [BMI]) to receive usual care alone (control) or usual care plus the promotora (intervention). Electronic medical record review assessed compliance with diabetes screening and referral for preventive or diabetes care by 18 weeks postpartum.

Of 142 women with GDM who delivered between July 2009- October 2010, 74% met inclusion criteria and of those that met inclusion criteria 88% of them were randomized to the promotora or control groups (n=47 each). The groups were similar in age, ethnicity, parity, education, and BMI. Relative to controls, women in the promotora group were more likely to complete diabetes screening visits [74% vs. 96%; relative risk [RR], 3.9; 95% Confidence Interval [CI], 1.1 – 14.1, p=0.04). Among women who completed diabetes screening visits, women in the promotora group were more likely to complete a subsequent referral visit for preventive or diabetes care (83% vs. 17%; RR, 4.0; 95% CI 2.1 – 7.4, p<0.01).

Participation of bilingual, bicultural community health workers can dramatically improve participation in postpartum glucose testing and referrals for diabetes prevention or treatment in Hispanic women with GDM.

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Category: Social Sciences
Name(s): Alyssa Min
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): David Kang, School of International Relations
Format: Analytical Paper
Title: Ethnic Korean Population in Japan: The Last Frontier?

Abstract:
The Democratic People’s Republic of Korea and the Republic of Korea, more commonly known as North Korea and South Korea, respectively, embody the last remaining remnants of the Cold War struggle. While direct interaction between the two states has been subject to much scrutiny and
analysis, this paper examines how geopolitical contestation between North and South Korea has played a role in the formation of identity and loyalties of the "Zainichi" ethnic Korean population in Japan, who trace their roots to the period of Japanese colonialism in Korea. I argue that the opportunity to influence this small but significant population has been utilized as an alternative channel through which both states can vie for its own modern diaspora community and advance its own version of the Korean identity. This paper also highlights the complexities of modern identity for the Zainichi Koreans, who live in tight-knit communities and have retained a strong sense of Korean nationality, despite their acclimation to Japanese society. To embrace their Korean heritage and identity, they have largely aligned themselves with one of two prominent alliance organizations: the pro-North Chongryon or the South-affiliated Mindan. Through its own representative groups, each state has sought to create a nostalgic memory for itself, one that has been deliberately constructed through various movements and campaigns, which I outline in my paper. Yet in the last decade, South and North involvement in the Zainichi population has waned since the two states have begun engaging in formal, inter-Korean dialogue; the creation of a new, evolving identity, straddling the Korean duality of Mindan and Chongryon and the Japanese features of societal upbringing, is also considered in the conclusion.

Title: Fighting for Uncle Sam
Name(s): Jenna Ross
Project Sponsor(s) and Collaborator(s): Philip Ethington, Department of History
Submission Type: Individual
Category: Social Sciences
Format: Senior Honors Thesis
Abstract: Despite the impact of the Vietnam War on the American national psyche, there exists a remarkable gap in its literature. Books have either focused on the foreign policy—efforts in trying to untangle why the war happened, and why it failed so badly—or on mere storytelling. Veterans tell their war experiences, and little effort is made to incorporate them into a broader understanding of the war. This study seeks to unify those literatures by examining approximately 1000 letters and uncovering the motivations for enlistment in the U.S. armed forces and determining to what extent foreign policy ideology and rhetoric impacted the men who actually deployed to Vietnam. The findings suggest that those men who chose to enlist in the military did in fact internalize the political ideology, and did so in three major ways: direct internalization of the justifications, cultural assimilation of political values, and familial pressure to accept that ideology. These letters show that the rhetoric of the Cold War created an environment in which young men felt obligated to participate in military service. The letters and the motivations they contain have significant implications for the study of the Vietnam War. They provide more nuanced insight into the men who fought the war, and how they processed that experience. It removes the soldier’s experience from the realm of stories and into academia.

Title: For Help or For Harm: Analyzing the Practices of Rehabilitation within California’s Juvenile Justice System
Name(s): Wanjiku (Ciku) Karanja
Project Sponsor(s) and Collaborator(s): Robin Kelley, American Studies and Ethnicity
Submission Type: Individual
Category: Social Sciences
Format: Creative Work
Title: For Help or For Harm: Analyzing the Practices of Rehabilitation within California’s Juvenile Justice System
Abstract: California’s Division of Juvenile Justice system, formerly known as the California
Youth Authority (CYA), has been running since 1941. CYA was founded with the intention to be "a model of juvenile justice based on rehabilitation instead of retributive punishment". During that time period rehabilitative structures had not yet been imagined. To this day California’s state facilities claim to be invested in that ideology, however over the past decade they have been watched by critical eyes for not providing proper protection, education, or mental health services that are essential for rehabilitating many of the wards they host. Such faults have resulted in various issues that make an initiative that was once considered dynamic and revolutionary now weak and ineffective. Currently, California’s Division of Juvenile Justice recidivism rate is approximately 70%. The fact that the young people within the system reenter at such a high rate is a reason for concern and much debate around the efficacy of California’s rehabilitation efforts. In this research I hope to gain an understanding of why the system is in its current state and what is needed to refocus energy to benefiting the youth the system serves.

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**Title:** Fostering Parental School Involvement: The Power of Labor Unions  
**Name(s):** Evelyn Larios  
**Project Sponsor(s) and Collaborator(s):** Veronica Terriquez, USC Department of Sociology  
**Format:** Field Research  
**Abstract:** Considerable research has looked at how well students fare in the U.S. education system. Therefore, less attention has been focused on parents and their involvement in schools. The research on parental involvement has assumed that parents are isolated people, who do not interact actively with institutions such as schools (Lareau 2000). Additionally, that compared to U.S. born parents, working-class and immigrant parents tend to participate less in their children’s schools. These parents often lack the cultural capital to intervene on behalf of their children (Lareau 2000) or they encounter language and institutional barriers that limit their involvement in schools (Turney and Kao 2009). However, research shows that organizations, such as labor unions, can provide working-class and immigrant parents with tools such as information, communication, problem-solving skills, and other civic skills (Putnam 2000; Wong 2006) needed to incorporate themselves in their children’s school. Therefore, through the use of both semi-structured interviews with union parents and survey data from the Los Angeles Parent Study this paper explore explores the relationship and role of organizational membership in shaping parental school involvement. First the survey data suggest that union parents are in fact, actively involved in their children education. Interviews, however demonstrated that not only did active union members, attend events, meeting or rallies sponsored by their union, incorporated the skills they learned from their unions in schools. But furthermore, among Latino immigrant union parents these skills help them navigate their childrens’ school systems by allowing them to overcome barriers that may have otherwise hindered their participation in schools.

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**Title:** Investigating Connectives in Children’s and Adults’ Narratives  
**Name(s):** Heidi Mettler  
**Project Sponsor(s) and Collaborator(s):** Elsi Kaiser, Linguistics  
**Format:** Laboratory-based Research  
**Abstract:** Understanding typical patterns of language
development is important for understanding language acquisition and for identifying instances of atypical language development, which can make earlier intervention possible. In my research project, I investigated the use of connectives in narratives, to learn more about what factors guide their acquisition.

Specifically, I investigated temporal (e.g. ‘while’, ‘then’), and causal connectives (e.g. ‘so’, ‘because’) in narratives by adults as well as 3, 4, 5 and 9-yr-olds (12 individuals in each group). These two classes of connectives differ in their lexical and semantic complexity. Temporal connectives are more complex in lexical terms, because there are simply more temporal connective forms in English. In contrast, causal connectives are more complex in semantic terms because they require a deeper understanding of the relationship between two events. I investigated how these two types of complexity influence the acquisition of connectives.

I analyzed connective use along two dimensions: token and type. Token represents the individual number of occurrences of any given connective; type represents the number of different individual connectives used.

The token frequency for temporal connectives increases steadily between 3-yr-olds and 5-yr-olds, then plateaus, suggesting that children learn the contexts in which temporal connectives can be used early on. Their type frequency remains relatively flat from ages 3 to 9, and we don’t see a clear frequency increase until adulthood, indicating that, on the whole, learning of new types of temporal connectives does not happen until later.

Causal connectives pattern differently, showing steady increases in both type and token frequency. This demonstrates that new contexts for causal connectives and new types of causal connectives are constantly being learned.

In determining patterns of normal acquisition of connectives, these data can also provide insight into diagnosing children with atypical language development.

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Category: Social Sciences
Name(s): Elizabeth Chabot
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Daryaneh Badaly, Psychology; David Schwartz, Psychology
Format: Laboratory-based Research
Title: Links between social status and romantic experience in adolescence: The moderating role of ethnic/racial background.

Abstract:
Several studies have documented an association between elevated levels of social status and involvement in romantic relationships. For instance, Miller and colleagues (2009) reported that adolescents with an elevated position in the peer group were more likely to enter into a romantic relationship than lower status peers. However, recent empirical evidence suggests that the association between social status and romantic involvement may differ for youths of different ethnic/racial backgrounds. Bouris and colleagues (2011) reported that the majority of Hispanic adolescents have been in a romantic relationship by the end of middle school, whereas Connoly and McIsaac (2009) found that Asian youths typically become involved in romantic relationships in late adolescence. Consequently, prior to late adolescence, social status may not be as potent a predictor of romantic involvement for Asian youths as for Hispanic adolescents.

To examine whether ethnic/racial background might moderate the link
between social status and romantic experience in mid adolescence, we recruited a sample of 369 ninth graders from a suburban high school in Southern California. Based on adolescents’ self-reports, 44 percent were Hispanic, 45 percent were Asian, and 11 percent were from other ethnic/racial backgrounds. Students completed group-administered questionnaires that included peer-nomination items assessing different dimensions of social status (i.e., social acceptance and popularity) and a self-report item querying romantic experience.

Multiple regression analyses did not reveal a significant relation between social acceptance and romantic involvement. However, results indicated that more popular youths had more romantic experience (p < .001). In addition, there was a significant interaction for popularity × ethnic/racial background (p < .05), such that the positive association between popularity and romantic experience was stronger for Hispanic youths (b = 0.17) than for Asian adolescents (b = 0.10). Future work may benefit from examining whether our cross-sectional findings replicate within a longitudinal design.

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Category: Social Sciences
Name(s): Alejandra Vargas-Johnson
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Veronica Terrizque, Sociology
Format: Senior Honors Thesis
Title: Mechanisms for college enrollment: The role of community based organizations in promoting college enrollment among undocumented youth

Abstract:
Scholars have identified challenges that undocumented Latinos encounter in educational institutions (Abrego & Gonzales 2010), yet they have largely ignored the pivotal role community-based organizations play supporting this growing population as it transitions into adulthood. In this study, I analyze survey data collected from youth in California to show that high school participation in community organizations is positively related to college enrollment for undocumented young adults. Results from semi-structured interviews with eight alumni of one Los Angeles social justice organization highlight the specific ways the social justice organization ameliorates the informational, social and financial barriers that undocumented students face when negotiating their postsecondary enrollment. Given the low postsecondary enrollment of undocumented young adults across the nation, this article isolates the social mechanisms that foster college enrollment among undocumented youth, thus informing initiatives that aim to promote college access for this population.

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Category: Social Sciences
Name(s): Nina Gertsvolf
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Bonnie Halpern-Felsher, UCSF Department of Pediatrics, Division of Adolescent Medicine; Heather Wipfli, USC Department of Preventive Medicine, Institute for Global Health
Format: Laboratory-based Research
Title: Mother-Daughter Discordance in Assessing the Quality of their Communication about Sexual Health and Sexuality

Abstract:
Objective: To examine mother-daughter discordance in their evaluation of general communication as well as communication about sexual health and sexuality.

Methods: Adolescent girls (N = 49; mean age 16.1 years [SD = 0.4]; 89% Caucasian; 35% sexually active) and their mothers
independently completed surveys designed to assess 7 areas of quality of mother-daughter communication about sexuality: dating/sexuality communication, general communication quality, affective responses to conversations, sharing information about free time, regretting communication with parents, range of sexuality topics discussed, and extent of parent monitoring.

Results: T-tests comparing mother and daughter responses indicated significant discordance in five of the seven variables (t's ranged from .31 to 8.29; p's ranged from .00 to .76). There was mother-daughter concordance on more concrete aspects of communication such as range of sexuality topics discussed and extent of parent monitoring. On all other variables, mothers perceived better communication compared to their daughters. Mothers (M = 3.41, SD = 0.40, p < .001) also reported a significantly more positive response to conversations about sex than did their daughters (M = 2.64, SD = 0.52). For example, in response to an item asking whether daughters would change the topic if mothers began talking about sex, 60% of daughters indicated that they would whereas no mother indicated knowledge that her daughter would try to do so.

Conclusion: This study revealed significant mother-daughter discordance in perceptions of their communication quality about sex. Mothers appeared to assume greater mutuality in communication than their daughters did. Future research should investigate the association between extent of parent-adolescent mutuality in communication and adolescents’ sexual behavior. This study has important implications for intervention efforts to improve parent-adolescent communication about sex. Specifically, parents may need to learn ways to better promote mutuality and perspective-taking in their communication with adolescents.

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Title: Neuroimaging of autobiographical self-perception
Name(s): Kimberly Berger
Submission Type: Individual
Project Sponsor(s) and Collaborator(s): Jonas Kaplan, Brain and Creativity Institute - Dornsife Neuroimaging Center
Format: Laboratory-based Research
Abstract: Previous brain imaging research has used standardized images of subjects’ faces as stimuli to invoke activation of self-related thought. Studies in autobiographical memory have also used fMRI to look at brain regions responsive to representations of self-related memories. The current study combines both research techniques to locate neural activation corresponding to autobiographical, self-reflective thought using natural, realistic stimuli. Images of participant-specific, recent autobiographical memories were presented during a whole-brain functional magnetic resonance imaging (fMRI) scan. Images controlling for familiarity, context of the memory, and visual stimulation were also included. Photos of participants and those of participants’ friends were obtained with permission from their Facebook profile. Naturalistic photographs of one’s self activated regions in the bilateral medial prefrontal cortex, right insula, right inferior temporal cortex, and bilateral striatum. Familiar other photographs activated regions in the bilateral medial prefrontal cortex and bilateral posterior midline cortex. Unfamiliar other photographs activated regions in the left insula, bilateral supplementary motor area, and bilateral sensorimotor cortex. These results suggest the medial prefrontal cortex is responsive to stimuli closely related to the self (including familiar others), and the posterior midline cortex is responsive only to familiar other stimuli.
Title: Peer Victimization Moderates the Heritability of Aggressive Behavior in Adolescents

Name(s): David Brega

Project Sponsor(s) and Collaborator(s): Laura Baker, Psychology

Submission Type: Individual

Abstract:
This study examined the genetic heritability and environmental contributions to the reactive, proactive, and relational subtypes of aggression, and the ways in which victimization experiences moderated these contributions. Specifically, Aggression and victimization were assessed in 496 twin pairs aged 14-17 using the Childhood Aggression Questionnaire and the Child Friendship Questionnaire. In reactive aggression, victimized males showed no difference in heritability as compared to non-victimized males, but victimized females showed lower heritability than non-victimized females. In proactive aggression, victimized males showed a lower heritability than non-victimized males, but victimized females showed a higher heritability than non-victimized females. In relational aggression, victimized males and females showed a higher heritability than non-victimized males and females. This research indicates that different intervention policies should be considered based on the type of aggression a person is exhibiting, whether or not they have been victimized, and their sex.

Title: Personal Bias and Decision Making

Name(s): Chela Limbrunner

Project Sponsor(s) and Collaborator(s): William Breland, Department of Psychology; Jo Ann Farver, Department of Psychology

Submission Type: Individual

Abstract:
Individuals generally rely on available information to make their decisions. They judge whether they favor one side of an argument over another based on what they know about the different sides of the argument. Their judgments are generally obtained via a heuristic balance of immediate information and prior beliefs. When two opposing positions regarding a topic are argued, one hopes that the stronger, more rational argument will be favored by any considerate judge who must choose between them. However, when the arguments are more or less equivalent in strength and rationale, what are the conditions or contexts that might influence which argument a judge chooses to endorse? The importance of this current study lies in gaining knowledge of how individuals make informed judgments about sensitive social issues. The current study instructed participants to ignore their prior beliefs and be impartial. This study examined whether individuals are actually able to suspend their own biases and arrive at impartial decisions.
Title: Predicting the Success of Community Based Resource Management Programs: Waihe‘e, Maui, Hawai‘i Case Study

Name(s): Mariah J Gill

Project Sponsor(s) and Collaborator(s): James Fawcett, Environmental Studies

Submission Type: Individual

Format: Field Research

Category: Social Sciences

Title: Predicting the Success of Community Based Resource Management Programs: Waihe‘e, Maui, Hawai‘i Case Study

Abstract:
Waihe‘e, Maui is one of the few regions left on the island of Maui that has most of the traditional Ahupua‘a land structure from ancient Hawaiian days left intact. The Ahupua‘a is a watershed that is managed from the mountain tip to the outer edge of the reef. Waihe‘e has the mountain area protected by state forest reserves and the coastal lands protected by the Hawaii Island Land Trust. This has left a small central area of residential area with a tight community and the reef unprotected. The objective of this study is to evaluate the potential that coastal and marine resources at Waihe‘e have for management by the community. This potential will be evaluated using a set of criteria synthesized from the work of other researchers.

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Title: Putting yourself in someone else’s shoes: Perspective-taking in an interactive task

Name(s): Evangeline Alva, Michal Meyers

Project Sponsor(s) and Collaborator(s): Elsi Kaiser, Linguistics

Submission Type: Group

Format: Laboratory-based Research

Category: Social Sciences

Title: Putting yourself in someone else’s shoes: Perspective-taking in an interactive task

Abstract:
Seeing the world from someone else’s perspective is a valuable skill humans must acquire as sociable, interactive beings. In everyday life, perspective-taking is important in linguistic communication, e.g. when giving directions. It is important to remember that the other person’s spatial perspective may not be the same as ours.

There are various kinds of perspective-taking; we focused on (i) concrete spatial viewpoint and (ii) abstract empathy. Spatial perspective-taking is needed in many situations, e.g. when facing someone and referring to an object next to us, my right is their left. Abstract empathy includes a person’s ability to perceive someone else’s viewpoint/opinion, to identify with others, and to empathize with others’ hardships.

We investigated whether a person’s ability to adopt another person’s perspective in an interactive, linguistic communication task is more closely correlated to concrete spatial perspective-taking skills or to abstract perspective-taking skills, or both.

Participants interacted with another person facing them, and took turns giving and following instructions (e.g. “The block is behind the giraffe”). We investigated whether participants arranged the objects according to their own perspective or the perspective of the instruction-giver. (Currently, we are also investigating pronouns and reflexives, e.g. “The giraffe is on the table, with the block behind him”). Participants also completed questionnaires measuring spatial and abstract perspective-taking abilities.

Our results so far point to a correlation between (a) perspective-taking in the object-arranging task and (b) abstract perspective-taking, specifically the ability/willingness to assume others’ viewpoints and to identify with fictional characters. Our results so far do not provide clear evidence of spatial perspective-taking skills correlating with the object-arranging task.

As a whole, our results suggest that the interpersonal, interactive nature of communication may be crucial for
perspective-taking, and have potentially interesting implications for more ‘impersonal’ forms of communication like email, calling and texting.

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**Category:** Social Sciences  
**Name(s):** Alexa Cohen  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):** Elsi Kaiser, Linguistics  
**Format:** Laboratory-based Research  
**Title:** Shifting Points of View: Effects of free indirect discourse and perspective-taking on pronoun interpretation

**Abstract:**
Free indirect discourse (FID) is a literary phenomenon characterized by the capacity to seamlessly shift perspective from narrator to character without explicitly reporting a change in speaker. Unlike direct speech (Mary said, “….”) and indirect speech (Mary said that…), FID presents a character’s speech/thoughts without quotes or embedded clauses (Mary stared mournfully at the monkeys in the cage. Why must they have such a desolate existence?!).

FID is associated with cues such as adverbials of doubt/certainty (e.g. perhaps, certainly) and emotive expressions (e.g. poor girl, that jerk). We investigated how these cues influence pronoun interpretation. If readers construe example (2) as FID, ‘he’ is interpreted differently than in (1):

(1) Mary looked woefully at Elizabeth. She was sick. (she = likely Mary)  
(2) Mary looked woefully at Elizabeth. Poor girl; she was sick. (she = Elizabeth)

Pronoun interpretation is a principal issue in psycholinguistics. Pronouns provide little information, yet humans interpret them efficiently and accurately. By investigating FID, we can gain insight into the coherence relations that affect language processing beyond syntactic salience. Because FID shifts point-of-view, our research has implications for perspective-taking. Previous research claims that assuming another’s perspective requires additional cognitive effort, predicting that FID cues may be ignored.

Participants completed a questionnaire with sentences similar to (1) and (2), and indicated the referent of the pronoun using a 6-point scale (1 = subject, 6 = object).

Our results so far suggest clear effects of FID. The mean score for sentences without FID differs significantly from those with FID, regardless of the specific cue; readers show sensitivity to a subtle, perspective-related cue in pronoun interpretation.

In future work, we plan to (i) investigate FID using on-line methodologies, and to (ii) test whether individuals’ non-linguistic perspective-taking abilities influence pronoun interpretation and capacity to recognize linguistic shifts in point-of-view.

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**Category:** Social Sciences  
**Name(s):** Ciarra Coleman, Jacqueline Day, Jennifer Stone  
**Submission Type:** Group  
**Project Sponsor(s) and Collaborator(s):** Roseann Giarrusso, Davis School of Gerontology; Merrill Silverstein, Davis School of Gerontology  
**Format:** Field Research  
**Title:** Stability and Change in Older Parent-Adult Child Relationships: Results from the Last Quarter of the 20th Century

**Abstract:**
Has the quality of the relationships between older parents and adult children changed over the last quarter of the 20th century? Based on the life course
perspective, socio-historical context and biographical change should influence how older parents relate to their adult children. We use data on older Anglo-American parents from the Longitudinal Study of Generations, a unique data set that allows us to compare the quality of the relationships of older parents with their adult children on six different dimensions of intergenerational solidarity for two cohorts of parents at two different historical periods: 1971 and 1997. Analyses reveal that the socio-historical context in which older parents and adult children interact influences the quality of those relationships. The results are discussed in terms of the life course theoretical perspective.

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Category: Social Sciences  
Name(s): Tyler Vestal  
Submission Type: Individual  
Project Sponsor(s) and Collaborator(s): Thomas D. Lyon, Gould School of Law  
Format: Senior Honors Thesis  
Title: The Accuracy of Pseudo-Temporal Questions in Interviews of Children

Abstract:
This study will examine children’s accuracy in response to pseudo-temporal questions asked during forensic interviews and in court. Pseudo-temporal questions are questions about an event modified by a prepositional location in time that expect a narrative response. When adults are asked these types of questions, they recognize the intent of the questioner and respond with a narrative because they generally rely on tonal cues. It’s expected that young children will not recognize tonal cues and will respond to the question with a temporal answer instead of a narrative. Furthermore, the garden-path effect suggests that children will make this error more often if the temporal word is used in the beginning of the sentence and is preceded by temporal questions. Two studies (transcripts from courtroom testimony and interviews) test these hypotheses. The first study examines trial transcripts of 80 felony child sexual abuse cases. The second study examines interview transcripts of 61 children suspected of being abused, in which children were systematically asked “how” questions regarding their reactions to abuse, thus controlling for the possibility that in the first study, children responded with more yes and no and less descriptive answers in general. The extent of this error and the implications for attorneys and interviewers will be discussed.

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Category: Social Sciences  
Name(s): Jaime Wu  
Submission Type: Individual  
Project Sponsor(s) and Collaborator(s): Jo Ann Farver, Psychology; Norman Miller, Psychology; Mayuko Onuki, Psychology  
Format: Senior Honors Thesis  
Title: The Black Sheep Effect: Effect of social categorization on the moderation of remorse

Abstract:
Unlike ingroup favoritism, which is a well-known strategy to achieve positive social identity, the black sheep effect is the phenomenon when ingroup members derogate and under-rate unlikeable ingroup members in order to maintain or protect one’s group identity. Previous studies have examined factors that moderated the black sheep effect, such as criminal history and guilt probability. This study investigates if the black sheep effect would still be triggered by the presence of a mitigating factor – the expression of remorse by the ingroup offender. It is hypothesized that expressing remorse, such as apologizing, should be regarded as a moderating factor. This study is applicable in areas such as jury decision making, and the results may contribute to understanding people’s judgments on
remorseful deviants based on their social categorizations.

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**Category:** Social Sciences  
**Name(s):** Kendra Keyse  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):** Norman Miller, Psychology Department  
**Format:** Senior Honors Thesis  
**Title:** The Effect of Disgust on Triggered Displaced Aggression

**Abstract:**  
The present study measured the effects of disgust on triggered displaced aggression (TDA). TDA has been defined as an instance when a person who was previously provoked shows an unmerited act of aggression towards a separate trivial trigger. A video served as a provocation, compared to an in-person provocation as was used in previous studies. Approximately 120 undergraduate students were recruited from the University of Southern California Psychology Subject Pool. No significant main effects or interaction between provocation and trigger was found as an indicator of aggression. Participants in the trigger condition showed slightly more aggression than in the no trigger condition whether they were previously provoked or not.

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**Category:** Social Sciences  
**Name(s):** Julie Guerin  
**Submission Type:** Individual  
**Project Sponsor(s) and Collaborator(s):** Jo Ann Farver, Psychology; Ann Renken, Psychology  
**Format:** Senior Honors Thesis  
**Title:** The Effect of Power Priming and Emotion-Related Words on Spatial Attention

**Abstract:**  
The effect of priming high power and low power states on sensitivity to subconscious emotional words was investigated. Eighty-one participants bisected strings of random letters into which fear, happy, and neutral words were embedded. Word strings without embedded words served as baseline and post-task measures of hemispheric activation; leftward bisection errors are indicative of right hemispheric activation, and rightward bisection errors are indicative of left hemispheric activation. Participants were randomly assigned to a writing task that primed either a high or low power state. A 2 x 5 mixed factorial ANOVA indicated an interaction between power priming group and type of word string. For the low power group, bisection did not differ from baseline to after the writing task. The high power group bisected further left on the post-task, indicating that high power activated the right hemisphere. The happy word strings recruited the left hemisphere in both power conditions. Fear and neutral words were associated with greater right hemisphere activation in the high power condition and greater left hemisphere activation in the low power condition. These findings suggest that high power may result in a more selective reaction to emotional stimuli than low power. Understanding the interaction between these variables can help elucidate how people respond to emotional stimuli in their environments as they experience fluctuations in a sense of power. The findings of this research have applications in business, film/television, advertising, and in spatial attention in every-day life.
Abstract:
This study examined the effects of avatar customization and point of view on psychophysiological, presence, self-presence, and self-reported valence and arousal responses. Twenty-three male participants played an online game with a customized avatar and an assigned avatar in the 1st and 3rd person point of view. Heart rate, skin conductance, and respiration data were recorded during gameplay and a presence, self-presence, and Self-Assessment Manikin questionnaire were given after each of the four gameplay sessions. The results showed significant time effects for Skin Conductance Level, Non-Specific Skin Conductance Response, and Respiration. There was a significant increase in respiration when participants played with customized avatars. Furthermore, there was an interaction for the avatar and point of view conditions, with customized avatars in the 1st point of view inducing the largest increase in respiration. Self-report measures of valence and arousal in relation to avatar and point of view were not significant. This study was a modified replication of one conducted by Lim and Reeves (2009). The results have educational and clinical implications, in addition to valuable knowledge for game developers.

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with Experiment 1. We found only a main effect for error rates. These results have significant implications for the admissibility of DNA matches that arise from database searches, and call for further research examining the rates of error in actual practice, an area that is largely understudied and highly controversial.

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**Title:** The Effects of Multiple Social Identities on the Psychological Well-Being of Youth at Risk for Street Gang Membership

**Name(s):** Madison Chase

**Project Sponsor(s) and Collaborator(s):**
Karen Hennigan, Psychology

**Submission Type:** Individual

**Format:** Senior Honors Thesis

**Abstract:**
Due to the pervasiveness of street gangs, a better understanding of the psychological dynamics of gang membership is both salient and necessary. Recent research in the psychology of gangs has shown that gangs are a source of social identity, especially for adolescents from disadvantaged backgrounds. This research examines the effects of multiple social identities on the psychological well-being of adolescents between the ages of 16 and 21 at risk for joining a street gang. Structured interviews asking participants about their different social groups were conducted. Social identity measures included harmony between multiple identities (measured by discrepancy between group norms) moderated by levels of importance of the identities to an individual (low, intermediate, and high self-investment). Initially the outcome variable, psychological well-being, included anxiety, stress, self-esteem, self-clarity and future expectation levels. It was hypothesized that youth with multiple convergent identities (high self-investment, low norm discrepancy) would show higher levels of overall psychological well-being, while those with multiple conflicting identities (high self-investment, high norm discrepancy) would show lower levels psychological well-being. Upon statistical analysis, no significant relationship was found between norm discrepancy moderated by self-investment, and psychological well-being. However, future expectations, as its own dependent variable, did show a significant negative relationship with norm discrepancy when self-investment levels are low. When group self-investment levels were high, expectations about the future also tended to be high, regardless of discrepancies in norms between groups. The results of this study can inform public policy by turning efforts towards prevention strategies, such as the fostering of multiple pro-social groups for adolescents to serve as protective factors against joining a street gang. As past intervention strategies have fallen short, it is clear that additional research on effective prevention policies may provide more promising results.

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**Title:** The Effects of Primed and Dispositional Attachment Styles on Complementary Projection

**Name(s):** Joanna Yau

**Project Sponsor(s) and Collaborator(s):**
Norman Miller, Psychology

**Submission Type:** Individual

**Format:** Senior Honors Thesis

**Abstract:**
This study examined the effect of primed and dispositional attachment styles on the tendency to engage in complementary projection- the process by which people attribute traits onto others to justify negative self-traits (e.g., projecting partner-secretiveness to justify self-prying). Both real and imaginary potential romantic partners were used as targets and the effect of primed styles was compared with
the effect of dispositional styles. We hypothesized that complementary projection would occur when targets were real partners and that securely primed individuals would be less likely to project because secure attachment is associated with positive self view and perception of others while insecure attachment is associated with negative self and/or partner perception. Lastly, a study showed that primed style overrides dispositional style in influencing individuals’ interpersonal expectations, leading us to assume that primed attachment would override the effect of dispositional attachment. 286 students were recruited from two Southern California universities (235 women and 49 men). For insecurely primed individuals in a relationship, self-prying tendencies were correlated with the perception of their partner’s secretiveness while self-secretive tendencies were correlated with the perception of their partner’s prying behavior, r = .43 and r = .45, p < .01 respectively. Securely primed individuals did not exhibit complementary projection. Individuals not in a relationship did not exhibit complementary projection. Individuals in a relationship and insecurely primed exhibited projection regardless of their dispositional style, while, with the exception of securely primed insecure individuals (whose tendency to engage in prying behaviors was correlated with perceptions of partner secretiveness), securely primed individuals did not engage in complementary projection, r = .54, p < .05. Thus while primed attachment style may weaken the tendency to engage in complementary projection, it does not override it completely. These patterns contribute to our understanding of the differences in perceiving relationships in relation to attachment styles.

---

**Title:** The Golden Horde and the Emergence of Muscovy

**Name(s):** Linda Dahl

**Submission Type:** Individual

**Project Sponsor(s) and Collaborator(s):**
Azade-Ayse Rorlich, History Department, Dana and David Dornsife College of Letters, Arts and Sciences

**Format:** Analytical Paper

**Category:** Social Sciences

**Abstract:**
When, in the 13th century, the Golden Horde emerged as a relatively autonomous segment of the Mongol Empire, among others, it included Russia, which at the time consisted of independent principalities. By the end of Mongol rule in 1480, the Russian principalities of the northeast had been brought under the control of Muscovy and the foundations of the early modern Russian state was taking shape. In this context, the impact of Mongol hegemony in Russia, however, has traditionally been discussed to highlight its negative outcome regarding Russia’s social, political and economic development. This paper attempts to identify the role Mongol domination may have played in forming the Russian state by raising question such as: “Which political strategies did Muscovite Grand princes employ?” and “What was the impact of Mongol rule on shaping Muscovite government and administration?” My analysis is informed by a review of the secondary sources, such as journal articles and monographs; while also drawing on primary sources that have been translated into English: including the Russian Chronicles and official documents issued by the Horde. After completing this project, I have arrived at the following conclusions: firstly, the Horde’s presence in the Russian lands made it possible for the Muscovite Grand Princes to engage in a political game that made possible Muscovy’s rise to power; and, secondly, that the Grand Princes of Muscovy adopted and adapted the government and administrative practices of the Golden Horde.
Horde to rule their own territories. Hence, considering the key role the Golden Horde played in the rise of Muscovy, I am challenging the literature that exclusively evaluates it in negative terms. In fact, I am arguing that without Mongol rule, Muscovy would probably never have emerged as the leading principality of the Russian lands, one that eventually became the nucleus of the centralized state.

§§§§

Title: The Parent-Child Relationship: Examining the Interaction Between Depressive and Anxiety Symptoms in Parents and Their Behavior Towards Youth

Name(s): Chelsea Massoud

Project Sponsor(s) and Collaborator(s): Gayla Margolin, USC Dornsife College of Letters, Arts and Sciences, Psychology Department; Michelle Ramos, USC Dornsife College of Letters, Arts and Sciences, Psychology Department

Submission Type: Individual

Abstract:
This study is a secondary data analysis of research collected from the USC Family Studies Project, a longitudinal study of a convenience sample of 180 families from the Los Angeles area. The purpose of this study is to analyze how parental psychopathology, specifically depression and anxiety as measured by the SCL-90, shapes the behavior that parents exhibit towards their children during a family conflict discussion. It is hypothesized that parents with higher scores on the Depression and Anxiety Dimensions of the SCL-90 will exhibit more negative behaviors (such as behavior withdrawal and criticism) and less positive behaviors (such as nonverbal displays of affection and support) toward the youth during this discussion. The interaction between symptomatology and youth gender in light of parental behavior is also explored. Noteworthy findings suggest that anxiety and depressive symptoms in mothers predict an increase in negative behavior and a decrease in positive behavior towards youth in both mothers and fathers, while symptomatology in fathers only significantly predicts his own behavioral withdrawal. Understanding the interpersonal nature of the family system, as well as its role in youth socialization, this study forwards several implications for healthy child development, family therapy, and prevention efforts.

§§§§

Title: Withdrawal Behavior as a Moderator between Family Aggression and Adolescent Depression

Name(s): Josephine Chou

Project Sponsor(s) and Collaborator(s): Gayla Margolin, Psychology Department of Dornsife College of Letters, Arts, and Sciences

Submission Type: Individual

Abstract:
While social withdrawal is characteristic of depressed adolescents, it is unknown whether withdrawal behavior (WB) is merely a consequence of depression or if it is an aggravating factor. Through a multi-measure, longitudinal approach, this study assessed whether withdrawal behavior moderates the effect of family aggression (FA) on the development of depressive symptoms in adolescents. Withdrawal behavior was operationalized using both a self-report measure (self-reported avoidant coping strategies) and behavioral measure (proportional talk time and talk turns relative to parents during a family conflict discussion when both parents were present). We found that withdrawal behavior and a history of family aggression were independently significant predictors
of depression ($\beta_{WB} = 0.31$, $p<0.01$; $\beta_{FA} = 0.29$, $p=0.01$). However, withdrawal behavior did not significantly modify the effect of family aggression on depression ($p>0.05$). Through a comparison of adolescents’ self-reported avoidant coping strategies at age 13 and speech behavior during a laboratory-based family conflict discussion conducted at age 15, we found neither the talk time nor the talk turn variables to be significant predictors of avoidant coping ($p>0.05$). However, talk time was a significant predictor of depression ($\beta = 0.29$; $p<0.05$). These findings indicate that talk time may be a useful tool for identifying youth at risk for depression. Depression was positively correlated with self-reported avoidant coping, but negatively correlated with talk time. Further research is needed to clarify this disparity.
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**Social Sciences**

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