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Poster Board No. 1

Parameterization of a Fractured Hardrock Aquifer in Western Foothills of the Sierra Nevada, California

Introduction. The Sierra Nevada foothill areas along the east side of California's Central Valley have experienced a continuous increase in population and land development activities. This has in turn put pressure on the local groundwater supply which is strongly controlled by the complex fracture hydrology of the region. Therefore, understanding how the ground water flows is essential for land use planning and water supply management. This study is aimed at characterizing the fractured granitic aquifer in the foothill areas of western Sierra Nevada, Madera County of California, and model parameterization to obtain the best values of hydraulic properties of the aquifer through long-term pumping tests.

Methodology. The hydraulic properties (transmissivity and storativity) were obtained by conducting pumping tests for 34 days, involving two test wells and 17 observation wells at a 540-acre study area. Results of three aquifer-test methods (step-drawdown, constant-discharge, and constant-drawdown) were analyzed. Results were examined in relation to the distributions and orientations of the fracture systems as observed on the surface by outcrop mapping and lineament studies using aerial photographs and Digital Elevation Model (ArcGIS). Two hypotheses (radial or linear flow patterns) were assumed and tested by evaluating these field experimental data.

Results and Conclusions. To characterize a large area of the fractured aquifer, a pumping test of at least 15 days is required to get a realistic trend line of drawdown versus time. Because of limited well capacities, constant-head pumping test methods have been found to be more practical than constant-discharge or step-drawdown methods. The results of different pumping test methods suggest that both the aquifer parameters (transmissivity and storativity) and the flow patterns (radial or linear) are scale-dependent, and the scale effect is related to the anisotropy controlled by the fracture orientation and connectivity independent of the test methods. The tests revealed that drawdowns at observation wells as far as 4,000 feet radius can still be influenced by linear flow intersecting the pumping well. Thus, model that assumed uniform aquifer properties can not be applied to the site, although some generalization can be made.

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Social Impact of Environmental Racism in the Outsourcing of E-waste in Africa and Asia

Environmental racism describes a society's intentional policies or actions that seek to dispose of its most harmful waste in areas populated by ethnic minorities or other disenfranchised groups. For centuries, minority groups and the poor in the United States have been the victims of hazardous waste disposal schemes, resulting in a disproportionably large number of Latinos and African-Americans living within two miles of one of more than 400 waste sites across the nation.

Nowadays, environmental racism plays an important role in the outsourcing of electronic waste (e-waste) into developing countries. Asia and Africa are quickly becoming the developed world's illegal dumping ground of choice for e-waste. Technology's rapid growth and the Western world's demand for the latest technology gadgets have caused 50 million tons of e-waste to be imported into developing countries each year—computers, fax machines, cell phones, and other electronic equipment.

Most of the e-waste being outsourced into developing countries is done illegally or by falsifying documents or by bribing officials. Although the demand for e-waste by e-waste brokers from developing countries is increasing at an astonishing rate, most of the e-waste shipped to developing countries is junk. The developing country's most vulnerable citizens tend to be the children and the poor who dismantle by hand the e-waste for less than $2 per day. This electronic equipment when dumped, leaches lead, mercury, and cadmium into the soil; when burned, it releases carcinogenic dioxins and polyaromatic hydrocarbons into the environment.

In the United States, activists are working to limit the flow of e-waste to developing countries through international agreements, such as the Basel Convention Treaty, and voluntary e-waste export reduction efforts. However, large e-waster producers, like the United States, have not signed the treaty.

Due to the lack of domestic and international laws or regulations, people in Asia and Africa continue to be the victims of the consequences of unregulated exposure to e-waste. The United Nations has called for Western countries to end the illegal dumping of e-waste into developing countries. It remains to be seen whether Western nations will fulfill and honor their international and moral obligations.

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Swiss Author Martin R. Dean's Novel Meine Väter Explores a Suppressed Multicultural Identity through the Search for an Unknown Father

My research focuses on Martin R. Dean's novel "Meine Väter" and his struggle with identity as well as the feelings of otherness in one's homeland. The protagonist comes from a multi-cultural family with his mother being Swiss and his father originating from Trinidad. Even though he considers himself Swiss, he is viewed differently by his community because of his outward appearance, mainly his darker skin tone. Furthermore, the author challenges the traditional view of what it is considered to be Swiss. My research will focus on his struggle of cultural duality as well as the ambivalence surrounding his search for identity and acceptance.

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Poster Board No. 4

Self-Efficacy Change is Associated With Better Quality of Life in Heart Failure Patients: A Quality Improvement Project Evaluating the Chronic Disease Self-Management Model in a Veteran Population

Background: Heart Failure (HF) occurs in 6-10% of people 65 years and older and is the leading cause of hospitalization in this group. Chronic disease self-management (CDSM) has become a priority in this large aging population with self-regulation accepted as beneficial in HF management. Clinical trials suggest that CDSM programs are more effective than information-only education and may improve quality of life. Self-efficacy or confidence to carry out a behavior necessary to reach a healthcare goal is central to the model.

Methods: Thirty-two male veterans (mean age 71 years) with HF in our Primary Care Clinic identified by chart review and physician referral were enrolled in a 4-session group clinic led by an interdisciplinary team consisting of a psychologist, a registered nurse, and internists over 8-weeks. Each session included one hour of education and development of self-management skills. CDSM skills over the four sessions included: monitoring weight gain/fluid retention, logging symptoms, medication adherence, diet/exercise, sodium reduction, energy conservation, and coping with emotional consequences of chronic disease. The second hour focused on active group discussion, patient goal setting, motivation enhancement, and a private consultation with a physician. Self-efficacy (SE) was measured by Self-Efficacy for Managing Chronic Disease 6-item scale and health-related quality of life (HQOL) was measured by Physical Component Score (PCS) and Mental Component Score (MCS) of SF-12 Health Survey both before (T1) and after the intervention (T2).

Results: Large effect relationships were observed between T1 SE and T1 PCS ($r=.58$, $p<.01$) and T1 MCS ($r = .62$, $p<.01$). Paired t-tests yielded significant change over time for SE ($t=-2.04$, $df=31$, $p=.05$; T1 SE, M=6.2, SD=2.59, T2 SE, M=7.0, SD=1.96) and for MCS ($t=-2.04$, $df=31$, $p=.05$; T1 MCS M=43.8, SD=13.39, T2 MCS M=48.4, SD=11.64). No significant change over time was present for PCS. Then, PCS and MCS were also evaluated via correlations using percent change variables. Results revealed relationships between percent change in SE with PCS ($r=.40$, $p=.02$), and MCS ($r=.62$, $p<.01$).

Conclusion: The increased SE and mental HQOL following interdisciplinary group intervention supported the self-management model in chronic HF treatment. Further examination of the role of depression in these relationships is warranted. Also changes in physical health-related outcomes following CDSM intervention require evaluation in larger samples and longer duration, and should include hospitalization rates and ER visits in controlled studies.

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Development of a Chronic Disease Self-Management Clinic for Heart Failure: A Quantitative and Qualitative Analysis of Patient and Caregiver Evaluations

Introduction: Heart Failure (HF) is the leading cause of hospitalization for people age 65+ (6-10%). About 6% of our patients are diagnosed with HF. VHA Clinical Practice Guidelines recommend education of patients/families, providing continuity of care via interdisciplinary disease management clinics. Chronic Disease Self-Management (CDSM) has become a priority in this aging population with self-regulation identified as good medicine. CDSM emphasizes interactive teaching, patient problem solving skills, an interdisciplinary team, patient goal setting, action plans, and support groups.

Methods: This quality improvement project describes development of our first CDSM clinic implemented in Primary Care for HF veterans and includes evaluation responses of patients and caregivers (n=33 patients; n=6 caregivers). Patients identified by chart review/physician referral enrolled in a 4-session 8-week clinic; caregiver attendance was encouraged. Interdisciplinary team included: Physician, Registered Nurse, Clinical Psychologist, Clinical Pharmacist, Dietician, Physical Therapist, and Social Worker. Each session included 1 hour of education and development of self-management skills. CDSM skills included monitoring weight, logging symptoms, medication adherence, diet/exercise, energy conservation, and coping with emotional consequences (depression/ anxiety), utilizing support groups, and completion of advance directives. Patients were provided tools to monitor/record symptoms and behavior change. The second hour focused on patient goal setting, motivation enhancement, and included vital signs and private consultation with a physician and pharmacist.

Results: Quantitative survey results yielded high satisfaction ratings. Participants rated how well the clinic met 6 core objectives (1=poor to 4=excellent) and rated the clinic overall (1=poor, 7=excellent). Mean results for patients and caregivers: 1.Increased HF knowledge, 3.6 ± .56; 3.8 ± .41; 2.Know when/how to contact PC team/emergency services, 3.5 ± .62; 3.8 ± .41; 3.Understanding importance of weight monitoring/med adherence, 3.7 ± .53; 4.0 ± 0.0; 4.Increased diet/nutrition knowledge, 3.5 ± .56; 3.7 ±.52; 5.Increased understanding of exercise and energy conservation, 3.5 ± .56; 3.7 ± .52; 6.Recognize depression/anxiety, 3.6 ± .55; 4.0 ± 0.0; Overall Rating, 6.6± .49; 7.0 ± 0.0. Qualitative analysis themes: Shared group sessions beneficial in decreasing fear, anxiety, and sense of isolation while building sense of community and support. Shared sessions helped patients move forward in accepting their disease.

Conclusions: Future research should include satisfaction ratings of providers since anecdotal evidence suggests CDSM gave providers a new context wherein they could build more "immediate" and meaningful professional relationships; evaluation of outcome data such as hospitalization/ER visits; and identification of more referral sources and methods to develop patient self-referral.

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The Link between Nutrition and Crohn's Disease

The focus of this review is to provide a basic understanding of inflammatory bowel disease (IBD) with special focus on Crohn's disease, its possible causes, symptoms, side effects and potential coping methods. About 500,000 of the American population is currently living with Crohn's disease, which means that 1 in 544 people are diagnosed with Crohn's disease in the U.S. alone (Cure Research, 2003). About 64 percent of patients who are diagnosed with Crohn's disease are hospitalized (Cure Research, 2003). As a result, it is critical for these individuals to know possible ways to improve their health and state of disease. Although it is extremely challenging to understand the nutritional effects on Crohn's disease, it must be examined in order to understand the alternatives to medication for the treatment of this specific disease. Due to the fact that many Crohn's patients do not understand the importance of nutrition and the role it plays in maintaining the disease, the main focus of this review is to present knowledge to the reader about the link between Crohn's disease and nutrition.

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Reservation Blues: A Novel of Historical Legacies

This paper examines the major themes Sherman Alexie addresses in his 1995 novel Reservation Blues: how, when, and why the Spokane Indians were placed on reservations; what treaties are and how they were not honored; how the history of the Indians in the nineteenth century affects Indians in the twentieth century. Sherman Alexie, a Coeur d'Alene/Spokane Indian, sets his novel on the Spokane reservation, and his central characters are members of an Indian band, Coyote Springs. While the band's career in the music industry is short-lived, it is through their dreams, journal writing, and story telling that the near genocide of the Spokane Indians emerges. Alexie uses the names of actual historical figures, such as George Armstrong Custer and Sheridan Wright, two men who were generals in the Indian Wars. The past historical events that the generals participated in are explored, as well as how the "generals" in the story perpetuate the pseudo-Indian cultiral, rather than physical, genocide. The essay explores why claiming to be Indian or part Indian has become popular, even while, in a double irony, the Indian who is thus co-opted is not Indian, but a fake stereotype. Finally, this essay identifies the factual references from the nineteenth century that Alexie weaves into the consciousness and subconsciousness of his characters and also the historical parallels between the Spokane Indians and other Indian Nations.

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Children's Practices in an Institutional Context

The objective of this study is to understand what messages the school as an institution conveys about other institutions to children and how those messages affect students' practices at school. A qualitative ethnographic study on approximately seventy-five students in K-4th grade of children five-ten years old and the director, nine teachers, and teacher's assistants 18-65 years old was done at the Astar School program in San Jose, California. Field-notes were taken for over twenty days between June 25 and August 24, 2007 in about ninety-three hours on normal daily behaviors in the classrooms, activities hall, black top, field and playgrounds outside, and bathrooms.

The results on Astar School include an analysis of how the school provides a set structure for students. Here, students are given choices which are controlled by the school institution and taught rules with the result of consequences or rewards. Appropriate behavior and how to mediate and solve problems can be seen in daily child-adult interactions. Encouragement, approval and attention are established with the use of certain tones of voice. Individualism is encouraged, protection and safety are important and an awareness of cleanliness and health are stressed. This institutional setting presents a mixture of ages and peer teachers that learn collaboration and group-work; indirectly their interactions also express influences of family.

Adult institutions are reflected in the Astar School through the use of language, messages on the ideal student, activities and environment of the school. Students receive acceptance if they conform. They also take in consistent direct messages such as courteousness and other complex messages indirectly. Here, imagination and creativity are encouraged within constraints. Children reflect those messages of societal norms through their behavior and thinking, but may not want to conform. Similar to adults, children are taught to conform in public, but may rebel certain rules privately.

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Young Voters' Evaluations of Presidential Candidates: Superficial or Substantive?

A general trend of voter apathy has raised concern in recent years. The group that exhibits the highest degree of political apathy consists of young voters. In the 2000 presidential election, only 36% of voters within the age range of 18-24 participated in the electoral process (Grant, 2004). Since young individuals are the most apathetic voting group, it seems likely that when they do choose to participate in the electoral process their decisions may be based on insufficient information. The diversity of the presidential candidates in this year's election presents new challenges for young voters regarding their political evaluations. The current study examined young voters' evaluations of presidential candidates based on two different types of characteristics. Superficial characteristics included ethnicity, age, gender, physical attractiveness, and religion. Substantive characteristics included stance on controversial issues, leadership ability, level of intelligence, and policy awareness. It was hypothesized that young voters (18-24 years of age) are more likely to evaluate presidential candidates using superficial than substantive characteristics.

Participants were recruited through the Psych 10 Experiment Participation System at CSU, Fresno. Students completed an online survey administered through the SONA system, which included questions regarding the demographics of the participants followed by scaled items in which the participants rated their likelihood of evaluating presidential candidates based on given characteristics.

The responses of 38 participants were statistically analyzed. A dependent samples t-test revealed that young voters are significantly more likely to evaluate presidential candidates based on substantive characteristics ($M = 25.53$, $SD = 4.04$) than superficial characteristics ($M = 15.39$, $SD = 5.47$), $t(35) = 8.38$, $p = .000$, $d = 1.4$. The results suggest that the tendency of young voters to focus on substantive characteristics will allow them to make informed political decisions in a presidential election.

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Radical-Radical Interaction

The purpose of our research is to synthesize, using a shorter scheme, a bis hydroxyl amine, 2,2-Pentamethylene-4,4,5,5-tetramethylimidazoline-1,3-bis hydroxyl, and oxidize it to the corresponding bis nitroxide radical (4). This radical has been probably reported but incompletely characterized. By synthesizing it, we hope to eventually learn more details about the radical-radical interactions, such as measuring the triplet-singlet gap. The reaction steps included synthesis of several compounds; 2,3-Dimethyl-2,3-dinitrobutane (1) was obtained through the oxidation of 2-nitropropane. 2,3-bis(hydroxylamino)-2,3-dimethylbutane (2) is to be made as a result of the reaction of zinc, ammonium chloride and dimethyldinitrobutane in tetrahydrofuran. The initial plan was to condense (2) with cyclohexanone to form 2,2-Pentamethylene-4,4,5,5-tetramethylimidazoline-1,3-bis hydroxyl (3), which in turn was expected to be oxidized with sodium periodate to give the 2,2-Pentamethylene-4,4,5,5 tetramethylimidazoline-1,1-dioxyl (4), the final radical. However, the condensation of (2) with cyclohexanone, resulted in the complete disappearance of cyclohexanone, yet (3) could not be found in the product. An alternative route involving the oxidation of 2, 2-Pentamethylene-4,4,5,5-tetramethylimidazoline (5) with dimethyl dioxirane is being explored.

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Detecting Genotoxicity in Pacifastacus leniusculus (Crayfish) Exposed to Polluted Sedimentsin Coyote Creek and the South San Francisco Bay

Xenobiotics such as organochlorine pesticides (OC), polychlorinated biphenyls (PCBs) and mercury, can greatly influence the biodiversity and balance of the aquatic habitats because of their toxicity. Coyote Creek in San Jose has the potential to accumulate xenobiotics. Crayfish are one of the organisms that are living in and are exposed to these contaminated environments. The comet and micronucleus assay were used to test for genotoxicity in four tissues types namely blood, gill, gut and liver. This paper presents the preliminary findings of the study. These findings will be used as baseline for other sites along the stream.

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Unmanned Aerial Vehicle for Precision Agriculture

The use of unmanned aerial vehicles (UAV) can provide useful data often in the form of digital images to many different users. Cattle location and range data can be easily collected with UAVs to assist ranch management. Agriculture can benefit from aerial photography in multiple ways. Remote sensing by UAVs can provide useful local site-specific data including crop scouting, geo-referencing, locating weed or pest outbreaks. UAVs can be used to quickly map the entire field and provide real time imagery data used to support management decisions.

A full size working craft will be constructed from balsa wood and plywood with an 8-pound empty weight. This UAV will carry 3 optical sensors 1 high-resolution still camera 1 high-resolution 1080i video camera and 1 small video camera that provides live feedback that can be used for flying the UAV manually. A Global Positioning Satellite (GPS) receiver will be carried by the plane and used to map the terrain. The GPS receiver will also be synchronized to the camera so each photo the camera takes will have corresponding GPS coordinates exactly locating the area show in the photo. An autonomous flight system to automatically guide the plane over a pre-programmed path is planned for this project as well.

Several test flights have been made and data has been collected at field 5 and field 9 located at California State University, Fresno, CA. Both GPS and video data were collected during these flights. The data provided useful information that could be used to guide management decisions.

Further testing and modification is required before full usefulness can be achieved. Autonomous navigation systems require further testing or need to be swapped for a more adequate system. When completed this UAV can be very useful in many applications.

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Learning and Choice Behavior in Siamese Fighting Fish

The majority of research on learning and choice behavior in animals uses nutritional rewards. In some cases, however, social contact can reinforce behavior. Male Siamese fighting fish (Betta splendens) will show aggressive displays when faced with another male – this they find rewarding. The question remains as to whether parameters of a social reward affect learning and choice behavior in the same ways as nutritional rewards. In this current study, we will present three experiments which investigate how social rewards in Siamese fighting fish affect choice behaviors in a T-maze with discrete trials. The first experiment (n=12) established fish can learn to make a choice that gives them visual access to another male for 20 sec. compared to the side of the T-maze which has no visual access to a male. The second and third experiments deal with what Hull (1943) called the "law of less work". He found rats would choose a side where they traveled a shorter distance to gain access to food. In the second experiment (n=10) we found, paradoxically, Siamese fighting fish will choose a side where they have to swim a greater distance to get visual access to another male. One possible explanation is, fish find swimming itself rewarding. So, the final experiment compared two groups (n=10 in each group) with different levels of deprivation to swim (half of the fish housed in large tanks and half of the fish housed in very small tanks). Again, we found a preference for swimming the greater distance to another male, but deprivation did not affect that level of preference. These experiments encourage further investigation into the nature of social rewards and learning.

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Parental Mental State Talk and the Development of Theory of Mind

How does children's theory of mind develop? Researchers like Perner, Ruffman, & Leekam (1994) and Wright Cassidy, Fineberg, Brown & Perkins (2005) believe that family dynamics are influential in the development of theory of mind in three ways. First, during family interactions children are exposed to conversation about theory of mind, which possibly leads them to think more about theory of mind phenomena. Second, these interactions give parents the opportunity to explain theory of mind phenomena. Finally, parents mediate conflicts between siblings during family interactions, addressing theory of mind issues that are immediately relevant to the child. Literature has suggested conversation effects on the development of children's social understanding, but the causality has been neglected. Three studies will investigate the effect of parental mental state talk on 38 to 43 month old children's theory of mind development. Study 1 attempts to determine if conversation has an impact on theory of mind. It's predicted that children who hear stories high in mental state talk will perform better on theory of mind tasks. Study 2 attempts to find which conversational devices are most effective in guiding children's theory of mind. It's predicted that children who are read picture books with cognitive talk will perform better on false belief tasks than children whose books contain talk about desires or feelings. Study 3 will investigate how much input is needed to see a measurable change in theory of mind. It's predicted that children who are read stories by their parents for 6 months will perform better on false belief tasks than children who are only read to for 1 of 3 months. These studies will benefit theory of mind literature by providing a window into the causal role of conversation in the development of theory of mind.

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Poster Board No. 15

Vertical Profiles of Ozone in an Urban Area during a Wildfire Event

We present the results of the data analysis based on vertical ozone profiles acquired in Fresno in the summer of 2007; during a period of unhealthy air quality caused by wildfire smoke. The analysis was done as part of the air quality study funded by the National Science Foundation (NSF) through the Major Research Instrumentation (MRI) Program. The data was collected using equipment setup consisting of an ozonesonde, a tethersonde, a balloon, an electric winch with tether, a laptop computer and a sounding processor made up of a radio receiver and transmitter. Variables measured include ozone concentration, wind speed and direction, water mixing ratio, relative humidity, potential temperature, and specific humidity. The data was analyzed to examine the evolution of ozone profiles and their impacts on air quality. The results showed that ozone buildup near the surface is related to turbulence intensity in the lower atmosphere. They also provide insight into the vertical transport of ozone in urban the environment; a knowledge that is critical for improving air quality forecasts for the region.

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Automated Identification of Flammable Liquid Residues In Fire Debris

When accelerants, such as gasoline, are used to start fires they often leave behind detectable residues in the fire debris. Chemists seek to identify these residues by: 1) removing the residue from the debris using passive headspace concentration, 2) analyzing the residue using gas chromatography – mass spectrometry (GC-MS), and 3) identifying the residue by manual comparison to a reference library of GC-MS data for known accelerant materials. A successful identification of an accelerant residue can be critical evidence in the prosecution of arson cases.

The identification of accelerant residues is challenging because of the variety and chemical complexity of the commercial products (e.g. gasoline, kerosene, diesel fuel, paint thinners, lamp oil, etc.) that may be used as accelerants and because of the changes that may occur to these materials during a fire. Computational approaches at automating the search process have not yet been successful in addressing these challenges.

Experienced fire debris analysts overcome these obstacles by focusing on unique, chemical characteristics or "signatures" of accelerants that will still be identifiable in the residue left after the fire. We will mimic this process by: 1) identifying numerical descriptions (metrics) of these signatures, 2) generating a library of the metrics for known products, and 3) using the metrics with statistical analysis techniques to group the unknown with the closest matching known product.

Early results have shown the ability of this approach to overcome the changes that occur due to evaporation in gasoline samples. Using less than 20 simple metrics we have been able to correctly identify a sample of gasoline that was greater than 95% evaporated.

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Ruthenium(II)-Catalyzed Asymmetric Transfer Hydrogenation of Aromatic Ketones Using a New Planar Chiral, Diferrocenyl Diaminodiphosphine Ligand

Ferrocene-based ligands with planar chirality have been shown to be effective in Ru(II)-catalyzed asymmetric transfer hydrogenation (ATH) of aromatic ketones. This reaction leads to the formation of enantiomerically-enriched chiral alcohols which are very useful synthetic intermediates that are utilized to prepare optically-active pharmaceuticals and other biologically-important compounds.

In regards to the ATH reaction, we have been able to successfully synthesize 2-diphenylphosphino ferrocenecarboxaldehyde (1) by utilizing a chiral auxiliary. The corresponding diimine (2) was prepared by the reaction of 1 with trans-(1R,2R)-diaminocyclohexane. The diimine 2 was then reduced with LiAlH4 to produce the diferrocenyl diaminodiphosphine ligand (3). Ligand 3 was characterized by NMR and IR spectroscopy, and by polarimetry. The Ru(II) complex 4 was obtained by the reaction of ligand 3 with the precursor complex [(DMSO)4RuCl2] in dry toluene. Complex 4 was then used as a pre-catalyst in the asymmetric transfer hydrogenation of various aromatic ketones. The results of our work on the synthesis, characterization, and catalytic studies will be presented.

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The Relationship between Extroversion/Introversion and Obsessive-Compulsive Symptoms

Obsessive-compulsive disorder and its symptoms have recently been receiving more attention in the last few decades. Although considered very rare as little as a century ago, it is estimated today that up to 20 percent of the population suffers from some for of obsessive-compulsive symptoms (Tallis, 1996). Past research has attempted to find out more about what causes such symptoms and if these symptoms are related to other mental disorders.

Research on symptoms of mental disorders in general has demonstrated that there may exist a relationship between disorders and/or symptoms and behavior. In addition, behavior has also been shown to be related to the personality of an individual. Therefore, it is very likely that because mental disorders are related to behavior, personality characteristics are also related to mental disorders.

The purpose of this study is to investigate the possibility of a relationship between specific personality characteristics and symptoms of mental disorders. More specifically, it is hypothesized that there is a significant negative relationship between levels of extraversion and expressed obsessive-compulsive (OC) symptoms. All participants completed a self-report questionnaire consisting of the Maudsley Obsessive Compulsive Inventory and the NEO Five-Factor Inventory. The results yielded a moderate negative correlation with regards to OC symptoms and extraversion. Implications of this study include an increased knowledge regarding how personality traits may influence (and potentially exacerbate) OC symptoms and disordered behavior.

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Relationships between Steroid Hormones and Aggression in the Clonal Mangrove Killifish,Krytolebias Marmoratus

Aggression is a valuable trait in the animal world. Mating, nest sites, social status and access to resources, such as food, can be decided through aggressive encounters. Krytolebias marmoratus is a self-fertilizing hermaphroditic fish with members of a clonal line being genetically identical to each other. We have shown in two previous trials that these killifish display a variety of aggressive behavior despite the lack of genetic variability. We investigated whether hormonal output could predict and/or respond to aggressive behavior exhibited by the killifish towards their mirror image, a stimulus known to evoke pronounced behavioral responses. We examined the stress hormone cortisol, and the sex hormone, testosterone, which in other studies have been shown to increase after an aggressive display.

We collected pre- and post-fight hormones using a non-invasive water-borne collection method. For each trial behavior and pre- and post- test hormones were evaluated during two fights that were conducted a week apart. Our preliminary results indicate that mirror induced aggression causes a reduction in both cortisol and testosterone, a unique finding in studies of this sort. We ran two trials, n=12, n=32, in which pre- and post- hormone levels were correlated to the behavior exhibited. Our results indicated that the fish were better able to correlate their endocrine response with their behavior in the second contest. Individuals with lower pre-fight cortisol levels were more aggressive. Testosterone levels were shown to rise sharply before the second fight, and this pre-fight increase predicted more aggressive displays and less strikes towards the mirror. The experiment that we present here is still under way, and is the last in a set of three trials; this final trial involved more animals, n=48, and was run with more stringent controls in an attempt to validate our original findings. The combined results of all three trials will be discussed.

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Does Challenging Convict Cichlids with ACTH Manipulate the Stress Axis?

Corticosteroids, secreted by the interrenal tissue of fishes, are steroid hormones that play an important role in maintaining equilibrium. Cortisol is the major hormone released in response to stress, and can vary in concentration when animals receive a physiological challenge. In this study, we challenged convict cichlids, Cryptoheros nigrofasciatus, by injecting them with different doses of adrenocorticotropic hormone (ACTH), which is secreted by the pituitary to stimulate stress hormone production. We evaluated whether ACTH challenge caused an interrenal hormonal response in the form of increase or decrease in the cortisol levels. In the five rounds of experiments that we conducted, 60 animals (12 animals per round) of approximately the same size were used; males and females were equally represented. The animals were acclimated to 37 liter tanks for five days, and then were habituated over four days to a beaker confinement procedure for collecting hormones. Cortisol was collected and extracted from fish holding water at different time intervals including pre-injection, and 2 h, 4h, and 24 h post injection. Blood also was collected at the 24 h time point. Preliminary analyses indicate that the low dose of ACTH brought about a significant increase in cortisol levels while medium and high doses resulted in a decrease in cortisol levels. These results suggest that exogenous ACTH was successful in manipulating the hypothalamic-pituitary-interrenal stress axis. While the low dose of ACTH stimulated cortisol secretion as expected, the medium and high doses perhaps triggered negative feedback regulation that caused a decrease in cortisol levels. Future work can include a study on how this manipulation can bring about differences in the behavior of these fish, and can provide insights into possible sex differences in stress responsiveness.

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Investigating Associative Connectivity of Cues for Unrelated Word Lists

Activating information in long-term memory implicitly activates associated information. Word list memory tasks have commonly been used to investigate the characteristics of these memory activation patterns. Although consistent impairment of memory for word lists has been shown during cued recall tasks, results have been mixed for word list tasks involving free or part-list cued recall. The current study is designed to clarify the role of associations in word list memory.

This study employs both free (Experiment 1) and part-list cued (Experiment 2) recall paradigms. Word lists have been designed to control for confounding word characteristics (e.g., frequency, concreteness, imageability). A within-subjects design implemented for both experiments reviews variations in associative set size, list length, connectivity, and cue type for all participants.

Results for the first experiment indicate a main effect for associative set size as well as a main effect for list length. The lack of an interaction between set size and list length suggests possible insufficient activation of implicit associative sets during free recall. Preliminary results for the second experiment suggest main effects for set size as well as cue type. Analyses to understand the effect of connectivity on word lists as well as the interaction of connectivity, associative set size, and cue type are still in progress. In conclusion, implicitly activated characteristics of word memory have varying impacts on memory impairment depending on the memory task at hand.

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Educational Efficacy of Applied Graduate Experience to Address Real World Problems

This evaluation study examined the educational efficacy of involving graduate students in the application of social psychology to address a real world problem. Specifically, graduate students (N=19: Females N=12; Males N=7) at California State University, Fresno enrolled in a Graduate Seminar in Applied Social Psychology were assigned to measure the value of earning an undergraduate degree in psychology as a term project. Students conducted an extensive literature review on alumni surveys for psychology majors. In addition, guest experts and stakeholders were invited to share relevant information related to survey design, alumni assessments, sampling, web surveys, statistical analyses, alumni communications, and evaluation. Students self-assigned themselves to teams and selected team leaders to accomplish the following tasks: questionnaire development, human subject approval, pilot survey, sampling, web design, alumni newsletter interface, data management and statistical analyses, and program evaluation. Students created a web-based alumni survey that would interface with the newly developed web alumni newsletter as a link on the CSU Fresno department of psychology web page. Students evaluated their engagement and learning in this applied process. Survey results of the formative evaluation suggest that students found this involvement in an applied project highly educational. Specifically, 83% reported, compared to traditional seminars, they spent more time engaged in this applied approach and that they learned new skills. In addition, 94% reported this was a challenging learning experience. Moreover, 78% reported that, based on this class experience, they would be able to effectively contribute to a professional project as an applied consultant. Finally, confidence in the effectiveness of applying social psychological theories to solve real world problems was reported by 100% of students that had been involved in this class experience.

Qualitative results showed students often reported they were challenged by tight timelines that required organization, delegation, collaboration, and time management. However, this experience ultimately strengthened their leadership skills and their ability to be effective team players/collaborators with people from different backgrounds. Detailed results of both the formative and summative evaluation of the web-based psychology alumni survey at CSU Fresno will be discussed in this poster presentation.

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Size-Segregated Measurements of Organic Compounds in Particulate Matter in the CentralValley

Particulate matter (or PM) consists of tiny solid and or liquid particles suspended in the air. It is widely believed that PM either exacerbates or causes a variety of adverse health effects including asthma, pulmonary disease and cardiovascular disease. A class of chemicals called quinones has been implicated in causing such health problems. Previous work in this lab has shown that levels of these chemicals are high in Central California.

In this work, levels of about seventy organic compounds (including quinones, polyaromatic hydrocarbons (PAHs), alkanes and carboxylic acids) were quantified in Fresno CA. Samples were collected at two sites using both Teflon filters and a Lundgren impactor during 2006 and 2007. Organics were then extracted and analyzed by gas chromatography-mass spectrometry. Method validation studies were also carried out to determine the uncertainties associated with the measurements made as well as the major sources of these uncertainties in the analytical methods.

Mass loadings of quinones are in good agreement with previous measurements in the region, with up to 70 % of the quinones found in fine PM. The measurements are consistent with traffic and wood burning as the predominant sources of these compounds.

The data suggest that the quinones are directly emitted into the air and that atmospheric oxidation of PAHs does not contribute significantly to the mass loadings of these compounds in the region.

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Informal Science Play: Comparing Systematic Comparisons in Dyads and Solo

This study investigates student interactions during informal science activities among different majors and science backgrounds. We are interested in whether students with science majors are more systematic and cooperative when engaging in an informal science activity. Participants were asked to interact with a partner to explore and test different cars. Each car contained three different car variables: shape of wheel, car length, and weight of the car. Students were encouraged to test for the distance and bumpiness of each car on a car ramp. In a second phase participants were separated and each participant was asked to individually test a new set of cars that only varied in the car's shape of wheel to compare the pair's interaction with individuals' exploration.

The degree of systematic testing was coded on a four-point scale, along with the frequency of note usage and who recorded the notes. Interaction between participants was also categorized into four categories; didactic, collaborative, modeling, and non-interactive. Of the four dyads currently examined, most interacted collaboratively: working together on the activity. Of the four dyads, three dyads were also extremely systematic in their comparisons where they tested each car multiple times. The one dyad using a different interaction style was composed of one science major and one non-science major, this dyad used a modeling interaction style with the science major taking the leading role. Individually, however, no one tested the new set of cars more than once suggesting that their individual exploration was less systematic than when comparing in a dyad.

These findings raise interesting questions that will be addressed in further work by increasing the number of participants examined and counter balancing order of the phases. These findings suggest that students do apply their scientific training to informal interactions at least in some cases.

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Identification of Two Mycobacterium Smegmatis Transposon Mutants Resistant to the Thiolcrosslinking Agent Diamide

M. smegmatis mutants were created by random insertion of the transposon EZ-Tn5 <KAN-2> and screened for growth on the thiol oxidizer, diamide, which creates disulfide bonds. By two-step arbitrary PCR, the flanking region of the transposon was cloned into plasmid pCR 2.1-TOPO, transformed into competent TOPO 10 cells and confirmed by restriction digest to contain the flanking region, and sequenced. In one such mutant, 274R1, the transposon disrupted an amino acid permease gene, likely involved in amino acid uptake from the surrounding media (233 bp into the 1347 bp gene, MSMEG_6727). It is possible that diamide may enter the cell by this transporter in wild type cells. In the second mutant, 198R1, the transposon disrupted a cobalt permease gene 260 bp into the 780 base pairs of MSMEG_2609. This gene is a part of the cbiMNQO operon that contain genes coding for cobalt and nickel permease subunits as well as genes involved in the synthesis of vitamin B-12, cobalamin. Lower levels of cellular cobalt may result in less oxidative stress due to a decrease in Co2+-catalyzed hydroxyl radical formation similar to the Fenton reaction catalyzed by iron. In both mutants, the phenotype has only been characterized as the ability to grow on diamide. The obvious next step would be to observe growth under normal conditions as well as increased cobalt, nickel, and amino acids and in the presence of other oxidative stresses. Ultimately, the mutant phenotype will be confirmed by reintroducing a functional gene copy into respective mutants and ascertaining if these strains display a wild type phenotype.

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Smog Chamber Studies of the Reactions of Butanal and Pentanal with Chlorine Atoms

Organic chemicals are emitted into the atmosphere in huge quantities both naturally and as a result of human activities. In the atmosphere, these compounds undergo a complex sequence of chemical reactions that can lead to the build-up of smog. The reaction products may also modify the physical properties of aerosol particles, affecting their ability to form clouds. This in turn may impact climate change. Understanding the atmospheric chemistry of organics is therefore crucial if these important issues are to be fully understood.

Aldehydes (such as butanal and pentanal) are important organic pollutants that are both directly emitted into the atmosphere as well as being intermediates formed in the atmospheric degradation of many other organics. However, published studies on the kinetics and mechanism of their reactions in the atmosphere do not agree well with each other. In this work, mixtures containing butanal (or pentanal), chlorine and nitrogen were photolyzed in a 140 L smog chamber, and changes in the composition of the chamber were monitored using Fourier Transform Infra-Red (FTIR) spectroscopy. Additional relative-rate experiments were carried out using mixtures that also contained a tracer compound (ethene or isopropanol).

High yields of acid chloride products (76 % and 69 % for butanal and pentanal, respectively) show that the chlorine atom predominantly abstracts a hydrogen atom from the acyl carbon atom. These measurements contradict an earlier study (Wu and Mu, Int. J. Chem. Kinet., 2007, 39, p168-174) which concluded that as little as 42 % of the chlorine atoms react in this way for butanal. The relative rate measurements reveal that the rate coefficient for the aldehyde + chlorine atom reaction lies at the lower end of the published literature values.

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The Relationship between Functional Outcome, Obesity and Radiographic Severity inPatients with Osteoarthritis of the Knee

Osteoarthritis (OA) is a major chronic disease leading to musculoskeletal morbidity and functional loss, its effects increasing with age. The individual with OA may experience pain, stiffness, and decreased range of motion (ROM), leading to loss of function in activities. The impact of obesity on function in patients with OA of the knee is not known. Clinical observation indicates that degree of obesity may have an equal or greater impact on function than the underlying anatomic severity of joint disease present. The purpose of this study is to determine the relationship between obesity and function in patients with OA of the knee.

A sample of convenience consisting of 41 subjects with a mean age of 66 years was used in this retrospective data analysis. A comprehensive clinical assessment was performed for self-reports of well being and physical outcomes measures. The severity of anatomic joint disease was scored using the Kellgren-Lawrence scale. The degree of obesity was determined using body mass index. Spearman rank correlation coefficients were run to assess relationships first between the magnitude of OA present to outcome measures, and then to assess relationships between the severity of obesity to outcome.

Correlational r values between BMI and self report and physical measures of function ranged from 0.21 to 0.34. While these correlations were low to moderate, they were stronger than correlations found between the severity of OA present to function.

This study indicates that in patients with OA of the knee, the level of obesity present has a greater influence on function and reports of well being than the severity of anatomic joint disease present. Weight management should be a critical rehabilitation goal when working to maintain and improve function in patients with OA of the knee.

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Explaining the Comorbidity of Intermittent Explosive Disorder and Depression

Intoduction. Current research shows that there is a relationship between major depressive episodes (MDE) and anger. Nevertheless, there is no research as to why this co morbidity occurs. Research indicates that people with MDE use anger-in strategies to express their anger. Research indicates that people with intermittent explosive disorder (IED) use anger-out strategies to express their anger. Finally, research indicates that people with MDE and IED use anger-out and anger-in strategies to express their anger. . In learned helplessness theory, a reaction of depression is caused by the lack of controllability of stress. Thus, we expected controllability of anger provoking situations would be an important factor in predicting anger expression scores in participants with MDE and in participants with IED and MDE. The first hypothesis is that controllability of situations would interact with diagnostic status to predict anger-in scores. The second hypothesis was that controllability of situations would not interact with diagnostic status to predict anger-out scores.

Method. We used 50 participants from the Anger Disorders Validity Study. Within the lifetime MDE (n=26) and the lifetime IED (n=14) participants, there were 7 MDE+IED participants.

Research participants completed Composite International Diagnostic Interview and a modified role-play interview about anger-provoking situations. The present study used 2 situations involving family members, a controllable situation (conversation with parents about changing a major) and an uncontrollable (early morning wake-up from father) situation. We tested our hypotheses with 2, 3 factor ANOVAs (MDE X IED X Situation) with repeated measures on the third factor.

Results. For anger-in, there was a significant situation main effect, with the uncontrollable situation eliciting higher levels of anger-in than the controllable situation. Also, there was a trend towards significance in the MDE by IED by Situation interaction with a diagnostic status interaction within the controllable situation (MDE participants had higher scores than MDE+IED participants) and an IED main effect within the uncontrollable situation. For anger-out, there was a significant MDE by IED by situation interaction. In the uncontrollable situation, the MDE group scored lower than the MDE+IED participants. In the controllable situation, the MDE participants scored higher than the MDE+IED participants. Results were partially consistent with the first hypothesis, but inconsistent with second hypothesis.

Conclusion. It seems that people with MDE and IED are more likely to have learned helplessness responses to controllable situations than to uncontrollable situations. The opposite is true of people with only MDE.

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Who do children trust?

Previous research in our lab suggests that conversation gives children important opportunities to learn. Chouinard (2007) found that children ask as many as 2 questions every three minutes of their parents, and Chouinard & Clark (2003) found parents give potentially useful feedback to children about the language errors they make. But are parents the only people that children trust for such information? Would children be just as willing to accept other addressees as sources of information? Corriveau & Harris (2006) found that 3- and 4-year-olds are more likely to display trust in a familiar informant rather than an unfamiliar adult in some situations. So, to understand the role that conversation plays in children's ability to learn about the world, we need a better understanding of what sorts of addressees children will use as sources of information. The present research examines how likely children are to ask question and accept feedback from a variety of addressees. We predict that children will be more likely to rely on parents for information than other addressees, and parents will be more responsive to children.

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Dual Detoxification of Mercury And 2, 4-D BY

Background: Soils contaminated with both metals and organics are difficult to remediate because of the divergent nature of the two contaminants. 2,4-D and mercury fall under this category of contaminants that are difficult to remediate. Both of these contaminants are found in high levels in soils all over the United States, specifically in California where Mercury contamination can be linked to mercury mines. 2-4D has been used extensively in pesticides control. Both of these contaminants pose serious health issues. To achieve a sustainable agricultural industry, it is necessary to understand the fate of chemicals that contaminate our soils so that land used for agricultural purposes is not limited due to contamination from metals and organics and to limit the exposure to the health risks. The aim of this project is to study the effects of heavy metal and pesticide contamination on catabolic pathways that microorganism use during bioremediation.
Methods: In order to find the minimum inhibitory concentration (MIC), 2 bacterial types which are Arthobacter fluorescens and Ralstonia eutropha (JMP134) are cultured on defined minimal media (M9) in both solid and liquid media and then analyzed. Both media are supplemental with either 2, 4-D, mercury chloride or both. After initial culture with a 5 day incubation period, both types of medium are analyzed for the inhibitory concentration. With the solid medium, the concentration at which there is no evidence of growth is considered as the MIC. For the analysis of the cultures in the liquid medium, cell density was measured using SoftMax Pro software (Molecular Devices, Sunnyvale, CA)
Results: In solid media, gram negative JMP had a MIC of 10mM 2,4-D and the gram positive Arthobacter had 9mM 2,4D. Media supplemented with mercury chloride showed 16 µM as MIC for JMP and 20 µM as MIC for Arthobacter. In combination, 6mM 2-4D and 8 µM mercury chloride was confirmed as the MIC for Arthobacter and 8mM 2,4-D and 10 µM mercury chloride as the MIC for JMP.
The results in liquid media are similar to those found in solid media but there is still further testing needed. For Arthobacter fluorescens that was only exposed to 2,4-D it was found that the 5th day reading compared to the first initial reading, the cell density reading had a low OD reading being below 0.6 with a concentration of 15mm of 2-4D. But when compared to the initial growth there was a significant jump. Ralstonia eutrophus yield better results with an OD reading between 0.2 and 0.3 with a concentration of 15mm 2-4D
Conclusions: Overall these results show that the bacteria are able to concomitantly detoxify both mercury chloride and 2, 4-D. However; when both mercury chloride and 2,4-D are combined, the MIC was much lower than the MIC for the individual toxins. Future research will study gene expression for genes needed for detoxification.

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A Report on Our Laparoscopic Surgery Experience at a Community Medical Center

Academic medical centers are supported for the advantages of multiple doctors covering the patients 24/7. This improves patient care. However, residents are suspected of having a higher operative death and complication rate than usual, especially with laparoscopic procedures.

Laparoscopic surgery has achieved increasing popularity. The purpose of this study was to review our laparoscopic surgery experience. We conducted a retrospective chart review on laparoscopic surgeries that were performed at UCSF- Fresno, California from 1/1/06 to 11/30/07. Charts were identified by CPT codes for laparoscopic cholecystectomy, laparoscopic appendectomy, laparoscopic hernia repair, laparoscopic colectomy and laparoscopic fundoplasty. Pre-operative risk factors were examined. Cases were followed up to 30 days to determine the rate of mortality and post operative complications.

There were 529 cases of laparoscopic cholecystectomies. The 30 day mortality (0.4%), infection rate (1.5%), respiratory occurrences (1.9%) and cardiac occurrences (0.2%) were the same as expected for their pre-op risk factors. 217 cases of laparoscopic appendectomies were performed. There were no deaths at 30 days. The wound infection rate was 6.5%. There were twelve cases of laparoscopic hernia performed, of which 1 case (8.3%) was a recurrent hernia repair while the remaining cases were initial hernia repair. There was no reported mortality at 30 days. The only complication was one unplanned intubation. There were 25 laparoscopic colectomies performed with 100% survival at 30 days. There were 2 cases (8%) of superficial incisional infection that were treated successfully with antibiotics. 7 cases of laparoscopic fundoplasty were done for gastroesophageal reflux disease +/- hiatal hernia. All patients were alive at 30 days. 1 patient remained intubated for >48 hours. Overall, our complication rates in the various types of laparoscopic surgery are comparable to the reported complication rates in the literature. In conclusion, laparoscopic surgeries were performed safely by residents at our institution.

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The Current State of Bilingual Education in Central Valley Preschools

This research seeks to better understand the current state of bilingual programs in Merced County and how these programs are incorporating current recommendations for effective bilingual education. The following two-studies involved approximately 600 surveys distributed to parents of Central Valley Kindergarteners and 33 surveys to all the preschool Administrators in Merced County. We predict the results of the current data received from the surveys so far, will indicate the overall availability of bilingual education in Merced County preschools, and parent perceptions of bilingual education, student and teacher demographics, and implementation of current recommendations. These findings will contribute to understanding how and what recommendations are being implemented in Central Valley preschools and will open the communication between researchers, parents, teachers, and administrators so we can provide future success in improving education and providing children with effective bilingual education. This type of assessment has yet to be done in Merced County and we hope to contribute to the growth of research in the success of bilingual education.

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Montreal Cognitive Assessment

This study explores the effectiveness of the Montreal Cognitive Assessment (MoCA; Nasreddine et al. 2005) as a superior cognitive screening tool to assist in making an earlier diagnosis of Alzheimer's disease. The patients' scores from the MoCA will be compared to the results of the Mini Mental State Exam (MMSE; Folstein et al., 1975), which is a commonly administered dementia screening instrument, in order to test whether the MoCA will be more sensitive than the MMSE in detecting cognitive impairments. The MoCA has already been shown to be an excellent screening tool when used to investigate mild cognitive impairment, but it might also be able to differentiate people with mild cognitive impairment from people with early dementia. Approximately sixty patients from the University of California San Francisco Fresno Alzheimer's and Memory Center will be administered the MoCA and the MMSE during their neurological visit. Each test will last about ten minutes, during which eight different cognitive domains will be assessed. The results of this study will be useful in determining whether the MoCA is a better screening option than the commonly used MMSE to increase detection of cognitive changes, resulting in earlier effective dementia diagnoses.

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Investigate the Effects of Glucose and Insulin on Glucose Metabolism, the GH/IGF-I axisand on GRLN Production in the tilapia

The growth hormone (GH)/insulin-like growth factor-I (IGF-I) axis regulates growth and metabolism in all vertebrates. Ghrelin (GRLN), a gut peptide, plays a role in regulating the GH/IGF-I axis and recent evidence indicates that it may be involved in glucose homeostasis. It is understood that glucose plays a central role in energy homeostasis and is tightly regulated by insulin in mammals. However, it is suggested that fish, in general, are glucose intolerant, but what is not clear is what role glucose and insulin play in the regulation of metabolism and growth in fish. This study was conducted to investigate the effects of glucose and insulin on glucose metabolism, the GH/IGF-I axis and on GRLN production in the tilapia (Oreochromis mossambicus). Male tilapia were given an initial IP insulin injection at one of 3 doses (0.1, 1, 10 U/gm), 16 hours later fish were injected again with insulin + glucose (1 mg/gm). Control fish received either saline or glucose alone. Samples were collected at 2, 4, 8, and 24 hours post 2nd injection. None of the doses of insulin tested had any effect on plasma glucose levels. Plasma GRLN levels appear to exhibit a temporal response to glucose treatment. At 4 hours, glucose increased plasma GRLN levels, whereas at 24 hours plasma GRLN levels were reduced. Insulin treatment recovered the inhibitory effect of glucose on plasma GRLN levels at 24 hours. Glucose and insulin had no clear effect on the GH/IGF-I axis. These data suggest that glucose and insulin play a role in regulating GRLN production and may influence GRLN's orexigenic and/or adipogenic actions.

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Verification of Visual Semiquantitaive Analysis of Plain Radiograph to Assess Outcome and Prognosis of Osteoporotic Vertebral Fractures

Vertebral fractures (VF) are the hallmark of osteoporosis. Studies have shown that the presence of VF is a key risk factor in predicting future fractures in spine / limbs. Evaluation of conventional lateral radiographs of the thoracolumbar spine is traditionally used for diagnosis of VF. However, there is no accepted radiological standard to predict subsequent outcome. The goals of this study were to 1) identify morphologic features of osteoporotic VF, 2) classify VF on serial radiographs by visual determination of the extent of vertebral height reduction and 3) predict the radiological outcome of VF using these measurements & features. This is a retrospective study that examined serial plain lateral radiographs of the
thoracolumbar spine of patients with osteoporotic vertebral fractures during 2000 to 2007.
The average follow up interval was 18 months. VF were graded according to Semiquantitative Visual Assessment of Osteoporotic Vertebral Fractures described by Genant, morphological Classification by Sugita and the existence of a Vacuum Cleft. A vacuum cleft is a transverse, linear or semilunar radiolucent shadow that is located centrally or adjacent to the endplate. It is caused by a vascular insult at the anterior segment of vertebral body and is highly suggestive of, although not specific for, osteonecrosis.
Our findings suggest that significant number of osteoporotic VF showed further collapse at 18mths. In particular, vertebral fracture at thoracolumbar junction showed significant height change at the same level although it did not predict collapse at other levels. Morphology suggestive of “Poor Prognosis”, namely swelled-front, bow-shaped or projecting types did not demonstrate significant height change at same level or other levels.

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A Randomized Experiment Comparing Random to Cutoff-Based Assignment

Previous studies have attempted to show that non-randomized experiments can approximate results from randomized experiments for testing effect of policy and practice in fields such as education, medicine, public health, job training, and psychology. Methods from these studies have compared results from randomized and non-randomized experiments, the latter usually subject to adjustments like econometric selection bias models or propensity score analysis. Several years ago, a laboratory analogue paradigm was developed to improve this design by randomly assigning participants to randomized or nonrandomized experiments in which they could choose their training or were otherwise treated identically. The current design follows that paradigm by randomizing participants into a Randomized Experiment or a Regression Discontinuity Design. Regression Discontinuity Designs are cut-off based designs which assign participants to a treatment dependent upon a single score on a pre-test.

The current study was hosted online, using human subject pools from the University of California, Merced and Southern Illinois University, Carbondale. Target sample size was 500 to ensure adequate power. Treatment consisted of two conditions: training in vocabulary and training in mathematics. Preliminary analyses indicate that Randomized Experiment vocabulary training significantly improves vocabulary post-test outcome, while mathematics training did not significant improve mathematics post-test outcome. Regression Discontinuity
Design showed a similar pattern. The vocabulary finding replicated previous studies, while the mathematics training did not. This prompted the distribution of a follow-up survey to explore reasons why math training did not influence mathematic outcome scores. Several predictors were significant in predicting outcome, including previous course work in the area of math and vocabulary. This study suggests that Regression Discontinuity Designs approximate the results of Randomized Experiments showing that these designs are effective and equivalent alternatives to Randomized Experiments.

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Poster Board No. 8

Validation of Rapid Stain Identification (RSID) Kits

Blood and semen stains are two of the most common fluids recovered from the scenes of violent crimes. Therefore, the forensic scientist must be able to identify these stains reliably, consistently and specifically. Presumptive tests for blood and semen are used widely throughout forensic laboratories to detect these fluids. Previous tests for these fluids were designed to detect hemoglobin in blood and P30 in semen, but they have specific drawbacks. Tests for hemoglobin in human blood have been shown to cross-react with the blood of other species (ferret, skunk, primate) and have a tendency to indicate false negatives due to a pronounced high dose hook effect. P30 tests for the detection of semen have specificity and sensitivity limitations as well. It has been shown that acid phosphatase activity is not confined to semen or prostatic tissue. Rather, it has been found to be present in amniotic fluid, breast milk, female serum, female urine and vaginal fluid. The tests for P30 can also be influenced by high dose hook effect.

Independent Forensics (IFI) has recently released RSID-Blood and RSID-Semen, which are new assays designed to detect blood and semen in a sample, respectively. IFI claims its new tests have higher specificity than older tests and do not give false negatives due to high dose hook effect. RSID-Blood kits are more specific than older tests because they detect for the red blood cell membrane antigen, glycophorine A, rather than hemoglobin. The RSID-Semen kits are also more specific than previous tests since they were designed to detect the presence of semenogelin which is a protein found only in seminal fluid. The purpose of this study was to validate the use of the RSID kits for forensic casework.

RSID-Blood and RSID-Semen kits were tested for specificity and sensitivity in accordance with the data presented by IFI in their developmental validation work. The sensitivity of RSID kits was tested with minimal concentrations of blood and semen as well as high concentrations at which false negative results might be given (due to high dose hook effect).

Next, specificity and mixture studies were performed to demonstrate that the presence of blood and/or semen were the only fluids that gave positive readings on the RSID test strips. RSID assays were also studied in order to determine the optimal time for a positive test to be determined, and to see if the recommended time for sample extraction could be shortened.

When the recommended procedure is followed, the RSID kits perform within manufacture specification. No false negatives resulted from high dose hook effect in either RSID-Blood or RSID-Semen assays. This study showed that the kits are specific to blood and semen when tested in the presence of other human tissue. RSID-Blood kits; however, show slight background signals for samples containing only urine.

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Poster Board No. 9

Toward Sustainable Agriculture and Improved Natural Resource Use in Senegal

Objective: The Republic of Senegal is a western African country with a gross domestic product of $24.54 billion and a GDP per capita of $1,700. Many of Senegal's farmers use traditional farming methods, causing inefficient land use and production. In addition, there is poor physical infrastructure surrounding its rivers, a major cause of a disastrous flood of the Senegal River in 1999. The flood not only caused substantial damage to the surrounding area and crops, but also several deaths. The "lack of adequate physical protection infrastructure" (Dia, 2004) is one of the reasons why this was such a large problem. This study proposes development methods that will improve Senegal's economy and make natural resource usage more efficient, and at the same time address the potential recurrence of this problem.

Methods: Data from Internet websites, books, and scholarly journals were collected to analyze several important characteristics of Senegal. Information analyzed included physical geography, climate, agriculture, food systems, and the economy. After being analyzed, the collected information was synthesized and then used to construct a development plan.

Results: Much of Senegal's grassy, flat land is used to raise animals. Only 11% of the land is used for crops, with 5% being irrigated. The average yearly rainfall ranges from 0 to 19.7 inches in the northern region to 49.2 to 98.4 inches in the southernmost areas. Flooding regularly occurs on the northern Senegal River and the southern Casamance River, which creates moist and fertile soil. The country's north must utilize the Senegal River's flood waters in order to produce crops on their land, assuming the events such as the 1999 Senegal River flood can be prevented.

Conclusion: We propose construction of safe and stable infrastructure around the Senegal River and its surrounding cities, including a series of dams, flood channels, reservoirs, and irrigation canals. Rain and river water should be collected and utilized by building water-holding and distribution facilities. In addition to utilization of water, new varieties of crops should be introduced to farmers in hopes of improving production and land use, providing more capital, and raising income of rural households. Safe and user-friendly methods of improving soil quality and preventing erosion can be introduced to the public as well. The cost of these activities would be approximately $2 billion. Although funding has yet to be identified, this project would bring substantial benefits to Senegal. It could also provide ancillary benefits to Mauritania, which lies north of the Senegal River.

ReferenceDia, Aliou Mamadou (2004). Use of Satellite Images to map Flood Extension around the City of Saint Louis in the Senegal River Estuary. International Flood Network Research Report. Accessed at: www.internationalfloodnetwork.org/AR2006/AR04Dia.pdf on 3/17/08.

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The Viability of Freeze-Dried ABI Identifiler Reaction Mix Preserved with Trehalose

Prior research by others has shown Trehalose to be an excellent preservative additive with the ability to preserve a myriad of biological substances and organisms. The object of this research is to freeze-dry and preserve in individual tubes, using the sugar Trehalose, all the reagents necessary to complete a polymerase chain reaction (PCR) using the Applied Biosystems Identifiler PCR kit.

A Labcono Freeze Dry System was utilized as the freeze-drying system for this series of experiments. Amplification was performed using an ABI 9700 Thermal Cycler, and short tandem repeat fragments were separated using the ABI 310 Genetic Analyzer.

The first experiment tested the effects of adding 10%, 15%, and 20% wt./vol. Trehalose to the PCR reaction mix without freeze drying. Results indicate the over-all quality of DNA profiles are not adversely affected by the addition of Trehalose. In the second experiment, reaction mixture that was 20% wt./vol. Trehalose was prepared and freeze-dried. Pre-loaded tubes were stored frozen, at room temperature, 50¢ªC, 60¢ªC and 90¢ªC for approximately 37 hours. Good quality DNA profiles are obtained when the pre-loaded tubes (20% wt./vol. Trehalose) are stored at room temperature for approximately 37 hours. Some preservation occurs at 50¢ªC, as indicated by partial DNA profiles. The third experiment is ongoing. Lyophilized reaction mix (20% wt./vol. Trehalose) is being stored frozen and at room temperature for up to six weeks. Samples are currently being collected and tested at two week intervals.

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Are Judgments of Improvement Accurate?

Students' judgments of their learning rate has been proposed as a possible metacognitive tool used in the allocation of study time. In this study, we investigated the accuracy of these judgments by asking students to estimate how much they improved between trials in a multi trial learning procedure. In experiment 1, we solicited judgments on a percentage scale, while in experiment 2, a 0 to 6 rating scale was used.

In both experiments, participants studied paragraphs of random words for six study-test cycles. After each study session, participants were asked to provide a judgment of learning (by estimating what percent of the paragraph they could recall), as well as how much they felt they improved since the last trial. They were then asked to recall the paragraph to the best of their ability.

In the first experiment, we found correlations between judged improvement and actual improvement to be quite small, at .187, while in experiment 2 there was no significant correlation. Correlations between judged improvement and the change in judgments of learning from one trial to the next were significantly larger than the correlations between judged improvement and actual improvement. Experiment 1 correlations between judged improvement and change in judgments of learning was .314, and experiment 2 correlations between judged improvement and change in judgments of learning was .335.

Results indicate that ability to judge improvement is very poor. The finding that correlations were larger between judged improvement and change in judgments of learning than the correlation between judged improvement and actual improvement suggests that participants were using their judgments of learning to estimate their improvement. This in turn suggests that students may not have access to their learning rate.

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A Visually Transcribed Lexicon

Spoken word recognition is defined as the process by which acoustic patterns are matched to semantic entries in the "mental lexicon" – the memory storehouse of information about the 85K+ words known by an adult language speaker. Previous research has demonstrated that the structure and content of the mental lexicon affect spoken word recognition. For example, computational analyses of the lexicon demonstrate that the number of acoustically similar "neighbors" to a given word changes from word to word and influences the ease with which that word is recognized in noisy conditions. Thus, when lexical variables (variables that quantify the structure and content of the mental lexicon) are unevenly distributed across the lexicon, behavioral effects are often observed.

However, speech recognition is not solely an auditory phenomenon: among other behavioral effects, the visual form of speech can be useful when lipreading. To date, very little work has been conducted to investigate the role of the mental lexicon in visual spoken word recognition. One problem that arises in visual speech recognition is that speech units that are acoustically different are visually identical. For example, the initial sound in the words "ban", "pan" and "man" look the same. Under lipreading conditions, then, there is literally no difference between these three words. That is, they form a visual Lexical Equivalence Class (LEC). The aim of our research was to investigate the distribution of several candidate lexical variables that arise uniquely under visual-only conditions. Using a lexical database of 19,308 words, we programmatically transcribed the words into lexical equivalence classes (LEC). We then looked for unevenly distributed variables by performing a computational analysis to identify the percentage of unique LECs and other structural relationships amongst LECs. The results can be used to predict the probability of correctly recognizing a word in visual-only speech perception and will be tested in follow-up behavioral experiments.

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Efficacy of HeartMath Intervention to Support Math Performance

The prevalence of math anxiety has shown to be a component of low performance in math students. Research on arousal and performance (Yerkes & Dodson, 1908), anxiety in athletic performance (Gucciardi & Dimmock, 2008), and math anxiety (Wigfield & Meece, 1988; Beilock et al., 2005) has provided a foundation for the development of general and math anxiety. Previous techniques used to reduce math anxiety (Pan & Tang, 2005; Strachan & Munroe-Chandler, 2006; Shobe et al., 2005; Ysseldyke & Bolt, 2007) have been conducted and used as effective interventions.

A select number of students in an experimental group (N=22) enrolled in an online remedial mathematics course at California State University, Fresno have been provided research and training on techniques developed by the Institute of HeartMath. These techniques have been tested at several universities and shown effective to reduce math anxiety and increase math performance in math students at various difficulty levels.

As mandated by the Chancellor of California State University and the Board of Trustees, using HeartMath to reduce the number of students requiring remediation and the experience of math anxiety will help improve math retention. As activists of this objective, our research and training has made an effort to address math anxiety and high remediation rates. In a collaborative study involving the CSU Chancellor, the Institute of HeartMath, and the Departments of Mathematics and Psychology at California State University, Fresno, we have helped to reduce math anxiety and improved performance in students requiring math remediation.

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Diamide Resistant Transposon Mutants in Mycobacterium smegmatis

Mycobacterium smegmatis is a model bacterium for the tuberculosis causing bacterium Mycobacterium tuberculosis. In order to study the oxidative stress defense mechanisms of mycobacteria, it is important to examine resistance to diamide since diamide oxidizes thiols which protect the bacterium against oxidative stress. This study examines three diamide resistant transposon mutants, 178, 183, and 197, of M. smegmatis. The mutation was identified by amplifying regions flanking the transposon using arbitrary PCR. Fragments of 600bp (197), 480bp (178), and 700bp (183) were amplified. The fragment was cloned into a PCR cloning plasmid, PCR 2.1, and transformed into E. coli to propogate the plasmid. Successfully transformed cells were grown, harvested, lysed, and the plasmid was extracted.
The plasmid DNA was digested with restriction enzymes to confirm cloning. The plasmids will be sent off to be sequenced. Once sequenced, the fragment will be compared to M. smegmatis genome sequence to identify the site of transposon insertion. Bioinformatic analysis will be performed to identify the disrupted gene. A native copy of the gene will be cloned and introduced into the mutant. This strain will be checked for diamide sensitivity to see if this gene is responsible for resistance to diamide in the mutants.

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Characterization of Diamide Resistant Mycobacterium Smegmatis Transposon Mutants 182 and 240

Mycobacterium smegmatis is a non-pathogenic relative of Mycobacterium tuberculosis, the causative agent of tuberculosis, that is frequently used to study the biochemistry of M. tuberculosis. A transposon mutant library of M. smegmatis was constructed and screened for mutants that are resistant to diamide, a thiol oxidant. Two of these diamide resistant mutants, 182 and 240, were further analyzed. The DNA flanking the transposon was amplified using two-step arbitrary PCR. The first step PCR uses a primer that binds to the end of the transposon and another degenerate primer that binds in the region flanking the transposon. A second round of arbitrary PCR is conducted with primers that are a subset of the original primers. The arbitrary PCR was able to amplify a 950 base pair DNA fragment for mutant 182 and a 300 base pair fragment for mutant 240. The mutants were later cloned via PCR cloning into the vector, pcr2.1. The presence of the cloned fragments was confirmed via restriction enzyme digestion with EcoRI. Then cloned fragments were sent for sequencing to determine the site of transposon insertion. The site of insertion for mutant 182 was at base pair 1516 of 2001 base pairs of MSMEG_6513, annotated as a membrane transport protein. The site of insertion for 240 was at base pair 2219 of 5004 base pairs of MSMEG_1254, a DEAD-DEAH box helicase involved in DNA metabolism and DNA replication, recombination, and repair. Next, wild-type copies of the disrupted genes will be expressed in the corresponding mutants to determine if complementation of diamide resistance will occur. Further studies will be done to determine the sensitivity of these mutants to various stressors, such as redox cycling agents, and the level of diamide resistance will be tested by subjecting them to increasing concentrations of diamide.

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Assessing Appearance Biases

These studies are part of an effort to calibrate the Implicit Association Test (IAT) as a tool for eliciting unconscious biases elicited by facial features. Evidence suggests that perceptual cues available in facial appearance powerfully, yet implicitly, elicit expectations about qualities and characteristics of others. We are adapting the IAT for use in a research program designed to explore the extent to which unconscious appearance biases can be modified. In our application of the test, participants see photographs of children who differ on a dimension of appearance such as attractiveness, age appearance, or gender. They are asked to pair the photographs with words that are consistent or inconsistent with the appearance dimension, and the time it takes to make the pairing is recorded. Participants decide for themselves whether a child looks masculine or feminine, older or younger, more or less attractive. Results show that participants take significantly longer to associate words and pictures that are inconsistent with the bias relative to words and pictures that are bias consistent. For example, participants take longer to associate words such as naïve or innocent with faces of children who look relatively old for their age compared children who look even slightly younger. Using the IAT, we have demonstrated attractiveness, age appearance, and gender appearance biases. In initial tests, the appearance differences among the stimulus children are subtle. This resulted in high levels of classification error, with some participants classifying particular stimulus children in a different way than others do (e.g., consistently classifying a child as looking young even when others typically classify that child as older-looking). We are now exploring ways to remedy this reliability issue. Overall, however, the IAT appears to offer a quick method of eliciting appearance biases, making it a valuable took for evaluating the effectiveness of bias change strategies.

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Couple Relationship Characteristics and its Association to Attachment Styles

The purpose of this current study is to consider the effects of attachment of both individuals in a romantic relationship on relationship characteristics, including relationship strategies (use of ideas and skills to enhance the relationship), relationship effort (persistence in using ideas and skills to enhance relationship), relationship satisfaction, and communication styles.
A major problem with most of these previous research is that they consider the individual and their perception of the relationship without considering the other partner and their influence on the relationship. Feeney, Noller, and Roberts (1999) emphasize the need to consider both partners' attachment styles on such things as partner matching and relationship functioning. This preliminary study is an attempt to explore this area further.

There were 13 heterosexual couples that were recruited through a convenience sample. The majority were White and about half the sample was married and the other half, in a steady relationship or engaged. Both individuals in the relationship were administered separate questionnaires utilizing the RELATE Scale (Busby, Holman, & Taniguchi, 2001) to assess relationship characteristics and the Relationship Style Questionnaire (Griffin & Bartholomew, 1994) to assess attachment style.

The results showed complementary pattern pairings between preoccupied individuals with dismissing avoidant individuals and similarity pattern pairings between fearful individuals. Fearful men and women show an expected pattern of behavior that suggests high anxiety and avoidance (e.g. not sending clear messages, feeling overwhelmed, etc.). Preoccupied men seemed engaged in their relationship, whereas preoccupied women were disengaged (withdrawing, being critical).

The results do provide some further support for previous research that individuals with similar attachments do tend to be in romantic relationship as well as complementary patterns between avoidant and anxious styles. Fearful men and women show an expected pattern of behavior that suggests high anxiety and avoidance (e.g. not sending clear messages, feeling overwhelmed, etc.).

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Critical Thinking in Today's High Schools: A Case Study of California Schools

The purpose of this study was to examine if high schools in the state of California are teaching critical thinking skills necessary for success in college through Ivie's Survey of Critical Thinking (ISCT). Secondly, the study was interested in the validity of ISCT by including a measure of critical thinking disposition and a measure of critical thinking ability to the original survey. Data collected was compared with two other measures: an abridged version of the California Critical Thinking Skills Test (CCTST) and the Critical Thinking Motivation and Dispositions Survey (CTMDS). Ultimately, the study addressed four questions: (1) Are students reporting that they are learning critical thinking skills in high school? (2) Is there a difference in scores on the three measures between students who attended different types of high schools (e.g., separate districts, school size, average class size, as well as other classifications)? (3) Are there any other demographic information differences in how much of the critical thinking skills they have learned? And (4) is the data consistent between the ISCT, CCTST, and CTMDS?

Three-hundred and fifty students were recruited for this study from California State University, Fresno (CSUF). Participants were obtained from introductory psychology and introductory statistics courses. Participants completed the ISCT, CTMDS, CCTST and a demographics survey.

Students reported learning adequate critical thinking skills. Ivie's High School Critical Thinking, the CCTST and the CTMDS were unable to be significantly predicted by school district, average class size, teacher-student ratio, student-computer ratio, state ranking of the school, or geographic region within California. There was no significant difference in critical thinking scores based on demographics such as gender or parental schooling levels.

Though a wide variety of students were surveyed, this study was limited in obtaining enough students to adequately represent the array of high schools in California.

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How Fish Turn – an Experimental Study of Motion Patterns

Most bony fish bend their body to change swimming direction. A change in direction constitutes an angular acceleration and therefore requires a turning force, otherwise the fish will slow down. Previous studies have shown that high-bodied fish achieve higher linear accelerations than shallow body morphs (Domenici et al., 2008, Proc. R. Soc. Lond B 275, 195-201). In this study, we will focus on high-bodied fish to establish whether they also excel at angular acceleration, in particular, whether they can turn without slowing down. To this end, we need to trace the speed and acceleration of the fish's center of mass during a turn. First, we need to determine the position of the fish's center of mass. We make plaster casts of the fish, cut the cast into 5 mm sections, and determine the cross sectional shape and area, and then integrate these values along the fish's body axis. We then record turning fish with two high-speed cameras from a ventral and a lateral point of view. We use custom-made software to detect the fish in each image and to analyse its movements. From the ventral images, we extract swimming speed and direction, and we establish if and when during the turn the fish slows down. The ventral images also allow us to quantify how the fish alters its body wave before, during, and after the turn. We trace the fins in the ventral and lateral views to explore the role of fins in powering and steering a fish through a turn. We predict that fish accelerate their body wave to generate the extra force to power turning and to avoid slowing down during turns. In the next step of our analysis, we will combine the shape of the ventral outline with the three-dimensional shape data to reconstruct the position of the center of mass. The trajectory of the center of mass will then tell us whether fish can turn without slowing down.

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Factors Impacting Final Discharge Disposition After Hip Fracture in Individuals 60 Years and Over

The National Center for Health Statistics reported 309,500 hospitalizations due to hip fractures in individuals aged 65 years or older in 2003. Only half of older adults with a hip fracture will return to the community, and only one-third will regain their pre-fracture level of function. The direct cost associated with hip fractures in older adults is currently estimated to be $19 billion annually in the United States. The purpose of this study is to examine differences in discharge disposition between two surgical alternatives for hip fracture repair, arthroplasty and open reduction and internal fixation (ORIF).

A retrospective medical record review was carried out for individuals admitted to one skilled nursing facility in 2007. Ambulatory individuals 60 years or older with hip fracture who underwent surgical repair of arthroplasty or ORIF were included in this study. Exclusion criteria included living in a nursing home pre-fracture, or individuals with revision hip surgery.

Thirty-four records reviewed to date met the inclusion criteria. The arthroplasty group of 21 patients was compared with the ORIF group of 13 patients. At this time, there appears to be a difference in final discharge disposition between groups. Pre-fracture, 71% of the ORIF group and 62% of the arthroplasty group lived at home. Following rehabilitation for hip fracture, 62% of patients in the ORIF group went home compared to only 38% in the arthroplasty group. Individuals with arthroplasty were six times more likely than those with ORIF to have the final discharge disposition of a nursing home.

Results at this time indicate that individuals with ORIF repair have a higher likelihood to return home and a lower likelihood of requiring nursing home care following rehabilitation than those who undergo arthroplasty repair. This is significant considering the increased costs incurred for nursing home care compared to returning home.

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Synthesis, Recrystallization, and Oxygenation of Bis(O-ethyl-L-cysteinato)nickel(II)

Bis(O-ethyl-L-cysteinato)nickel(II), which is more conveniently named (cysE)2Ni, was synthesized and characterized as part of a larger study that is trying to understand the mode of action in which metals replace zinc in zinc fingers. Zinc fingers are involved in the transcription of DNA. Displacement of zinc with other metals can lead to toxic effects. When carefully controlled, these toxic effects can be used to kill cancer cells. The (cysE)2Ni complex is a control for our model studies where nickel replaces the zinc in bis(O-ethyl-L-cysteinato)zinc(II). During the synthesis of (cysE)2Ni, we were able to improve the formation of crystalline product by controlling the rate of stirring and the rate at which nickel is added to the cysteine ligand. The product was characterized by Infrared Spectroscopy, Proton Nuclear Magnetic Resonance, and Electronic Spectroscopy. We will present the structural data obtained from X-ray crystallography as well. When dissolved in methanol, the green (cysE)2Ni makes a pink solution. Exposure of the pink (cysE)2Ni solution to oxygen results in a darker red color. This change in color indicates a reaction takes place. These color changes can be better analyzed by electronic spectroscopy. The differences in the electronic spectra of the starting materials and the oxygenated products show the absorption at 485 nm has intensified and red-shifted slightly. In addition, a more distinct shoulder develops at 385 nm when the solution has been exposed to oxygen for 1.25 hours and longer. Comparisons to literature values suggest the spectral changes are a result of the formation of a trimetallic species. There were also changes in the infrared spectrum.

The oxygenated spectrum develops shoulders on the doublet at ~1230 cm-1 where there is a "sharp" doublet in the control spectrum. Additionally, there appears to be a formation of a new peak at ~1010 cm-1 in the oxygenated spectrum where there is a single peak in the control spectrum. These differences allude to the oxidation of the sulfur groups on (cysE)2Ni to create sulfones. This is plausible because transition metal thiolates have a tendency to form metallosulfones when exposed to oxygen. Data from the electronic and infrared spectra lead us to conclude that the oxygenation of (cysE)2Ni results in a mixture of products: sulfones and a trimetallic.

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Pre-Admission Factors as Predictors for Success in a Master of Physical Therapy Program

The Master of Physical Therapy (MPT) program at California State University, Fresno, uses a variety of pre-admission factors in order to determine acceptance into its rigorous program. The purpose of this study was to identify the best predictors for academic and professional success in the MPT Program in order to decrease time and resources required by faculty in the admissions process.

Three years of retrospective admission and program data were obtained from a sample of convenience of 100 student records. Included in the data were pre-admission grade point average(pGPA), Graduate Record Examination (GRE) scores, pre-requisite observation hours, MPT GPA, program comprehensive examination scores (CES) requiring a passing grade in the final MPT year in order to graduate, total admission score (TAS), a computed sum of 40% pGPA, 40% interview score and 20% average GRE, and National Physical Therapy Examination (NPTE) scores. Academic success was defined as the MPT GPA whereas the professional success was defined as NPTE scores.

Stepwise regression models indicated the comprehensive examination score and first year MPT GPA predicted 79% of the professional success for the NPTE scores (R=.888, R2=.788). Additionally, the total admission score and pGPA predicted 46% of the academic success, for the MPT GPA (R=.674, R2=.455).

Our results suggest that pGPA and TAS could effectively predict student academic success in the MPT program. Student CES and first year MPT GPA could predict NPTE performance. Our department might continue focusing on the applicant pGPA score and TAS to assure student success in the MPT program as well as future professional success.

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Parent-Child Interactions and Note-Keeping during Science Play

The current study examines the way that parent-child interactions influence children's science learning during informal science activities. Previous research suggests that parents often facilitate problem solving-activities by recording data while their child manipulates the materials (Gleason & Schauble, 1999). The current study further examines this role by recruiting thirty sets of parents with their children (ages 7-10) to engage in an activity together to test cars with multiple variables, and have the opportunity to record the results of their trails. After, the child tests and records their results for a new sets of cars independently to look at the way the dyad's interaction influences the child's trails.

Parent-child interactions will be coded and categorized into four categories: didactic, modeling, collaborative, and non-engaging. Data analysis will also included coding dimensions of systematic testing of cars and frequency of note taking on a four point scale. We are currently collecting data, and anticipate having results from 10-15 participants by the time of presentation.

Pending data analysis, it is expected that parents that use more didactic and modeling interactions with their children will be correlated with children's frequent use of systematic car testing and recording their results in independent trials. Children of these parents are also expected to generalize the use of recording trials, and show understanding of the effects of car variables on a post-test.

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Paraneoplastic Syndromes Presenting with Depression and Psychosis: Two Case Studies

Introduction: Isolated personality changes, depression, dementia and frank psychosis, often common manifestations of new-onset psychiatric disorders, may be associated with limbic and brainstem involvement in paraneoplastic syndromes.

Methods: Two distinct patients with depression and psychosis who received primarily psychiatric intervention initially, with subsequent atypical responses to treatment, are examined.

Results: Two patients with paraneoplastic syndromes, presenting primarily with psychiatric symptomatology, received considerable psychiatric care with poor response to treatment. Ultimately, paraneoplastic syndromes were considered as potential causal entities. In both cases, extensive antibody testing, CSF analysis, and cranial imaging were required to make the diagnosis. Treatment in one case consisted of tumor excision, while in the other, a tumor has not been found. However, a combination of steroids, plasmapheresis, and IVIG has returned the latter patient to near baseline cognitive function and improved the patient's mental health, though these procedures have been required on a continuing basis to maintain the patient at baseline.

Conclusion: The diagnosis of paraneoplastic syndrome should form part of the differential in all patients with sudden or new-onset psychiatric illness; otherwise, it may be missed as it poses a significant diagnostic challenge because the symptoms are likely to be inconsistent from one patient to the next and are frequently unrelated to the primary tumor which may not be discovered for months to years. In addition, though the literature has traditionally indicated that typical antibodies such as the anti-Hu and anti-Ma are associated with malignancies, it is becoming increasingly clear that perhaps an equal number of limbic encephalitides are the result of antibodies, such as anti-NMDR, which lack associations with cancer and respond more readily than true paraneoplastic syndromes to plasmapheresis and IVIG.

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Case Report : Diverticulitis with Intramural Abscess

We present a case of a 51-year-old man who was admitted to Community Regional Medical Center, Fresno in March 2008 for evaluation and treatment of three day history of abdominal pain. Patient had history of colon cancer underwent lower anterior resection in December 2005, diabetes, hypertension and asthma. Admission CT showed a short segment of sigmoid colon with diverticulitis with intramural abscess. Presence of free air and fluid indicated probable perforation. Patient was given IV antibiotics and managed medically and improved.

Acute diverticulitis is a disease with a wide clinical spectrum, ranging from a phelgmon (stage Ia) to localized abscesses (stages Ib, II) to free perforation with purulent (stage III) or feculent peritonitis (stage IV).
CT evidence of a diverticular abscess has a prognostic impact as it correlates with a high risk of failure from nonoperative management. After treatment of diverticulitis with CT evidence of an abscess, physicians should strongly consider elective surgery in order to prevent recurrent diverticulitis.
Kaiser AM et al demonstrated in a retrospective study that conservative treatment fordiverticulitis failed in 6.8% in patients without abscess or perforation whereas 22.2% ofpatients with an abscess required an urgent resection (68.2%, one-stage, 31.8%, two-stage).
Recurrence rates were 13% for mild cases, as compared to 41.2% in patients with a pelvic abscess (stage II) treated conservatively with/without CT-guided drainage.Further study is needed to determine the best treatment for various stages of diverticulitis.

Reference
Kaiser AM, Jiang JK, Lake JP, Ault G, Artinyan A, Gonzalez-Ruiz C, Essani R, Beart RW Jr. The management of complicated diverticulitis and the role of computed tomography. Am J Gastroenterol. 2005 Apr;100(4):910-7.

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Investigation of Biomarkers as a Measure of Exposure to Air Pollutants

Particulate Matter (PM) is a form of air pollution consisting of solid and liquid particles suspended in the air. PM has been linked to a range of adverse health effects including asthma. A causal link has yet to be established, but chemicals called quinones that are present within PM are suspected of being involved in initiating inflammation that may lead to an asthma attack. Levels of quinones are high in Fresno, and it is possible that these air pollutants may be responsible for the high incidences of asthma experienced by residents within the region.

To investigate this possible relationship, it is important to know how much of a particular pollutant an individual has been exposed to. One approach to obtain this information is to monitor the levels of the pollutants or their metabolites in the urine or blood of the subject.
However, the use of these so-called biomarkers will only work if the levels of these compounds in the body are correlated with levels in the air. In this work, the urinary concentrations of ten quinones are being measured from sixteen human subjects (eight asthmatics and eight non-asthmatics). PM mass loadings and atmospheric quinone levels are simultaneously measured at two sites in Fresno. Quinones are extracted from the samples into an organic solvent, and are analyzed using gas chromatography/mass spectrometry.

Preliminary results indicate that urinary quinone levels are positively correlated with the organic components of PM, but not the total PM mass. These data suggest that the analytical method used is a promising approach to determine the exposure of individuals to these air pollutants.

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Perceptual Similarity, Difference, and Identity

The capacity for judging similarity is central to theories of cognition. Similarity is highly involved in a vast array of cognitive abilities, including categorization and concepts, language, memory, reasoning, and perception. Similarity is often used in many aspects of everyday life, such as unifying various clothing items to form an outfit, to deciding whether "a needle in a haystack" is an appropriate metaphor for the difficulty in locating your car in a city after forgetting where you parked. Despite its heavy use in both scientific and mundane descriptions and actions, similarity is little understood. It is virtually limitless in its flexibility, as it is so unconstrained that nearly any two objects or any two concepts can become more or less similar based on the context (e.g., your outfit and your car are very different when considering their physical materials, but very similar when considering both are often required for attending a conference). In a series of cognitive science experiments, the processing of perceptual similarity was investigated for both separable and integral features.

Separable features are those than can easily be made distinct from the other features of an object, such as separating an object's color from its shape. Integral features are those than cannot easily be made distinct from each other, such as a color's hue, brightness, and saturation. The findings demonstrate significant differences in how people process perceptual similarity, difference, and identity for objects with integral or separable features.

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Examining Pre-exposure as a Teaching Variable for Children with Autism

Intensive behavior therapy has been described as the treatment of choice for young children with autism (US Surgeon General, 2003). The purpose of this study is to determine whether pre-exposure to an item prior to formal teaching will increase the rate of acquisition during formal behavioral lessons. Three children were recruited from the Central California Autism Center. Behavior therapists currently working on the child's case received training on a protocol used to pre-expose selected target items during free-play. A single-subject, multi-element design which involves alternating the traditional teaching method of trail and error, with our pre-exposure teaching method was used. Results are expected to indicate that participants will obtain a higher percentage of correct answers in less time when using the pre-exposure method prior to engaging in formal teaching. The study discusses implications for formulating appropriate treatments for individual children with autism, with faster skill acquisition as one goal.

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A Comparative Study of the Nematocidal Activity of Phenyl and Ferrocenyl Chalcones

Chalcones are natural or synthetic compounds that have a broad range of biological activities. In a previous study, ferrocenyl chalcones were found to show nematicidal activity (O'Brien, 2006). The objectives of this study were to (1) synthesize phenyl chalcone analogs of ferrocenyl chalcones, (2) test the nematicidal activity of the synthesized phenyl chalcones, (3) and compare the nematicidal activity of the phenyl chalcones to that of the ferrocenyl chalcones. The chalcones were synthesized via the aldol condensation reaction, and were analyzed by 1H NMR and IR spectroscopy. The compounds were administrated to Caenorhabditis elegans nematodes in a solution of 1% DMSO and 99% liquid medium (100 μM concentration). Each nematode was incubated in 50 μl of the test solution and (3x96) duplicates were run for each compound. The (4'- fluorophenyl)- and (2'-thiophenyl) derivatives of phenyl chalcones caused 100% mortality for all duplicates on the first day of treatment and the furanylchalcone caused over 50% mortality in the same interval.
In comparison, the ferrocenyl chalcones with the same derivatives caused less than 10% mortality on the first day of treatment. Nematodes incubated in media containing ferrocenyl chalcones were able to reproduce in higher numbers when compared to those incubated in media containing the phenyl chalcone analogs. The results clearly suggested that the ferrocenyl chalcones are biologically less active than phenyl chalcones. More specifically, it seems that the ferrocene moiety in the ferrocenyl chalcones interferes with the biological function of the chalcone as a unit.

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Assessment of Freeze Damage in California and Possible Remedial Solution

Freeze damage to crops occur when water within the crop freezes and ruptures the cell membranes, which is not limited to only the fruit but also the leaves, twigs and wood. Citrus and some vegetable crops unlike deciduous trees cannot protect it self by shedding their leaves in the fall, but continue to grow year around.

This year's sudden drop in temperature has affected citrus, avocado, strawberry, winter vegetables, spring vegetables, artichokes, olives and flowers. Damage has been reported from as far as Imperial Valley and San Diego among others and has turned this into a Federal disaster. Currently, large wind machines are being used to keep off the cold air from settling over the crop canopy, unfortunately this method was not found to be very effective.
Research was initiated on the use of a harmless bacterium that contained an "ice nucleation" protein, but due to gene manipulation regulation and EPA disapproval the research did not see the light of the day (EPA 2005). In the wake of the recent crop damage all over California and other parts of the United States, unless drastic remedial measures are researched and implemented this might turn in to an epidemic in the years to come. This will not only affect the local economy but also the constant supply of fruits and vegetables for the masses.

This research proposes to use a Supervisory Control And Data Acquisition (SCADA) system to prevent freeze damage using a combination of irrigation techniques and computer modeling. The proposed computer model will be capable of making intelligent decisions and use the most effective solution according to the changing weather and demand conditions. Additionally this system will be used to manage the irrigation round the year using the SMART sensors as a feedback loop and provide water to the plants on DEMAND.