



ABSTRACTS

Tuesday, **April 12, 2011**

**UNDERGRADUATE
RESEARCH
SYMPOSIUM**



CONTENTS

Welcome from the Vice Chancellor for Academic Affairs and Provost . . . 5
Oral Presentation Session Abstracts 6
 A Sessions (11:00 a.m.–Noon)
 Session A.1, Proteins, Nutritional Variation, and Bioenergy (Illini Room A)
 Session A.2, Political Science Forum (Illini Room B)
 Session A.3, Advances in the Computing and Physical Sciences (Illini Room C)
 Session A.4, Race, Ethnicity, and Cross-Cultural Communication in Local and Global Perspectives (General Lounge, Room 210)
 Session A.5, Politics, Power, and Finance (Room 314B)
 Session A.6, American Art: At Home, In the World (Room 405)

 Featured Session (12:30–1:15 p.m.)
 “CampusCrime.net” (Illini Room B)

 B Sessions (1:30–2:30 p.m.)
 Session B.1, Realizing the Power of Natural Resources (Illini Room A)
 Session B.2, Cellular and Genomic Science (Illini Room B)
 Session B.3, New Research on Diabetes, Ovarian Cancer, Ecological Stressors, and Genotoxicity (Illini Room C)
 Session B.4, Language and Writing (General Lounge, Room 210)
 Session B.5, Educational Systems: Local and Global Voices (Room 314B)

 C Sessions (3:00–4:15 p.m.)
 Session C.1, Researching and Engaging Community Health (Illini Room A)
 Session C.2, Advances in the Engineering Sciences (Illini Room B)
 Session C.3, Understanding U.S. Literature and Culture (Illini Room C)
 Session C.4, Women and Children Matter (General Lounge, Room 210)

Poster Presentation Session Abstracts 37
 PA Session (9–10:15 a.m., Pine Lounge)
 PB Session (10:45 a.m.–Noon, Pine Lounge)
 PC Session (1:30–2:45 p.m., Pine Lounge)
 PD Session (3:15–4:30 p.m., Pine Lounge)

Participant Index 120
Mentor Index 123

Abbreviations

ACES	College of Agricultural, Consumer, and Environmental Sciences	FAA	College of Fine and Applied Arts
AHS	College of Applied Health Sciences	LAS	College of Liberal Arts and Sciences
BUS	College of Business	MDIA	College of Media
DGS	Division of General Studies	NURS	University of Illinois at Chicago College of Nursing, Central Illinois Regional Program
EDU	College of Education	SOCW	School of Social Work
ENG	College of Engineering	VMED	College of Veterinary Medicine

Welcome

Welcome to the fourth annual campus-wide Undergraduate Research Symposium. Showcased today are oral and poster presentations that remind us of just how deeply Illinois students are involved in the university's mission to discover and create—and to do so on behalf of the publics our institution serves. Deep, too, is the engagement of faculty and other instructional staff: nearly all symposium participants report that work on their projects was mentored by a professor, postdoctoral fellow, or doctoral student.

This year's symposium follows plans established by working groups that were convened by the Office of the Provost during the 2007–08 and 2008–09 academic years. Thanks once more to the faculty who led these groups: Professor Wojtek Chodzko-Zajko (Kinesiology and Community Health, AHS), Professor Jennifer Bernhard (Electrical and Computer Engineering, ENG), and Professor Wayne Pitard (Religion, LAS; and Spurlock Museum). This year, as in past years, interns provided invaluable support as plans for the symposium matured. Cristina Stanciu (Ph.D., English, LAS) and Emily Pinheiro (B.A. student, Spanish, LAS; Chancellor's Scholar) deserve our heartfelt thanks.

Even as we face unprecedented challenges across campus, we will continue to recognize the value of inviting students to play significant roles in research, scholarly, and creative endeavors at Illinois. The extraordinarily high quality of these endeavors distinguishes Illinois as a world-class university, one where undergraduates are partners in receiving the education they will need to become leaders in the twenty-first century.

Richard Wheeler

Vice Chancellor for Academic Affairs and Provost (Interim)

ORAL PRESENTATIONS

A SESSIONS, 11 a.m.-Noon

A.1, Proteins, Nutritional Variation, and Bioenergy (Illini Room A)

Which *Populus* clone genotype produces the most biomass?

Tahir Asmah Ibrahim, Senior, Horticulture, ACES

Mentor: Gary Kling, Crop Sciences, ACES

ABSTRACT

The purpose of this research is to determine which *Populus* (poplar) genotype is the most energy efficient for bio-energy production. The physiological measurements will allow the tracking of their individual growth rates and mass accumulation which will assist in calculating the tree coppice ratio. From these calculations, it will be determined which of these genotypes would be the best specimen as a feedstock. Based on current literature, it is anticipated that (*Populus trichocarpa* x *Populus deltoides*) x *Populus deltoides* will perform the best based on three factors: (1) its culture and ability to withstand extreme conditions, (2) its ability to take advantage of the available nutrients in a permissible environment, and (3) its ability to produce more mass depending on exposure to light.

Computational modeling of the Min protein system in *Escherichia coli*

Corey R. Fry, Junior, Chemistry, LAS

Mentor: Zan Luthey-Schulten, Chemistry, LAS

ABSTRACT

The Min protein system is known to regulate cell division in *Escherichia coli*. The MinD and MinE proteins oscillate from pole to pole, and it is proposed that these oscillations prevent unwanted cell division events at the poles and allow selection of the division site at the midcell for the formation of the FtsZ ring. We have examined the behavior of the Min system using stochastic computational methods and the chemical master equation in order to determine how the system is affected by various cell parameters, such as cell length, copy number of Min proteins, and degree of molecular crowding. This modeling may give insight into an explicit, molecular-based model for cell division.

The effects of nutrition on adult worker size of the fire ant *Solenopsis invicta*

Amanda Lynn Robinson, Senior, Integrative Biology, LAS

Mentor: Andrew V. Suarez, Entomology and Animal Behavior, LAS

ABSTRACT

Many ant species have the capacity to respond to nutritional variation in the environment by adjusting adult worker size. In this study, we examined the effects of plant-based food components on the adult worker size of *Solenopsis invicta*. If a component of plant-based food is the limiting growth factor for *S. invicta*, then colonies provided with a diet rich in this component will have larger adult worker size than colonies with diets that lack the component. Measurements of head length and head width of adult worker *S. invicta* were compared between colonies given one of four nutritional supplements: water (control), amino acids, carbohydrates, or carbohydrate/amino acid mixture. We expect carbohydrates to be the limiting nutritional factor in *S. invicta* with amino acids playing a less significant positive role. Based on previous lab work, I predict that the carbohydrate/amino acid treatment will result in the colonies with the largest workers, followed by carbohydrates only, amino acids only, and finally, water.

Characterization of PAR-enhanced 2-finger transcription factors via fluorescent anisotropy

Peiyi Wang, Senior, Chemical Engineering, LAS

Nathan Yee, Senior, Chemical Engineering, LAS

Mentor: Charles Schroeder, Chemical Engineering, LAS

ABSTRACT

Zinc finger proteins (ZFPs) are the most common eukaryotic transcription factors, sequence-specific binding factors, which play a key role in controlling the flow of genetic information from DNA to mRNA. Three finger ZFPs have been studied for many functions, such as gene repression and recombination, however two finger ZFPs have been largely ignored due to their inability to bind strongly enough for many applications. Two finger ZFPs are advantageous over three fingers because they bind to six rather than nine DNA bases. In this project, modified two finger proteins were produced, purified, and characterized via fluorescent anisotropy for their binding affinity and specificity. Several engineered two-finger ZFPs were combined with a transcription activator found in *Saccharomyces cerevisiae* called PAR. ADR1 is the only known wild-type two-finger transcription factor, which is believed to function only with enhanced binding from the PAR motif. The addition of the PAR motif similarly increased the binding coefficients in the engineered two fingers, making the binding comparable to three-finger ZFPs. This study has increased the variety of available engineered proteins and demonstrated that modified two finger ZFPs

can act as viable transcription factors. The ability to create customizable ZFPs with different numbers of binding domains opens the door for many studies of the activity and role of transcription factors.

A.2, Political Science Forum (Illini Room B)

Democracy, the rule of law, and political conflict: A global analysis in the post-World War II era

Jennifer Nestor, Senior, Political Science, LAS

Brittany Eslary, Junior, Political Science, LAS

Philip Santoso, Senior, Political Science, LAS

Mentor: Peter Nardulli, Political Science, LAS

ABSTRACT

The recent events unfolding in the Middle East have highlighted the impact that civil unrest can have on developing societies. Our research focuses on the role that the rule of law and democracy have on the structure of civil unrest (i.e., the level of violence, the role of state repression, etc.). In order to gain a better understanding of civil unrest, this project systematically analyzes news reports to construct a systematic view of unrest over time. Our method is based on the compilation of qualitative analysis of news sources to generate quantitative information concerning civil unrest and rule of law and democracy, resulting in data that is then further analyzed. Data is extracted by humans, unlike other research that relies heavily on computer generated coding. By relying on human coders, we are able to capture more specific information on initiators, targets, context, and reactions to destabilizing acts. Despite efforts to address the source of unrest, conflicts rooted in anti-government sentiment, class conflict, and socio-cultural conflict continue to emerge in different societies around the world, as recent events in North Africa and the Middle East demonstrate. Our findings, which cover the post-WWII era for the entire world, will provide a unique perspective on these contemporary developments.

A.3, Advances in the Computing and Physical Sciences (Illini Room C)

PyMercury: Interactive python for the mercury Monte Carlo particle transport code

Forrest Iandola, Junior, Computer Science, ENG

Mentor: Matthew O'Brien, Lawrence Livermore National Laboratory

ABSTRACT

Monte Carlo particle transport applications are often written in low-level languages (C/C) for optimal performance on clusters and supercomputers. However, this development approach often sacrifices straightforward usability and testing in the interest of fast application performance. To improve usability, some high-performance computing applications employ mixed-language programming with high-level and low-level languages. In this study, we consider the benefits of incorporating an interactive Python interface into a Monte Carlo application. With PyMercury, a new Python extension to the Mercury general-purpose Monte Carlo particle transport code, we improve application usability without diminishing performance. In two case studies, we illustrate how PyMercury improves usability and simplifies testing and validation in a Monte Carlo application. In short, PyMercury demonstrates the value of interactive Python for Monte Carlo particle transport applications. In the future, we expect interactive Python to play an increasingly significant role in Monte Carlo usage and testing.

Short-term spectroscopic variability of quasars in the Sloan Digital Sky Survey

Benjamin Tyler Montet, Senior, Physics and Astronomy, LAS

Mentor: Robert Brunner, Astronomy, LAS

ABSTRACT

Since 2000, the Sloan Digital Sky Survey (SDSS) has collected spectral information on more than 100,000 quasars by combining data from three consecutive 15-minute observations. By analyzing differences between these measurements, an attempt can be made to observe and quantify quasar variability on intra-hour timescales, a feat which has previously only been attempted photometrically and with small data sets. By calibrating against stars observed concurrently, we estimate the average variability in all observed quasars in the ultraviolet and visible spectrum. With precise SDSS spectroscopy, the differences in variability between the continuum and emission lines can be compared. We then analyze the detected fluctuation as a function of quasar properties such as redshift, luminosity, and host black hole mass in an attempt to determine the mechanisms that drive quasar variability and the extent of their relative importance.

Dissipation of graphene within a high-Q superconducting CPW resonator

Emily Sprague, Senior, Engineering Physics, ENG

Mentor: Alexey Bezryadin, Physics, ENG

ABSTRACT

This study aims to study the dissipation of graphene when it is placed within a high-Q superconducting coplanar waveguide (CPW) resonator. By transferring a

single layer of graphene over the resonator, we are able to study the interaction between the graphene and resonator in GHz frequency range. The sample was cooled down to about 1.4 K in He4 cryostat where the resonator is in superconducting state giving a large quality factor(Q~100K) of the resonator , and a series of resonance peak were measured at microwave frequency range(1-10GHz) using a vector network analyzer. Resonance peaks were measured and compared across three separate configurations: first for the resonator by itself, second for the resonator with graphite, and third for the resonator with a monolayer of graphene. The quality factors and total energy dissipated were calculated for each case. We expect to see a broad resonance peak for the case with graphite or graphene, and a sharper peak for just the resonator. We hope to better understand the electrical properties of graphene and to study the effects of graphene inside a resonant cavity, which to date has not been documented.

A.4, Race, Ethnicity, and Cross-Cultural Communication in Local and Global Perspectives (General Lounge, Room 210)

The efficacy of cross-cultural training approaches

Ishva Minefee, Jr., Senior, Global Studies, LAS

Mentors: Brian Dill, Sociology, LAS; Maria Alexandre, Business Administration, BUS

ABSTRACT

This study analyzes the efficacy of the didactic and experiential approaches utilized in cross-cultural training programs. As multinationals continue to expand abroad, it has become ever-increasingly necessary for expatriates to understand how to work effectively in overseas assignments. Prior research estimates that 10-40% of U.S. expatriates return home prematurely due to a failure of adjustment in their host country. To combat these negative trends, multinationals hire the services of consulting firms to train expatriates. Through a series of phone interviews and questionnaires, I analyze how the aforementioned approaches can be improved upon and how consultants and trainers alike can better serve the needs of expatriates. There are relatively few studies in the literature that address the efficacy of these two approaches and this research will contribute to the theoretical understanding of this subject. Ultimately, this research can contribute to creating more successful expatriate experiences in foreign assignments.

A tale of two integrations: Minnie Miñoso, Ernie Banks, and Chicago baseball

Ryan A. Schmidt, Junior, History, LAS

Mentor: Adrian Burgos, Jr., History, LAS

ABSTRACT

Considered among America's greatest cities, Chicago's infamous racial history makes it a unique city in which to view American race relations. While there have been a countless number of pages written about Chicago's notorious past in terms of racial violence and resistance to residential integration, few have collectively examined the role that the integration of the city's two professional baseball teams, the White Sox and the Cubs, played in this chapter of Chicago's history. This paper examines the integration of these two teams by juxtaposing the experiences of their first black players: Minnie Miñoso (White Sox) and Ernie Banks (Chicago Cubs). By examining each team's geographical and imagined location within the city's racial landscape, one can begin to uncover some of the reasons why an almost three season gap existed between their respective integrations. The tumultuous issue of race and space within the Chicagoland area will help provide a backdrop to the intense racial environment that existed when both men integrated. By taking this new approach to studying integration and race relations, the multiple strategies that were taken in the process of integration will be analyzed. Indeed, while a powder keg of racial tension was brewing in 1950s Chicago, Miñoso and Banks emerged out of this hostile situation as baseball heroes. However, the positive reaction that most fans had toward these black players when they were on the field did not necessarily go beyond the ballparks' gates. Chicago and baseball thus stand as an imperfect mirror of the social changes taking place during this time—a time when Chicagoans would embrace their city's first black players. Yet, at the same time, these fans unveiled a different attitude when their homogeneous neighborhoods were being threatened by the prospect of racial integration.

Ethnocentrism and individualism: Aspects to discuss when considering the decline of the United States' international status

Marissa Ann Mayes, Junior, Political Science, LAS

Kuok Pui San, Visiting Student

Mentor: Maria Cynthia Anderson, Education Policy, Organization, and Leadership, EDU

ABSTRACT

Understanding various cultures is an important concept to grasp in order to understand International and domestic policies. Often the west has an ethnocentric way of thinking. Ethnocentrism is the idea that one's ethnic and or cultural group is centrally important, and that other groups are measured in

relation to one's own. Focusing on the United States of America, ethnocentric ideas are prevalent in international and domestic policies. When looking at past disputes between the United States and other international actors, often times the United States has attempted to push democratic ideal upon other states. A central question this research explores is whether ethnocentric behavior is hindering the United States in international growth. Since the Second World War, the United States has been deemed as the sole superpower state. A superpower state is one with a dominant position in the international system, with the ability to influence events and its own interests while projecting power on a worldwide scale to protect those interests. However, recent statistics have shown that the United States has fallen behind countries such as the Federative Republic of Brazil, People's Republic of China, European Union, Republic of India, and the Russian Federation. These countries have all grown to become competing superpowers. In part, this emergence is due to their large markets, growing military strength, and economic potential and influence over international affairs. Furthermore, the research looks into the claim that the rise in power of countries other than the United States is due in part to an emphasis on collectivity which values group cooperation over individualism.

Many paths to "Desi": Indian-American undergraduates and the consumption and performance of culture at the University of Illinois

Rachel Ann Zibrat, Senior, Anthropology and Linguistics, LAS

Mentor: Alma Gottlieb, Anthropology, LAS

ABSTRACT

As a highly visible and active campus minority community, Indian-American students are proud of their heritage and are sometimes (but not always) eager to apply it to the campus community as a whole. How do Indian-American undergraduates negotiate their identities by both performing and consuming ethnic cultural practices in a U.S. setting? Students perform their culture by participating in dance groups, musical groups, and cultural organizations that are active in the Champaign-Urbana community. Students also consume their culture, especially through watching Indian films (both Hindi and regional), and through transnational cinema and television, such as *Slumdog Millionaire*, *Outsourced*, *The Namesake*, and other films and shows produced in the West about India, or vice versa. Additionally, I pursue the larger question of group inclusivity and exclusivity within the Indian-American student community, and what it means to perform and consume Indian culture as an Indian-American student. Cultural groups are extremely important to the perpetuation of a unified Indian-American identity at the University of Illinois. I am particularly interested in the Indian-American students who are not part of these mainstream cultural organizations, and how they find their place on campus and mitigate their relationships with their heritage without the aid of these large organizations. Although the scope of this thesis only encompasses Indian-American students,

the larger issues this community faces of belonging, legitimacy, and inclusivity are concerns that many campus communities and organizations encounter, whether those groups are centered around ethnicity, religion, ideology, or occupation. While this particular form of identity negotiation may be unique to Indian-American students, certainly all college students share in the struggle of finding a place on campus to thrive and grow.

A.5, Politics, Power, and Finance (Room 314B)

Determinants of cross-border mergers and acquisitions and private equity transactions

Richard M. Crowley, Junior, Finance and Accountancy, BUS, and Mathematics, LAS

Mentor: L. Ola Bengtsson, Finance, BUS

ABSTRACT

The frequencies of mergers and acquisitions (M&A) and private equity transactions (PE) are highly correlated within the United States. However, it is largely unknown if this relationship holds true for cross border M&A and PE transactions. This research analyzes the correlation between M&A and PE transactions, both cross-border and domestic. Furthermore, we show what factors have the greatest effect on the correlation of the frequencies of M&A and PE transactions between countries, taking into account legal, economic, and social factors.

Analyzing deterrence: Defensive alliance formation and militarized dispute onset

Michael R. Kenwick, Senior, Political Science and History, LAS

Mentor: John Vasquez, Political Science, LAS

ABSTRACT

The scholarly literature is currently divided on the relationship between defensive alliance formation and the onset of militarized interstate disputes. While some scholars suggest defensive alliances will speed the approach to military conflict, others posit that defensive alliances effectively dampen the likelihood of dispute onset. This study seeks to make headway in this debate through the construction of two novel tests on this relationship, each using data encompassing all politically relevant dyads in the international system from 1816 to 1944. The first test utilizes a regression model to determine whether and how defensive alliances interact with offensive alliances and neutrality pacts to impact dispute likelihood. The second employs an experimental research design to determine whether states typically experience more militarized disputes

before or after defensive alliance formation. Initial results suggest that defensive alliances do interact significantly with other alliance types, but do not seem to diminish the likelihood of conflict within the same dyad over time.

Taming the bear: Does regime type matter for economic recovery?

Jacob Foster Hollars, Senior, Political Science, LAS

Mentor: Jose Antonio Cheibub, Political Science, LAS

ABSTRACT

Over 300 banks in America alone have failed over the past two and a half years. Furthermore, much of the industrialized West is experiencing difficulty in spurring robust recovery from the financial crisis that precipitated a sudden, deep recession. China and other East Asian countries, most notably more autocratic ones, on the other hand, did not experience quite the same shock as the West and they are already beginning to experience fairly robust recovery. This situation presents an interesting question and possible challenge to the spread of democracy and freedom in the world. Does regime type play a large, or any effect on economic recovery from recessions? Put more concisely, what effect does regime type have on economic recovery from recessions? In this study I study all recessions in all countries from 1950 until the present. As there is little empirical research on the direct effect of regime type on economic recovery, much of my research is original, but draws somewhat from the extant literature on regime and economic growth. Maybe most importantly, my findings may have very large implications for democracy promotion and the promotion of market liberalization and other Washington Consensus policies.

Beyond borders: How territorial norms affect postcolonial states

Benjamin Ostick, Senior, Political Science, LAS

Mentor: John A. Vasquez, Science, LAS

ABSTRACT

Comprising the results of a senior thesis in Political Science, this presentation will address the effects of territorial norms on postcolonial states. The primary theoretical logic under evaluation is that such norms, by constraining elite behavior in heterogeneous societies, create weak conflict-prone states. In focusing on postcolonial states especially, these norms, which influence behavior toward border change and territorial aggrandizement, are thought to have the greatest effect. The reason for this is due to many postcolonial states having inherited colonial boundaries that often disregard ethnic differences, thereby creating volatile cleavages by which a population may easily divide. By then proceeding through each step of this potential process, this presentation will highlight the complexities inherent in the relationships between norm strength, external threat, state capacity, and both interstate and substate conflict. In

addition to this argument, an overview of the existing literature as well as the results of the presenter's statistical analysis will be exhibited. Emphasis will be placed upon the theoretical construction, its operationalization, and finally the testing and evaluation stage. While bringing to light some of this study's significant findings, the presentation will also showcase the development of a multi-stage research project. All in all, my senior thesis incorporates original theorizing, an experimental design, and statistical analyses.

A.6, American Art: At Home, In the World (Room 405)

In All My Years: Exploring the social and artistic elements of African American photography

Sydney Stoudmire, Senior, Art History, LAS

Mentor: Dana Rush, Art History, FAA

ABSTRACT

In October 1983, artist photographer Raymond Bill of Urbana, Illinois began working on a photograph exhibition to celebrate the accomplishments and contributions of African Americans in the Champaign-Urbana community. The exhibition, titled *In All My Years: Portraits of Older Blacks in Urbana-Champaign*, featured black and white portraits of fifty-five elderly African Americans, accompanied by vignettes that offered glimpses of the individuals portrayed. Although it was created to spur interest in documenting African American history, nearly thirty years later, it remains one of the few efforts made to examine black history in the two cities. This fact illustrates that there is need for research and publishing on black history in academia. In contribution to increasing critical discussions about African American history, this study examines *In All My Years* from two perspectives. It is first analyzed for its aesthetic and visual elements, and then socio-cultural function of the photographs is explored. The conventions of fine art photography are then discussed and challenged in relation to Raymond Bill's photographs, along with the works of well-known African American artist photographers. Published research on African American photography from an art historical and social perspective is very rare, and the goal of this study is to encourage further research on African American contributions to art and history. More broadly, the objective of this examination is to continue increasing interest in the research, critical discussion, and documentation of black history, not only in Champaign-Urbana but also throughout the country.

American art in the Venice Biennale

Christina Michelin, Senior, Art History, FAA

Mentor: David O'Brien, Art History, FAA

ABSTRACT

For the past eight months, I have dedicated an immeasurable amount of time researching the Venice Biennale, arguably the world's largest biennial art exhibition. The exhibitions began at the end of the nineteenth century in 1895, and continue today, though they were briefly put on hold during the world wars. Broadly, my interests in the history of art fall into the realm of nineteenth-and early twentieth-century American and European art, focusing on transatlantic influence and exchange. As such, my honors senior thesis revolves around the idea of American art in these early Venice exhibitions, beginning with 1895 but concentrating on 1909, a show that included over sixty notable American artists. For the purposes of the research symposium, I hope to introduce a brief history of the Venice Biennale. I was fortunate enough to attend the Biennale in 2009, and plan to give a brief overview of the exhibition today and then explain its beginnings and evolution. I will include information regarding post-unification Italy, Venice's role in the newly unified nation, and the significance of the exhibition for Venice. I will also articulate the American view of Venice, and how the quest for a national art in America both influenced the Biennale and paralleled Venice's desire to be a stronger presence in its own country.

FEATURED SESSION (Illini Room B)

CampusCrime.net

Taylor Anne Lemick, Senior, Journalism, MDIA

Kate Szyszka, Senior, Journalism, MDIA

Emily Carlson, Journalism, MDIA

Mentor: Eric Meyer, Journalism, MDIA

ABSTRACT

In response to unprecedented concern about crime on campus, more than 40 journalism students created an interactive online resource so others could get past myth and rhetoric and examine campus crime in a uniquely interactive way. With more than a month's worth of research and analysis, CampusCrime.net uncovers the truth behind the rumors and misconceptions of campus crime. Rather than create text-based narratives that force readers to follow only one pathway through material, they presented, without comment, audio highlights of hundreds of interviews they conducted and created interactive features that allowed users to query the data their research uncovered in whatever manner the users desired. Students developed new skills in data analysis and visualization plus techniques of online coding and design in addition to practicing professional journalistic skills. Some of the findings are as follows: A significant but not highly unusual uptick in violent crime combined with an expansion of the university crime alerts (well in excess of what is required) created a climate of fear and concern among many parents and students. While parental concerns focus on sexual assault in the dorms, the rise in crime is off-

campus assault and battery. While UIPD has experienced criticism (resulting in increased resources), only a small portion of the crimes have occurred in their jurisdiction. Beyond traditional text stories, the website uses interactive, new media reporting techniques: Audio/video highlights of victims, parents, students, and authorities. Ten years of crime databases are analyzed with numerous interactive maps and graphics. Photos from the scene and original alert text for each of the 36 recent crime alerts are used to show what it looked like at the time of the crime. Unique insight into what spurs violence with an exclusive interview with a person convicted of being the assailant in a campus crime alert. The most dangerous spots on campus, as reported in a survey of more than 200 students, were contacted through social media.

B SESSIONS, 1:30-2:30 p.m.

B.1, Realizing the Power of Natural Resources (Illini Room A)

Prepartum supplementation of distillers grains to beef cows influences cow performance

Adam R. Schroeder, Senior, Animal Science, ACES

ABSTRACT

Prepartum supplementation of distillers grains to beef cows influences cow performance. A. R. Schroeder, D. W. Shike, D. B. Faulkner, T. B. Wilson, F. A. Ireland. Department of Animal Sciences, University of Illinois, Urbana 61801.

Angus cows (n = 128) and crossbred cows (n = 132) were utilized to evaluate the effects of prepartum supplementation of dried distillers grains plus solubles (DDGS). Cows were blocked by breed, and each breed was randomly allotted into 6 groups. Half the cows were supplemented with 2.1 kg DM/head/d DDGS while the remainder of the cows did not receive any supplementation. The supplementation period was 60 days prepartum until calving. Each pair of replicate groups was grazed on tall fescue and red clover mix pastures of similar size. To decrease variation between pastures, forage density and height samples were taken with a rising plate meter. Measurements were compared and only pastures of similar density and height were used. Initial cow body weights and BCS were recorded on all cows at initiation of supplementation period. No differences between initial body weight (P = 0.79) and initial BCS (P = 0.22) were found. Supplemented cows were fed daily until calving. Once weekly, cows that had calved were removed from test pastures, weighed, and assigned a BCS before being comingled in pastures without further supplementation. Calves were weighed at birth. No difference in calf birth weights (P = 0.37) was observed. Supplementation tended to increase cow body at calving (P = 0.08)

and BCS change ($P = 0.09$). Supplemented cows had greater ADG ($P = 0.04$) over the feeding period when compared to cows with no supplementation. In agreement, cows also had a more positive weight change ($P = 0.04$). In summary, prepartum supplementation of distillers grains to beef cows improved cow BW and ADG without causing a change in calf birth weights.

Keywords: Distillers grains, beef cows, cow supplementation.

Improving day-ahead wind forecasts using a Bayesian model averaging for better wind power grid integration

Maxwell Smith, Senior, Atmospheric Sciences, LAS

Mentor: Somnath Baidya Roy, Atmospheric Sciences, LAS

ABSTRACT

The U.S. Department of Energy (DOE) recently set its goal to achieve 20% wind energy penetration by the year 2030. In order to meet this goal, wind farms must be integrated into the existing power grid. Sufficient integration requires that operators guarantee a particular output 24 hours in advance or risk paying heavy fines. There is no way to guarantee power output without first forecasting the wind speed. Since power output is proportional to wind speed, accurate wind forecasts are essential for reliable power predictions. According to the National Renewable Energy Laboratory (NREL), a 10% error reduction in power forecasts at 24% penetration would lead to an annual \$500M savings in the U.S. Our study focuses on improving accuracy in 24-hour forecasts of wind speed and direction using the Weather Research and Forecasting (WRF) model over 16 stations in the Midwestern U.S. We have generated an ensemble of 19 model forecasts, each with separate configurations, between July and October 2010. Studies have shown that the ensemble forecasting technique reduces errors due to model imperfections and that the linear ensemble mean consistently outperforms the forecast of any individual model. We intend to show that calibrating the ensemble against observed data can improve the accuracy of the ensemble forecast compared to the linear mean. We will calibrate our ensemble using the Bayesian Model Averaging (BMA) technique. We have implemented a BMA calibration tool that will train the ensemble over the period from July to September. Next, we will evaluate the performance of the calibrated ensemble against observations from September to October. We will show that the BMA calibrated ensemble significantly outperforms the uncalibrated ensemble mean, reducing error by the NREL benchmark 10%. This reduction would result in significant cost savings, suggesting benefits for both the power producers and consumers.

An evaluation of BAF prism size and tree measurement techniques in the central hardwood region of southern Illinois

Timothy Michael Ward, Senior, Natural Resources and Environmental Sciences, ACES

Mentor: Jay Hayek, Natural Resources and Environmental Sciences, ACES

ABSTRACT

The careful inventory and analysis of forest land is essential in numerous ways: forest management, long- and short-term forest planning, forest biomass and carbon sequestration, forest landowner assistance and outreach, state reporting and funding, and research. This study aims to determine the most accurate, efficient, and cost-sensitive approach to sampling forest land and creating sound experimental design. Professional foresters have historically used variable radius plot sampling with 10BAF (Basal area factor) prisms, Biltmore sticks, and Merritt hypsometers to measure DBH (Diameter at breast height), and merchantable log length and volume. Based on peer-reviewed literature and the availability and affordability of newer forest inventory equipment, the investigators contend that the majority of foresters are using inappropriate and antiquated techniques and equipment, which ultimately results in biased and underestimated stand- and forest-level data. During the summer of 2010, seven data sets were collected from 30 systematically placed plots in Pope County, Illinois, on a 26.2-acre forest at the University of Illinois Dixon Springs Agricultural Center. A DBH tape and an electronic clinometer were used to gather data from fixed 1/10-acre plots, and one data set from the 10, 15 and 20BAF prisms. A Biltmore stick and a Merritt hypsometer were used to obtain DBH and merchantable height measurements for the other 10, 15 and 20BAF prism data sets. Merchantable height was collected for all in trees of sawtimber size (12in. DBH or larger). Limiting distance was measured to ensure borderline trees were appropriately sampled. From these data sets mean population parameters (trees/acre, basal area/acre, and volume/acre) were calculated and correlated with recorded time data to obtain a measure of efficiency and accuracy for each sampling method. The results of this research will help Illinois foresters more effectively manage and protect our 4.3 million acres of wonderful forest land.

B.2, Cellular and Genomic Science (Illini Room B)

Functional significance of adult hippocampal neurogenesis in pro-cognitive effects of exercise

Daniel Scott Miller, Senior, Molecular and Cellular Biology and Psychology, LAS

Mentor: Justin Rhodes, Beckman Institute

ABSTRACT

Neurogenesis, the production of new neurons, continues throughout adulthood in the brain of many mammals. Rates of neurogenesis are strongly correlated with levels of physical activity in rodents, but the functional significance remains a mystery. We used a transgenic mouse model to reduce adult hippocampal

neurogenesis to test directly whether new neurons from wheel running were required for mice to display enhanced performance on the water maze, rotarod, and contextual fear conditioning from exercise. The transgenic mice carry a herpes simplex virus thymidine kinase (HSV-TK) gene under the control of the glial fibrillary acidic protein (GFAP) promoter. HSV-TK modifies the drug ganciclovir into a toxic nucleotide analog causing death of only dividing cells. Administration of ganciclovir therefore specifically prevents proliferation of cells expressing GFAP, which include astrocytes and adult neural stem cells in the brain. A total of 96 mice were used in the study, divided equally by sex and treatment. Animals were surgically implanted with minipumps containing saline or the drug ganciclovir, administered over a period of 28 days during the period when mice were either housed in standard laboratory cages or with running wheels. The first 10 days, animals received daily injections of bromodeoxyuridine (BrdU) to label dividing cells. The last 10 days mice were tested on water maze, rotarod, and fear conditioning, and then euthanized to measure number of immunopositive BrdU cells. Exercise induced a doubling of neurogenesis in control animals, and administration of ganciclovir to transgenic animals successfully prevented the exercise-induced increase. Surprisingly, half of the transgenic mice given ganciclovir (about 50% of the animals in this group) developed self-inflicted skin wounds discovered during behavioral testing and had to be removed from the study. Observed and unknown side effects of this transgenic method are a major confound of the study and prevent conclusions about the role new neurons may be playing cognitive performance. A future experiment will repeat this study using a herpes simplex thymidine kinase nestin transgenic mouse, as nestin is thought to be more restricted to neural progenitor cells than GFAP.

Successful gene delivery with receptor-targeted PAMAM dendrimers occurs via caveolae-mediated pathways

Jacob R. Becraft, Chemical and Biomolecular Engineering, LAS

Mentor: Daniel W. Pack, Chemical and Biomolecular Engineering, LAS

ABSTRACT

Successful gene therapy requires the delivery of a therapeutic gene from the exterior of a cell to its nucleus via a delivery vehicle. We have developed a synthetic vehicle based on the polyamidoamine (PAMAM) dendrimer that successfully delivers its genetic cargo to target cells expressing the folic acid or transferrin receptors. This project seeks to elucidate the role of cell-surface receptor mediated endocytosis of synthetic gene delivery vehicles in efficient gene delivery. The folic acid (folR) and transferrin receptors (TfR) are over-expressed in many types of cancerous tumors and have been investigated for receptor-specific targeting of gene delivery vehicles. These ligands, along with their receptors, are endocytosed and trafficked through HeLa cells via two different pathways: caveolae (folR) and clathrin coated pits (TfR). Endocytic

vesicles trafficked through these two pathways differ in their degree of vesicle acidification and final intracellular destination. This study investigated the effect of receptor specific targeting on PAMAM-mediated gene delivery in the HeLa cell line. Briefly, PAMAM was conjugated to folic acid or transferrin ligands, and subsequently mixed with DNA to form gene delivery polyplexes for cellular delivery. Vehicle gene delivery activity and uptake into cells were both investigated using a luciferase reporter gene system in the presence of drugs that inhibit caveolae and clathrin pathways. At the optimal ligand/PAMAM and DNA/PAMAM (N/P) ratios, delivery activity of PAMAM vehicles targeted to the folic acid receptor increased seven fold over unmodified PAMAM, while that of PAMAM targeted to the transferrin receptor increased over five fold. However, results indicate that polyplex uptake into the cell is minimally correlated with level of receptor targeting or gene delivery activity. Our results suggest that the improved gene delivery activity observed in receptor-targeted PAMAM is the result of improved intracellular trafficking of PAMAM polyplexes, and not from enhanced uptake at the cell surface.

The impact of genome rearrangement on the evolution of human gene regulatory elements

Peter J. Cote, Bioengineering, ENG

Mentor: Jian Ma, Bioengineering, ENG

ABSTRACT

Large-scale genome changes are highly relevant to the biomedical sciences, as many human diseases are associated with large-scale genomic aberrations. In addition to point mutations and small insertions and deletions (indels), large-scale genomic changes such as rearrangements, duplications, and large indels are also prevalent between different mammalian genomes. Identifying these large-scale changes and discovering their functional implications is critical to understanding the human genome. The purpose of this project is to assess the impact of genome rearrangements on the non-coding regions in the human genome, which is largely unknown. These non-coding regions contain a substantial number of regulatory elements and other functional elements in the human genome. We study the large-scale genomic changes that may result in the alteration of the structure of enhancers, silencers and other regulatory elements, which in turn can affect the expression of nearby genes. We employed novel computational methods to discover and analyze intergenic and gene-body regions in the human genome that have expanded or contracted as compared to their orthologous regions in the chimpanzee, the mouse, and the dog. We determined the cause of some of the expansions by looking for an increase in the density of transposable elements and segmental duplications and comparing it to that of random intervals in the study. Then, to assess the impact of these rearrangements on gene regulation, we looked for genes near these regions known to be differentially expressed in the human and the chimpanzee, and checked for any correlation between the expansions/contractions and the

expression of the nearby genes. As an ongoing effort, we are investigating if the changes of these regulatory elements caused by large-scale genomic operations may lead to altered gene expression in different species. So far, we observed that within contractions, there was positive selection for the different types of regulatory elements.

A parallel-plate flow chamber to screen for cadherin-mediated cell adhesion

Shyam M. Saladi, Freshman, Electrical Engineering, ENG
Mentors: Nitesh Shashikanth, Biochemistry, LAS; Deborah Leckband, Chemical and Biomolecular Engineering, ENG

ABSTRACT

Cadherins are a superfamily of proteins, which mediate cell-cell adhesion in all soft tissues. Proper cadherin function is essential for tissue development and the maintenance of epithelial barriers. Cadherin-mediated cell adhesion may act as a sensor of mechanical force on the cell, triggering junction reorganization. The force-dependent response of cadherins can be quantified through the use of a parallel-plate flow chamber. This technique allows for the placement of cells in a large, constant, and tunable flow field, with a known shear stress. Quantification of cadherin-mediated mechanosensing over a range of stresses will further elucidate the pathways for biologically relevant processes, such as lymphocyte migration in the inflammation response.

B.3, New Research on Diabetes, Ovarian Cancer, Ecological Stressors, and Genotoxicity (Illini Room C)

Blueberry varieties grown in Southern Illinois and their *in vitro* anti-diabetic potential

Anita Lucius, Senior, Food Science and Human Nutrition, ACES
Mentor: Elvira de Mejia, Food Science and Human Nutrition, ACES

ABSTRACT

Diabetes is the sixth leading cause of death in the U.S., affecting over 18 million people. Blueberries (*Vaccinium corymbosum*) were found to significantly improve total plasma antioxidant capacity and glucose metabolism in both healthy and metabolic risk factors subjects. The objective of this research is to study the antioxidant capacity and total polyphenol blueberry varieties and their *in vitro* amylase and glucosidase inhibition as biomarkers of anti-diabetic effects. Fifteen blueberry varieties grown in Southern Illinois (Berkley, Blue Chip, Blue Haven, Blue Jay, Bluecrop, Blueray, Bluetta, Collins, Coville, Darrow, Earliblue, North Country, Patriot, Spartan, and Stanley) and one commercial

blueberry grown in Georgia were studied. Blueberries were analyzed for their size, weight, pH, total sugar concentration, antioxidant capacity ($\mu\text{mol Trolox equivalent, TE / g blueberry}$), and total polyphenols ($\text{g gallic acid equivalents, GA eq. / g blueberry}$). The percent enzymatic inhibitions were compared to 1 mM acarbose, a known inhibitor of amylase and glucosidase. Results showed that blueberries have significant hypoglycemic effects (36.4-85.0% amylase inhibition and 65.3-154.5% glucosidase inhibition). In addition, high antioxidant capacity (5.9-11.0 $\mu\text{mol Trolox equivalent / g blueberries}$) and high total polyphenol concentration (0.39-1.00 g gallic acid equivalent / g blueberries) were observed. In general, glucosidase inhibition in blueberries was found to be more effective than amylase inhibition. These results suggest that high antioxidant capacity and high total polyphenols could contribute to the hypoglycemic effects in blueberries, making them a desired natural source for diabetes prevention. In conclusion, blueberries exhibit potential to inhibit amylase and glucosidase, which may suggest possible anti-diabetic effect.

Comparison between healthy and cancerous domestic hen (*Gallus domesticus*) ovary as a model for human ovarian cancer

Elsa C. Holden, Senior, Animal Sciences, ACES
Mentor: Janice Bahr, Animal Sciences, ACES

ABSTRACT

In this study, we will use samples collected from hens with normal ovarian morphology ($n=2$) and from hens with cancerous ovarian tissue ($n=5$) to compare between prevalence of estrogen receptor, progesterone receptor, metalloproteinase-9 (MMP-9), and basigin (EMMPRIN). Tissues were collected from 3 year old laying hens that were euthanized as a part of further study on ovarian cancer by Dr. Animesh Barua of Rush University Medical Center. Hens had not been receiving treatment for their condition and had been monitored for ascites and presence of follicles on the ovary. Tissues were then fixed in a 10% buffered formalin and embedded in paraffin. Using a microtome, tissues were sectioned to 4 μm and placed on microscope slides. Tissue treatment has yet to be completed, but antigens will be retrieved by incubation in a citric buffer and then rinsed in a phosphate buffered saline. Exogenous peroxidases will be inactivated and non-specific antibodies will be blocked before tissue is incubated with a primary antibody specific to the molecule being tested. The primary antibody-treated tissue will then be incubated in a biotinylated secondary antibody made against immunoglobulin of the animal species in which the primary antibody was made. The secondary antibody expression will then be amplified through the use of an ABC kit and a DAB reaction, which will result in an insoluble brown product that can be visualized under the microscope. Counterstaining with hematoxylin and eosin can also be done to compare where in the morphology the specific molecules are expressed. Expression of estrogen receptor, progesterone receptor, MMP-9, and basigin

will then be compared between the control (healthy) hens and the cancerous tissue. Quantification of data will be based on relative presence of the molecules being measured and not on numerical data.

Mammalian *in vitro* toxicity of disinfected water contaminated with an X-ray contrast agent drug

Kevin M. Homann, Junior, Chemical Engineering, LAS

Mentor: Michael J. Plewa, Crop Sciences, ACES

ABSTRACT

The purpose of this summer research project was to analyze the genotoxicity of chloraminated source water, which contained 10 M iopamidol, an X-ray imaging contrast pharmaceutical. This was done by treating Chinese hamster ovary (CHO) cells with various concentrations of the sample and measuring the DNA damage induced using single cell gel electrophoresis (SCGE). The entire study consisted of a wider variety of disinfection methods that were analyzed as well as analyzing the cytotoxicity of the samples. My subset of the study consisted of analyzing the samples treated by the method of chloramination and comparing them to the data collected from the chlorinated source water.

Urinary C-Reactive Protein as a measure of inflammatory response to ecological stressors in rural Poland

Laura Danielle Klein, Senior, Integrative Biology Honors, LAS

Mentor: Kathryn Clancy, Anthropology, LAS

ABSTRACT

In recent years, C-Reactive Protein (CRP) has been of great interest to both medical and anthropological studies as it is a biomarker commonly used to evaluate both acute and chronic inflammation due to disease and other ecological stressors. In this study, urinary CRP was measured from an archived data set collected from a population of traditional agriculturalist women in rural Poland in order to determine the relationships between chronic inflammation and ecological stressors such as dietary composition and energy expenditure. Inflammatory processes impact immune function and broader health outcomes, so the ability to determine relationships between markers of inflammation and ecological stressors will be crucial for understanding mechanisms that link environment and health. Though CRP levels have been extensively studied in blood samples, no previous literature has examined CRP in human urine. In 2010, I modified an existing protocol for isolating C-Reactive Protein from rat urine for use with human urine. This procedure results in a concentrate that, when utilized in a commercially available enzyme immunoassay, produces a range of CRP concentrations similar to that observed in human serum. Because urine collection is a noninvasive method, an average of six samples per individual is available over a one-month period of the harvest season. Studies using blood

are frequently unable to collect such large longitudinal samples and instead rely on cross-sectional samples, making this study unique in its ability to examine how C-Reactive Protein changes within individuals as a result of changes in ecological and energetic stressors. As this is the first study to use urinary CRP to examine relationships between inflammatory process and energetic stressors, this will open avenues for researchers to examine inflammatory processes in other, existing datasets and increase the amount of biomarker data available from a single urine sample in future studies.

B.4, Language and Writing (General Lounge, Room 210)

***Ich denke, ich sage, ich wei, daß:* The use of projection in second language writing**

Christine M. Evans, Senior, German and Mathematics, LAS

Mentor: Corinne Crane, Germanic Languages and Literatures, LAS

ABSTRACT

This research study explores complex clause patterns across texts written by second language (L2) writers representing different instructional levels from the University of Illinois German language curriculum. The analysis utilizes the linguistic framework of projection within Systemic Functional Linguistics in order to understand the lexico-grammatical resources that L2 learners develop in their writing at different stages of their development. Projection is defined as a logical-semantic relationship whereby a clause functions as a second-order representation of an event, and includes the reporting and quoting of thoughts and speech (e.g., I think that; it is suggested that...; the student said, etc.). Advanced, literate users of a language regularly employ projection as a tool to express multiple perspectives and abstract concepts. This study examines the frequency and communicative functions of projection in texts written by beginning, intermediate and advanced L2 learners to discover how L2 learners express personal thoughts, mark other voices in texts, and attribute factual knowledge to sources. Given its high meaning potential and grammatical complexity, the use of projection in speech and writing can serve as a predictor for increased literacy. The study draws on three sets of narrative texts written by undergraduates at the University of Illinois in spring 2009 and 2010: personal letters from an introductory German course, story continuations from a third-semester course, and fictive letters by students enrolled in an advanced German literature course. Quantitative and qualitative analysis of the data facilitate an understanding of the prototypical realizations of projection in narratives throughout L2 development. This descriptive study will provide the university's German curriculum with important information about how L2 literacy develops

in narrative form. Furthermore, the research will benefit applied linguistics in contributing to the field's notion of advanced literacy in foreign language instruction.

Researching our practice: Writers and their languages

Steven Blumenthal, Junior, Political Science and Spanish, LAS

Nick Martin, Sophomore, English and History, LAS

Erin Dittmer, Senior, English and Political Science, LAS

Michael Shetina, Senior, English, LAS

George Monteagudo, Junior, English and Global Studies, LAS

Ashton Blair, Senior, English and Political Science, LAS

Mentor: Elizabeth Morley, Center for Writing Studies

ABSTRACT

As part of our training to become consultants in the Writers Workshop this year, we have researched the work of tutors and looked at ways writing is used in the university curriculum and beyond. These short presentations highlight our findings. Our methods include surveys, interviews, observations, and written sources. Three of us have examined the ways consultants conduct their sessions with writers. How do our first impressions of our writers matter? How do tutors decide what questions to ask? How do we choose between directive and non-directive strategies? One of us looked at attitudes toward writing within different major fields of study. Another investigated the myth of Standard English and its impact on speakers of some dialects. A last project considered how consultants might be trained to work with multimedia projects.

B.5, Educational Systems: Local and Global Voices (Room 314B)

How much it's a choice, and how much it's situational: A comprehensive study on a dilemma faced by international students

San Seul, Senior, Political Science, LAS

Cheok Meng Fai, Visiting Student

Lam Nga Cheng, Visiting Student

Justin Del Rosario, Freshman, Political Science and Spanish, LAS

Mentor: Lucinda Morgan, Education Policy Studies, EDU

ABSTRACT

Although the Urbana campus of the University of Illinois is a racially diverse campus, international students and local students alike often acquaint themselves with other international students, if not students from the same ethnic background. This is easily observable on campus, where it is rare to see

racially mixed groups in the library, in the bars, and on the streets. International students tend to hang out with other international students. The question is how much of this is due to internal factors (dispositional factors) and how much of it is affected by external forces (situational factors) that drive them to ethnic clumping? What are the factors that cause two individuals to create the social bond of what our society identifies as a friendship and what are the factors that prevent such development? We will conduct a bottom-up research study where we will interview students from four different groups: exchange students (1 to 2 semesters), international students (full-time students who have completed prior education in their respective native country), local full-time students from a rural area with limited experience in traveling within U.S. and abroad, and local full-time students from an urban area with significant experience foreign or domestic. We will first define the interviewee to the four groups, identify the interviewees composition of friends, and explore several significant attributes that might be contributed to the divide: reinforcing cleavages such as language and race; study abroad experience; range of interests; involvement in community activity; and personality. We hypothesize that the strongest attributes that prevent integration between international students and local students is the failure of fluid communication due to language barriers, and racial prejudices that affect the willingness of individuals in both parties to partake in assimilation.

Extraversion in students and economic development in the U.S. and China

Natalie Hann Koepke, Political Science, LAS

Jinyi Ye, Visiting Student

Mentor: Maria Cynthia Anderson, Education Policy, Organization, and Leadership, EDU

ABSTRACT

We study the difference between the amount of extraversion in the U.S. and Chinese societies and how that affects the level of economic growth in the country. First, we observe the difference in levels of extraversion between American students and Chinese students. To do this, we use scholarly research and also implement a small-scale survey of University of Illinois students from the U.S. and China, asking them to rate themselves on how extraverted they believe they are. Second, we use empirical research to find the difference in levels of entrepreneurship between U.S. and Chinese economies. We then report on the relationship between extraversion and entrepreneurship. To supplement our findings we study how this relationship occurs. Finally, because entrepreneurship is often accepted as important to economic development, we present the correlation between extraversion and economic development to show how the difference in extraversion of university students may affect the future economic development in the two countries.

Every child left behind: The contradicting inequalities of No Child Left Behind

Samantha R. Kocher, Sophomore, Elementary Education, EDU
Mentor: Olanipekun Laosebikan, Educational Policy Studies, EDU

ABSTRACT

According to a recent *Chicago Tribune* article, more than half of Illinois public schools were labeled as failing by the federal testing targets of the No Child Left Behind Act (NCLB). Similar reports all over the nation highlight equally alarming statistics, the clear message being that schools are failing. We explore in this study the role of NCLB in fostering racial and class inequalities in K-8 education in the State of Illinois. Our key focus in particular is to identify resources that educators are using to negotiate the inequalities that NCLB has helped to foster. As pre-service teachers we find this to be a very important topic. It is imperative that we identify teachers, schools and communities as change agents, able to understand and address the educational reforms that structure their lives. This research is part of a larger, ongoing project by the James Scholar section of EPS 202 here at the University to using online tools like Wikispaces to create collaborative learning spaces for educators around key educational issues in the state of Illinois. Our research study analyzed key scholarly articles, policy documents like NCLB and other related documents, school report cards in 5 school districts in Illinois and lastly teacher narratives. Our analysis identified key programs and resources being used to negotiate the impact of NCLB on three levels, the state, community and individual. While our research is still in its early stages we are able to offer some conclusions. Our study so far suggests that most of the advocacy against the NCLB is being done on an individual level.

Keeping up with the youth?

Kimberly Anne Jaworski, Junior, Elementary Education, EDU
Yan Yiting, Visiting Student
Chan Fong, Visiting Student

ABSTRACT

Are educational institutions responding to the challenges of teaching and learning in the 21st century and keeping up with the active minds of youth? After the explosion of social media and revealing the power youth has on it through the Egyptian Revolution and its "Facebook Revolution," are the education systems adjusting for the youth of Generation 2.0? This research project will examine this question and focus on Chinese and American cultures. With similar education systems, and the large focus on evaluation through testing, the research will find differences in how the youth utilizes these digital resources in recreation and in educational settings. Different sources will lead the research including scholarly articles, first-hand experience, and interviews with different people across educational and cultural backgrounds. The conclusion will hopefully include an answer to the question and a projected

solution. We will be researching to see if and how schools are adjusting to this new era of technology.

C SESSIONS, 3-4:15 p.m.

C.1, Researching and Engaging Community Health (Illini Room A)

Access to healthcare in a free clinic population: What are the barriers?

Kinnary Desai, Junior, Community Health, AHS
Mary Grace Senseng, Senior, Community Health, AHS
Mohammad Nassaruddin, Senior, Community Health, AHS
Mentor: Stephen Notaro, Kinesiology and Community Health, AHS

ABSTRACT

Accessing health care is a problem for a growing number of Americans. Between 2006 and 2009, the uninsured population in the United States has grown by 3.3 million. The purpose of this study is to determine and prioritize the most prevalent and severe barriers to free health clinic utilization in an under-served area. A questionnaire was conducted that assessed the nine most common barriers to the access of free health clinics in a rural metropolitan area. Survey respondents were asked questions regarding health status, barriers to receiving care, and demographic data. These questions were based on categories that had been identified in previous literature as barriers to seeking health care. Examples of categories were finances, transportation and provider availability. Trends were then observed between demographic characteristics with types and amount of barriers to accessing health care experienced. Results show that finance was the most prevalent barrier that patients encountered. With recent legislation however, the prevalence of this barrier may change. An additional questionnaire would be administered in the future to the same population to study its effect.

An analysis of the impact of hospitals on the health of the community

Hunyah Basathia, Sophomore, Community Health, Health Planning and Administration, AHS
Jessica Hong, Community Health, AHS
Elizabeth Sams, Community Health, AHS
Payal Rana, Community Health, AHS

Evan Marlatt, Community Health, AHS

Symon Shmukler, Community Health, AHS

Mentor: Stephen Notaro, Kinesiology and Community Health, AHS

ABSTRACT

The purpose of this research is to determine the impact of hospitals on the health of the surrounding community by analyzing hospital financial performance measures with health status indicators of the population. Hospitals account for a large portion of health care spending, which is why it is critical to determine if the impact of hospital expenditures positively impacts the health of area residents. This influence will be analyzed by the health of the surrounding community. To assess the health of communities, county health rankings from the literature were utilized. These rankings take into account a variety of measures that impact the health of the population. To determine financial standings of hospitals, various financial performance indicators were tabulated from IRS-990 forms. Key financial indicators, such as a Financial Strength Index, were calculated. Results will yield insight to determine if hospital spending results in healthy communities. In addition, other factors will be analyzed including comparing the health of communities with hospitals to communities that do not have hospitals, total hospital spending, and charitable care. This study adds to the literature by comparing the financial strength of hospitals to the health of the surrounding communities in an attempt to link the activities of hospitals to its impact on the health of area residents.

The high cost of emergency department (ED) overutilization

Megan I. Eiten, Community Health, AHS

Mentor: Stephen Notaro, Kinesiology and Community Health, AHS

ABSTRACT

Much media attention continues to be placed on the fight to achieve access to health care for the 50.7 million uninsured Americans. One common speaking point is overutilization of emergency departments (ED) by this group. Despite the ongoing debate, studies have clearly shown that providing greater access to primary care would not only decrease overcrowding, but could also lead to major cost savings. This study strives to show where these savings could be realized. Employing 2007 National Emergency Department Sample (NEDS) data, the ED usage rate for the uninsured is almost twice that of the insured, with the rate for Medicaid patients at almost thrice that of the insured population. When the rates for each population are multiplied by the average costs, an uninsured visit is comparable to a visit by a privately insured individual. Yet, the average cost for a person on Medicaid was significantly higher than either of the other groups. When looking at the change in the health care system attributable to recent legislation, it is possible to hypothesize the potential cost effectiveness of moving some of the uninsured to private insurance versus others who would be

moved to Medicaid. While almost 20 million people would remain uninsured, 21 million would be moved to private insurance, and 11 million would be moved to Medicaid, placing a greater burden on an already overwhelmed system. When addressing health care costs, it is important to look at not only raw numbers of visits and costs, but differences in insurance status. This is an effective way to determine cost savings from ED visits when attempting to improve the future of the American health care system.

University of Illinois service dog training

Bridget M. Evans, Community Health, AHS

Mentor: Stephen Notaro, Community Health, AHS

ABSTRACT

Service dogs are tools for people with disabilities, just like wheelchairs or crutches. Unfortunately, there are not enough service dogs to meet the demand. In order to introduce more quality trained service dogs into society, we decided to have students at the University of Illinois campus train the dogs. The service dogs in training go to classes, ride the bus, and attend sporting events while learning the commands necessary to be service dogs, such as turning on lights, picking things up, and opening doors. An unbiased third-party interviewed the twenty students who are training the service dogs. The students were asked about their experiences training the dogs, their opinion of the training, and what they have learned about disability laws and culture. We hypothesize that the students are having an enriching experience. Ultimately, our goal is to have the dogs being trained on campus become quality service dogs that are incorporated into society to help people with disabilities.

The use of free health clinics in an underserved population

Christina D. Kim, Senior, Community Health, AHS

Marium Kahn, Senior, Community Health, AHS

Theresa Osunero, Senior, Community Health, AHS

Mentor: Stephen Notaro, Kinesiology and Community Health, AHS

ABSTRACT

The number of uninsured people in the United States rose from 46 million in 2008 to an astonishing 50.7 million in 2009. This population is unable to seek medical care due to the decrease in employment-based health insurance and the increase in the cost of health care. Free health clinics are available in order to ensure access to health care by providing a safety net for underserved populations, ultimately decreasing health disparities among people of different socioeconomic statuses. The purpose of this study is to determine the demographic characteristics of the uninsured people who utilized the free health clinic and the purpose for their visits. Investigators gathered information from over 2,000 hand-written medical records to determine whether the

demographic characteristics and health conditions of the uninsured differed from the general population. No predominate medical condition was observed. In addition to treatment for medical conditions, 1 in 4 patients came for a physical exam. This uninsured population had a significantly higher rate of smoking ($P < 0.01$) and obesity ($P < 0.05$) than the general population. This study adds to the literature by describing characteristics of a free clinic population and their medical conditions. While there was no predominate medical condition in this population, special attention is needed to the prevention of smoking and obesity among the uninsured. This research can contribute to the improvement of a health care delivery system that currently presents challenges in accessing care by low-income and uninsured populations.

C.2, Advances in the Engineering Sciences (Illini Room B)

Tracking cattle movements: Holistic modeling for an animal-based crop rotating system

Athanasia E. Xeros, Junior, Agricultural and Biological Engineering, ENG

Brett Ramirez, Junior, Agricultural and Biological Engineering, ENG

Mentor: Luis Rodriguez, Agricultural and Biological Engineering, ENG

ABSTRACT

Recently, agricultural production has focused not only on the quantity of products but on the quality of products as well, which has led to the success of the locally grown and organic foods markets. The goal of developing a GPS tracking system is to ultimately study the movement and behavior of the cattle to understand the relationship between the grazing rotation, soil quality and animal health. Data collection for this system is being developed currently, starting from an original design of a backpack to the new design of a collar, seeking improvement in new designs in order to optimize comfort for the cattle and data collection. In order to study animal health and temperament, research is being conducted on site, using different training techniques, to minimize grazing disruption and optimize animal health and the well being of the researchers. Using data retrieved, we can simulate different experiments on a computer modeling system to maximize animal health and crop yield. Data simulation is currently in progress.

Chemical erosion studies of lithiated graphite

Andrew Nicholas Groll, Junior, Nuclear Engineering, ENG

Mentor: David Ruzic, Nuclear, Plasma, and Radiological Engineering, ENG

ABSTRACT

Andrew Groll, Priya Raman, Vijay Surla, David Ruzic. Work is supported by DOE/ALPS contract: DEFG02-99ER54515.

Lithium evaporation treatments in the National Spherical Torus Experiment (NSTX) have shown dramatic improvements in plasma performance increasing the viability of lithium as Plasma-Facing Component (PFC) material. In order to understand the complex system of lithiated ATJ graphite, chemical erosion measurements of plain and lithiated ATJ graphite are conducted in the newly built RF plasma facility. A differential pumping scheme is employed and a Residual Gas Analyzer is used for chemical erosion measurements. Target is mounted on a substrate heater (0-500°C) and it is connected to a biasing circuitry to allow for temperature dependent studies and energy dependent measurements. To study the effect of lithium on chemical erosion, lithium is evaporated in-situ onto ATJ graphite. The dominant chemical erosion products are known to be CD_4 and C_2D_2 . The challenges in measuring C_2D_2 , as it interferes with N_2 and CO peaks, are presented. It was found that lithium treatments have suppressed the CD_4 signal, and the effect of lithium on other peaks is presented. The effect of temperature on chemical erosion is under progress.

Integration of continuous testing with unit test repair

Johnston Jiaa, Sophomore, Computer Science, ENG

Mentor: Darko Marinov, Computer Science, ENG

ABSTRACT

In modern software development practices, projects typically include at least three major components: a specification, a system under test (SUT), and a test suite. The specification outlines requirements for the project, the SUT is the actual code for the project, and the test suite consists of unit tests verifying that the SUT satisfies the specification. As projects are developed, the specification continuously changes. Following each change, updates to the SUT are prompt, while updates to the test suite lag behind. To reduce this lag, there are two current solutions. The first, continuous testing, indicates in real time when the SUT does not reflect the behavior required by relevant unit tests. This allows for quickly pinpointing unit tests that no longer correspond with the intended behavior, when the SUT is newly modified. The second, unit test repair suggestion, presents possible fixes that make failing unit tests pass. This automates the tedious, time-consuming, and error-prone process of manually repairing out-of-date unit tests. By merging these two solutions, the friction in updating unit tests could be further reduced. We accomplish this by integrating respective implementations, Infnitest and ReAssert, to provide continuously available unit test repair suggestion.

Developing manufacturing techniques for portable microfluidic "lab-on-chip" devices

Tom Bassett, Senior, Chemical and Biomolecular Engineering, LAS

Mentor: Paul Kenis, Chemical and Biomolecular Engineering, LAS

ABSTRACT

Microfluidics has become an important research avenue that has produced many unit operations which when combined can replicate techniques generally reserved for laboratory settings. Their largest advantages are that they work at a small scale, which decreases the volume of liquids needed, and it allows a large density of reactions to occur in a small area. When combined, these two advantages can lead to many possibilities for practical applications such as pharmaceutical research, where reactants are expensive, or diagnostics where hundreds of tests can be run in hundreds of reaction wells simultaneously. Unfortunately in the current state of development of microfluidic technologies, devices are limited to laboratory settings and have inherent flaws that limit their practicality for large-scale operations. Currently, pneumatics (pressures) are used to control fluid on chips via valves and pumps, however, for each valve, an external control valve connected to both a pneumatic cylinder and a computer are required to operate the valve on the chip. Because each valve on the chip requires an external valve and interfacial connection to the chip, scalability becomes a factor, even for laboratory settings. Here, a new technology of incorporating electrostatic valves into microfluidic chips is investigated. Different types and configurations of electrostatic valves are systematically tested to determine their effectiveness at reaching the overall goal of the project. This goal is to develop a valve that is simply fabricated, scaleable, and capable of operating outside of laboratory settings.

Experimental demonstration of perching by tailless articulated MAV

Joseph Kim, Junior, Aerospace Engineering, ENG

Mentor: Soon-Jo Chung, Aerospace Engineering, ENG

ABSTRACT

There is a growing interest in the aerospace community in the development of Micro Aerial Vehicles (MAV) to learn and mimic avian flight. MAVs with wings equipped with multiple degrees-of-freedom such as flapping, wing twist and sweep provide greater maneuverability than conventional fixed-wing aircraft. MAVs can be used for intelligence gathering, surveillance, and reconnaissance missions in tightly constrained spaces such as forests and urban areas. One of the goals of reverse-engineering avian flight is to learn more about the various aspects of avian flight such as stability, maneuverability and control from the dynamics of MAV. One of the bioinspired maneuvers which is presently of interest is perching. Perching can be described as a high angle-of-attack pull-up with high lift and a large drag. The large lift and drag forces cause the MAV to climb and lose speed significantly, and successfully land on a target location. The control challenge is enhanced by the design of the MAV considered in this experiment. The MAV lacks a vertical tail, but features a novel yaw stability and control mechanism utilizing the dihedral of both wings independently of each other. In the present work, it is proposed that MAVs using a combination

of variable wing dihedral and elevator can perform a satisfactory perching maneuver. Additionally, asymmetric dihedral deflection of the wings can reject perturbations and maintain lateral stability. The off-board VICON motion capture system is employed to extract aircraft position and attitude accurately. The MAV is modeled by splitting into multiple objects, and each articulated parts are tracked for independent motion. Tracking data is used for both real-time, closed-loop experiments in conjunction with MATLAB for calculating aircraft performance. Current results show difficulty in maintaining lateral stability due to high noise readings from VICON. Typical perching maneuvers lasted no more than few seconds, and highly unsteady flight profiles were obtained. Efforts are under way to lengthen the experimental period for early transient behaviors to diminish. The control mechanism based on time-scale separation should be improved to successfully model unsteady flight regimes.

C.3, Understanding U.S. Literature and Culture (Illini Room C)

James Scholar research in American literature

Courtney Ross, Junior, English, LAS

Ryan Richardson, Junior, English, LAS

Katherine Li, Sophomore, English and Political Science, LAS

Paula Bucko, Junior, English, LAS

Margarita Altidis, Junior, English, LAS

Mentor: Dale Bauer, English, LAS

ABSTRACT

These five presenters will show a video of their discussion of their research on 20th-century American literature and culture, and they will offer individual presentations on their research for this panel. This research will include theories of female consciousness, political science and literature, and cultural histories of 20th-century U.S. The first half of the presentation—videotaped before April 12—will give some major background to studying U.S. culture, while the second half will be a live roundtable about pursuing key topics in U.S. cultural studies.

C.4, Women and Children Matter (General Lounge, Room 210)

Feeding America's children: Evaluating the Child and Adult Care Food Program and nutrition in day care centers

Nicholas James Larmore, Senior, Consumer Economics and Finance, ACES

Abigail Holicky, Senior, Community Health, Health Education and Promotion, AHS

Catherine Topolinski, Sophomore, Global Studies, LAS

Mentor: Brenda Davis Koester, Family Resiliency Center

ABSTRACT

Food insecurity impacts millions of American households annually, and one particular group of the US population that is of utmost importance is the children who are affected. Many low income Americans are plagued by the inability to access enough nutritious food at all times to maintain a healthy lifestyle. These limitations and sense of uncertainty has led the United States government to contribute billions of dollars annually to mitigate food insecurity and the negative health and well-being outcomes that accompany it. The Child and Adult Care Food Program is included in this safety net, improving access to food and providing nutritious meals to children enrolled in day care centers and homes. Therefore, we hypothesize that children enrolled in day care centers that participate in the CACFP are more likely to have a nutritious diet. Data was collected from parents with preschool children whose ages ranged from 2 to 4 years that attended licensed Midwest preschools in a three-county area. The survey data was from the STRONG Kids Program's first year of study, and results were collected from 427 participants between spring 2009 and summer of 2010. The questions posed to participants involved their child's daily consumption frequency of a particular type of food. For this study, question numbers 1, 7, 9, 12, and 13 from the survey are used to examine variables including daily intakes of milk, fruit, vegetable, sweets, and salty snacks of each child. Analysis will include descriptive statistics and means for each variable to establish whether there is a significant difference in daily consumption of the given variables between children enrolled in centers participating in CACFP and children enrolled in centers not participating.

Gender and judicial agenda setting: Why women matter

Leslie Barron, Senior, Political Science and Spanish, LAS

Mentor: Donald Greco, Political Science, LAS

ABSTRACT

Studies of the American Judiciary have tended to focus on outcomes and the process of decision making. While this is important, scholars have found conflicting results for the effect of various factors. Gender is one such factor. Literature on the impact of gender and decision-making does not yield strong results. My work will further explore this relationship between sex and judging, but with a new twist. The research focuses on the effect of gender on the agenda setting process in the U.S. Supreme Court. The question I ask is, under what conditions does the gender diversity of justices affect the agenda-setting process of the U.S. Supreme Court? Gender has been significant symbolically in judicial appointment, but does the increasing presence of women on the bench

contribute to any substantive effects? In the Federal Court System approximately 91% of women justices have been appointed since 1970, so this is a relatively new field of study. My research design is based on the analysis of cases selected for the U.S. Supreme Court docket since the 1970s. This time frame allows me to compare three separate cases; an all male bench, a bench with one female, and a bench with two females. Through statistical analysis and comparison of cases selected for the docketed, as well as some cases denied certiorari, I will be able to ascertain any trends over the years in types of cases selected to be heard and denied. With this information it is possible to determine what percent of each docket was devoted to specific issue areas and determine how this correlates with the number of women serving on the bench. The research will also more specifically look at sex discrimination and related cases, and the effect that the presence of women has on this issue area.

POSTER PRESENTATIONS

PA SESSION, 9-10:15 A.M. (PINE LOUNGE)

PA.01. Modified integrative literature review of the relationship between tanning bed use and melanoma

Laura Katherine McKean, Nursing, UIC

Mentor: Teresa Krassa, Nursing, UIC

ABSTRACT

Melanoma, although the least common form of skin cancer, causes the most skin cancer deaths each year (ACS, 2010). The incidence of melanoma increases as age increases, but it is also a cancer that is found in the younger population (ACS, 2010). UV rays have been found to contribute to melanoma (ACS, 2010), and this is of concern for nurses when the population increases its exposure to harmful UV rays through the use of sunbeds and tanning beds. The purpose of this study is to conduct a modified integrative literature review of research literature between 1990 and 2010 exploring the relationship between tanning bed use and the incidence of melanoma skin cancer. The conceptual framework of the study is Dorothea Orem's "Self Care Model of Nursing" (Tomey and Alligood, 2006). When self-care deficit occurs, nursing systems are required to assist the individual in meeting self-care needs through acting, guiding, teaching, supporting, and providing a helping environment (Tomey and Alligood, 2006). The research studies addressed in this study were located using the CINAHL and PubMed databases. Inclusion criteria of the sample were English-language journals between 1990 and 2010. Exclusion criteria of the sample were non-English-language journals before 1990. A convenience sample of ten studies was obtained and analyzed using Ganongs Integrative

Reviews of Nursing Research using descriptive analysis (Ganong, 1987). The findings from this review indicate that there is an increased risk for developing melanoma from tanning bed use. Also, there is a dose-response relationship between tanning bed use and melanoma in that increased frequency and duration of use increases the risk of developing melanoma. Implications for nursing education, research and practice will be discussed.

PA.02. Most effective nonpharmacologic comfort measures for pain management in NICU premature infants: A modified integrative literature review

Andrea Revethis, Nursing, UIC

Mentor: Teresa Krassa, Nursing, UIC

ABSTRACT

A great deal of research has been done investigating the best methods of pain management in NICU premature infants. The purpose of this integrative literature review is to explore what research literature shows as the most effective nonpharmacologic comfort measures for pain management in NICU premature infants. A review of literature was used to examine behavioral responses to different sources of pain, the long-term consequences of pain in preterm infants, and the use of narcotics as a method to relieve pain. Roy's adaptation model was used as the conceptual framework, and Ganong's method was used as the design for this literature review. The target population was premature infants less than 37 weeks gestational age, and all studies were published between 1991 and 2010. Keywords preterm infant, pain management, neonatal intensive care, neonates, procedural pain, facilitated tucking, kangaroo care, oral glucose, infant pain and endotracheal suctioning were searched. Inclusion criteria were that the studies needed to be conducted within the last 19 years. They also needed to be written in English. CINAHL and PubMed databases were utilized. A convenience sample of 10 studies met the inclusion criteria. Random sampling was used. The 10 studies were analyzed using an Article Analysis Summary for Selected Categories. In every study, a minimum of 20 infants and a maximum of 122 infants participated. Both males and females were included. Overall, this literature review found that the use of nonpharmacologic methods, such as facilitated tucking, sucrose on a pacifier, kangaroo care and massage, is more beneficial compared to the use of narcotics in treating pain in preterm infants.

PA.03. American and Russian cooperation on a common enemy

Vince Filicetti, Sophomore, Political Science, LAS

Mentor: Carol Leff, Political Science, LAS

ABSTRACT

The war on terrorism today throughout the world is a massive drain on states' resources. Material power and will of powerful states are being tested by ideological powers of radical Islam, causing conflict throughout the globe. The fact that a majority of the world is fighting a common enemy, however, has not led to adequate cooperation to combat the threat. The best example of this shared foe, but failed cooperation is the United States and the Russian Federation fighting the same enemy: radical Islam. Both the Russian Federation and the United States have been entangled in a seemingly endless trend of asymmetric warfare. There are some differences between the Russian Federation and the United States conflict with radical Islam—Russia in the Caucasus and the United States in Afghanistan—but their overall goals and experiences would appear to be similar. The purpose of this project is to compare and contrast both Russia's and the United States' experiences with Islamic radicalism to analyze first, whether the two states are in fact sharing the same enemy, and second, why apparently parallel experiences have led to conflict of interests rather than cooperation.

PA.04. Determinants of separatist violence

Michael Adam Lopuszynski, Senior, Political Science and International Studies, LAS

Mentors: Matt Winter, Political Science, LAS
Shelley Weinberg, Philosophy, LAS

ABSTRACT

Separatist violence has been a reality of the international system throughout history. Around the world, peoples have sought varying degrees of autonomy or complete independence from a central entity that ruled them. In the 20th century, separatists built on the notion of self-determination—a theme of President Woodrow Wilson's "14 Points" speech near the end of World War I—and have continued to seek the right to rule themselves. During clashes with the state, such peoples may resort to violence to achieve their goals. There are many possible determinants of separatist violence. The purpose of this research is to increase the understanding of the causes of separatist violence. If knowledge of the determinants can be improved, then governments and others who deal with separatists can apply that knowledge to a particular situation and thus avoid the start of separatist violence or prevent the further use of such violence.

PA.05. Survey of the hemoparasites in avian vertebrates of central and southern Illinois

Kendall Leigh Annetti, Junior, Animal Sciences, ACES, and Integrative Biology, LAS

Mentor: Nohra Mateus-Pinilla, Illinois Natural History Survey and Animal Sciences, ACES

ABSTRACT

Avian blood parasites (hematozoa) are potentially pathogenic organisms found in wild birds. Hematozoa infections have been correlated with decreased reproduction and body condition, but no studies have been conducted in Illinois. Our objective was to determine the type, prevalence, and incidence of hematozoa in Illinois avian species. With the aid of IDNR biologists, blood samples were obtained from 8 avian species (n=67) in 12 Illinois counties from April to October. Two blood smears per bird were air dried, fixed, and stained with Diff Quick® (modified from Phalen et al., 1995). Slides were examined for *Leucocytozoon* spp., *Trypanosoma* spp., microfilariae, *Haemoproteus* spp., and *Plasmodium* spp. until 10,000 red blood cells (RBC) were inspected. Parasite intensity was recorded as the number of parasites present/10,000 RBC. *Haemoproteus* spp., *Plasmodium* spp., and *Leucocytozoon* spp. infections were found in 44.44%, 33.33%, and 22.22% of wild turkeys (*Meleagris gallopavo*) (n=9). *Haemoproteus* spp. and *Plasmodium* spp. infections were found in 48% and 7.41% of mourning doves (*Zenaidura macroura*) (n=27). *Plasmodium* spp. was identified in 6.67%, of wood ducks (*Aix sponsa*) (n=15) and *Haemoproteus* spp. in 33.33% of mallards (*Anas platyrhynchos*) (n=3). No hematozoa infections were identified in Canada geese (*Branta canadensis*) (n=9), brown-headed cowbirds (*Molothrus ater*) (n=2), house finch (*Carpodacus mexicanus*) (n=1), or Gadwall (*Anas strepera*) (n=1). Our results were similar to studies in Vermont and Michigan, with variances likely due to our small sample size for some species. This study is valuable for wildlife managers as it indicates that the risk of hemoparasite infection to multiple wild avian species is present and could overlap avian endangered species. Understanding the sylvatic cycle of hemoparasites, and vector-hosts interactions in the context of habitat type and quality could have a significant impact on the survival of native and endangered species guiding current and future restoration efforts.

PA.06. Harvesting methods for exploring DNA associated with language impairment

Esther Faye Thomas, Senior, Speech and Hearing Science, AHS

Mentor: Kenneth Watkin, Speech and Hearing Science, AHS

ABSTRACT

Delayed language development has been linked to later problems with speech, language, reading, and social issues. Children with these difficulties require a significant amount of therapy provided by speech and language pathologists. Early intervention has the potential to improve children's overall outcomes. Recent research has examined different genes that may be linked to specific language impairment (SLI) and reading impairment →FOXP2 (Forkhead box protein P2), CNTNAP2 (Contactin-associated protein-like 2), KIA00319, and DCDC2. Currently genetic studies of communication disorders have focused primarily on children above the age of 4 due to the need for blood sampling. Early detection of these genes at younger ages requires a non-invasive sampling

method. To conduct early gene expression profiling a reliable, stable, and optimal method for extracting oral mucosal DNA material is needed. Reliable DNA analysis requires a sufficient sample to determine genetic expression profile. Devices used to non-invasively extract gene material include: tongue depressor, toothbrush, Q-tip, cytobrush, and sponge. Each method has a different amount of roughness that will exfoliate the mucosal cells from the inner cheek. Previous research compared the tongue depressor with the cytobrush. In this limited test, the cytobrush provided more material for profiling. This proposed research focuses on the determination of optimal, non-invasive methods for harvesting DNA associated with language impairment. The research will compare sputum with the cytobrush, a specially-designed scraper, and a sponge. The results of this research will provide a reliable, repeatable method for gene expression profiling in neonates and young children, and will constitute the first step in a series of experiments examining expression of CNTNAP2 in children less than 4 years of age.

PA.07. Comparing achievement between charter schools and comparable public schools in the same area

Hannah Deutsch, Sophomore, Special Education, EDU

Amy Nadell, Sophomore, Elementary Education, EDU

Pamela Renee Hochwert, Sophomore, Special Education, EDU

Mentor: Sheila Dean, Curriculum and Instruction, EDU

ABSTRACT

The goal of our research is to compare the achievement of charter schools with similar public schools in the same neighborhood. We want to look at the difference between test scores when the schools were just beginning to the most recent test scores from 2010. We will be using online quantitative data. We want to draw on the research previously concluded by the Center for Research on Education Outcomes (CREDO) and by Kevin Booker, who did research on achievement in the charter schools in Chicago, Illinois. We plan on collecting data by going to the Illinois State Board of Education Charter Schools website, where we will read their annual reports, and compare them to a public institution with the same demographics in the same neighborhood. After collecting the data on achievement level from a given charter school's first year, and documenting its level from the year 2010, we will visit another site to gain the same information on the comparison of public schools in the same area. The website that we will use for this information is the Illinois Report Card website. We use statistical analysis to determine the means and averages for the data that we collect from each of the charter schools and comparable public schools. We will also be using this information to determine whether or not charter schools are beneficial, by using the means and averages to see if their achievement has been raised. Ultimately we plan to use our research to discover whether or not charter schools should be acknowledged and promoted as a good way to improve achievement levels for all students.

PA.08. Factors influencing teenage mothers to breastfeed: A modified integrative literature review

Giny Edakkunnathu, Senior, Nursing, UIC

Mentor: Teresa J. Krassa, Nursing, UIC

ABSTRACT

Breastfeeding initiation rates and duration among adolescent mothers are lower than among mothers who are beyond their teen years; however, 13% of all live births in the United States are to women younger than 20 years (Wambach and Cole, 2000). The purpose of this study is to conduct a modified integrative literature review on the research between 1998 and 2010 about factors that influence adolescent mother's decisions to breastfeed. Orem's self-care model of nursing (2003) was used as the conceptual framework for this study. A convenience sample of ten studies meeting the inclusion criteria was located using the CINAHL and PubMed databases. English language research studies dealing with the research problem were chosen. The results indicated that the underlying themes which influence an adolescent mother's decision to breastfeed include: perceived pain, perceived complexity of breastfeeding, inadequate milk supply, and sore nipples. Responsibilities related to school and employment, embarrassment to breastfeed in public, influences of important people in the adolescent mother's life (such as adolescent's mother or partner), opinions of others who have breastfed, and ideas that only the adolescent mother will be able to feed the baby are also major factors that play a role. There were also differences in factors which influence adolescent mothers from different racial/ethnic backgrounds to breastfeed. Implications for nursing practice and nursing education will be discussed.

PA.09. Breaking ethnocentrism, enhancing intercultural connections and understanding

Samuel J. Carey, Sophomore, Political Science, LAS

Mentors: Lucinda Morgan, Education Policy, Organization, and Leadership, EDU; Maria Cynthia Anderson, Education Policy, Organization, and Leadership, EDU; James Geary, Education Policy, Organization, and Leadership, EDU

ABSTRACT

Ideally, we all have a voice; however, sometimes this voice is not heard. Our efforts, culminating weeks of research, surveys, and other means, will provide a framework for effectively reducing some of these barriers caused by ethnocentrism: the idea that one's group/culture/state is superior to others. While exploring the effects of culture shock, an effective presentation will work to exhibit the differences between Western and Eastern cultures, while also showing the ways in which instituted exchange programs can work to develop cooperation and understanding between individuals from across the globe. Specifically, the materials gathered will include: interviews with exchange

and foreign students studying and residing on the campus of the University of Illinois at Urbana-Champaign, surveys, and database research analyzing the effects of exchange programs and the consequences that have erupted from ethnocentrism around the world.

PA.10. The social networks of war: Contextualizing non-state actors in civil conflict

Jared Hall, Senior, Political Science and Linguistics, LAS

Mentor: Colin Flint, Geography, LAS

ABSTRACT

Civil conflict is a devastating, complex phenomenon that affects millions of people across the globe each year. Intrastate violence claims the lives of combatants and civilians alike, and has the potential to cripple nations and destabilize entire regions. As such, understanding and explaining civil war has become a major focus of recent conflict studies. Previous scholarship, however, has been limited by its emphasis of broad, state-centric characteristics, and its ignorance of the various contextual factors that may drive civil conflict. The purpose of this study is to gain insight into the roles that non-state actors play in situations of societal instability and war. By analyzing the networks of social and spatial relations in specific areas of instability, this study investigates how underlying structures of alliance, rivalry, and geography influence the decisions of non-state actors to initiate violent intrastate conflict.

PA.11. The price of childhood obesity: Fries may be cheap, but are they worth your health?

Lana A. Moy, Junior, Interdisciplinary Health, AHS

Risa Umeno, Junior, Interdisciplinary Health, AHS

Collin Gruca, Junior, Social Work, SOCW

Mentor: Amber Hammons, Family Resiliency Center

ABSTRACT

The scope of this study is to clarify whether there is an indirect relationship between socio-economical status (SES) and childhood obesity. In Champaign and surrounding areas, we pulled a sample of 427 children with the average age of 3.12 years, 49.5% boys and 50.5% girls. Their weights and heights were recorded during the three-year survey research program. Data was also taken directly from a survey given to the parent(s) or guardian(s) of the children. We focused specifically on questions regarding educational level, income, body mass index (BMI), and amount of French fries consumed. Some data included parent education, which ranged from some high school education (1.6%) to post-graduate work (31.9%). Family income statistics ranged from \$24,000 (23.3%) to \$100,000 (21.7%). According to the comparison of subcategories of SES, the consumption of French fries and the weight of the children, there is an apparent effect on the weight gain of the child. The SES and its underlying

factors appear to influence the prevalence of varying BMIs in children and ought to be taken seriously when preparing new policies and programs in the Champaign and surrounding areas.

PA.12. Human microbial distribution: A phylogenetic study of biosensors of an individual's health

Suravi Gongulee Thomas, Senior, Molecular and Cellular Biology, LAS

Mentors: Gustavo Caetano-Anolles, Crop Sciences, ACES;

Liudmila S. Yafremava, Crop Sciences, ACES

ABSTRACT

This project is an in-depth phylogenetic analysis of organisms that reside in and on the human body. From this basic analysis we can examine which of these organisms present as human pathogens. Based on the locations and environmental preferences of the organisms, it can be predicted that they will have similar functions and therefore will require the usage of similar proteins. Using this as the point of analysis, one can determine which organisms currently pose a threat to human health and predict possible future human pathogens that evolve in similar mechanisms as those presently found in humans. Identifying which organisms reside on humans is a good indicator of the health of the individual as some organisms are more pathogenic than others for humans. This phylogenetic study can play a crucial role in being a biosensor of human health. It will allow physicians and medical research scientists to anticipate future human disease.

PA.13. An exploration of identity: Immigrant groups in France as portrayed through film

Jenna Tsarpalas, Senior, Global Studies, LAS

Mentor: Margaret Flinn, French, LAS, and Media and Cinema Studies, MDIA

ABSTRACT

This work applies an analytical framework drawn from literatures on identity and community to examine five contemporary French films that focus on issues of immigrant groups in France. By exploring representations of immigrant communities in the films, this research seeks to uncover three major points: (1) how the physical navigation of space reflects immigrants' internal navigation of identity, (2) representation and identity as an act, and (3) the uncertainty of the future of French society with increased immigration. These facets combine to serve the larger question of how immigrant communities are challenging notions of identity. The use of documentary film, documentary-style film, live-action fiction, and animated film, highlights the proliferation of the subject across genres. Because French cinema is a source of national pride, and France has such an extreme climate culturally and politically, it is a natural choice. The French have a history of adamantly fighting to preserve their Frenchness, and therefore is a perfect illustration of how these traditional views are being

challenged. The results can be further generalized to other countries in Europe, with consideration not to over-generalize to the less-volatile situations. The analysis demonstrates that physical navigation mirrors inner struggle, an idea that becomes more complex when discussed in tandem of identity as being a type of performance. The fragile nature of building a façade of an identity is that it eventually is torn down, which is also demonstrated through the uncertainty towards the future of France. It is undeniably difficult to predict, and will likely remain in a precarious position for some time.

PA.14. Fruit and vegetable identification and preference among pre-school children

Jessica A. Torres, Senior, Kinesiology, AHS

Kasey L. Pontarelli, Junior, Human Nutrition, ACES

Katherine Georginis, Junior, Human Nutrition, ACES

Mentor: Dipiti Dev, Nutritional Sciences, ACES

ABSTRACT

Numerous studies have shown that fruit and vegetable consumption among American children is nowhere near the recommended amounts (Dennison, Rockwell, and Baker, 1988; Fox, Pac, Devaney, and Jankowski, 2004). This is despite the fact that between the years of 1970 and 2002 fruit and vegetable availability in the United States was up from 578 pounds to 684 pounds per person a year (USDA Economic Research Service, 2004b). In an attempt to understand the reasons behind low fruit and vegetable consumption amongst pre-school children, our study aims to gain a better understanding over whether pre-school children who are able to identify fruits and vegetables are more likely to consume them and to create a valid yet simple tool to use to recognize which pre-school children are regularly being exposed to fruits and vegetables outside of school premises and which are not. Procedure: The pre-school children were asked to participate in a game or interview with two interviewers. The interview was conducted using 8 x 11 in. colored and laminated picture cards depicting six common fruits and vegetables, four uncommon fruits and vegetables, and four ethnic fruits and vegetables. The picture cards included banana, apple, strawberry, grape, orange, pear, peach, cantaloupe, pineapple, star fruit, mango, papaya, coconut, green beans, peas, carrot, broccoli, corn, spinach, red pepper, eggplant cauliflower, Swedish turnip, okra, avocado, and bokchoy. One interviewer randomly presented a card to the child while another documented whether the fruit/vegetable was recognized, not recognized, or incorrectly recognized by the subject. The interviewer also asked the subject to rate fruit/vegetable as YUCKY or YUMMY. After this portion of the interview, the interviewer laid out the respective cards on table and asked the child to pick out their top three favorite fruits and vegetables and have them say the name as the other interviewer documented what the child said.

PA.15. Are you really listening to what your child's doctor has to say?

Sarah E. Schaefer, Senior, Kinesiology, AHS

Francesca Moral, Senior, Community Health, AHS

Shayda Teymourpour, Junior, Communication, LAS

Mentor: Blake Jones, Family Resiliency Center

ABSTRACT

The objective of this project is to determine how much a health care provider actually influences a parent's actions in healthy food choices, structuring of physical activity and total TV viewing time for their children. Our sample size included Wave 1a and Wave 1b surveys. Data was obtained on how much parents listen to the advice given by their health care providers and their child's fruit and vegetable consumption, TV viewing time, and physical activity. A significant correlation ($p < 0.05$) was found between the health care providers influence with fruits and vegetable consumption and TV viewing time. A non-significant correlation ($p > 0.05$) was found between health care provider influence and physical activity. The results suggest that more research needs to be conducted on figuring out ways for health care providers to more effectively advise parents on issues such as healthy food choices and TV viewing time.

PA.16. Is liberalization occurring in Egypt? An analysis of the political and social effects on Coptic Christians and the Egyptian state

Jacqueline Mary Smerz, Senior, International Studies, LAS

Mentors: Milan Svoblik, Political Science, LAS; Colin Flint, Geography, LAS

ABSTRACT

This project analyzes whether liberalization is occurring in Egypt, as well as its political and social effects on Coptic Christians and the Egyptian state. My hypothesis forecasts that liberalization is indeed occurring in Egypt and that it will have positive effects on Egyptian society and Copts as a whole. Given this context, my project consists of a discussion of the political history of Egypt and Coptic Christians in the last 10 years to see if the literature supports a trend towards liberalization. This paper then analyzes copious amounts of secular newspaper articles to identify if there has been an increase/decrease in protests recorded in the past 10 years. This route is beneficial because active political communities are more susceptible to liberalization. Furthermore, this work examines the recent history of conflict and persecution experienced by Copts through analysis of press reports, studies from various disciplines, and data available from sources such as the Minorities at Risk Project. This is done to determine whether outlining periods of violence against Copts correlate with major protests and provides a foundation from which trends of violence/protest can be established. Finally, my conclusion will be based on the information

provided from my study and also on continued observation of the situation occurring in Egypt at present. Combined, these two elements will give some indication of where Egypt has come from as a nation, where it is likely to head in the future, and where other Arabic nations may follow.

PA.17. Elimination of duplicated bacteria isolates for the study of the effects of microbial community in the host's fitness

Ran Pang, Sophomore, Molecular and Cellular Biology, LAS

Mentors: Manfredo Seufferheld, Crop Sciences, ACES; Chia-Ching Chu, Crop Sciences, ACES

ABSTRACT

The objective of the project is to study the effect of the microbial community on the hosts fitness. The model we have chosen was the western corn rootworms (*Diabrotica virgifera virgifera* LeConte). In order to characterize the microbial community in different western corn rootworm (WCR) populations, we have collected insects from five states in the midwest. More than 200 bacteria isolates were obtained from the guts of these beetles. However, many of the isolates are expected to be duplicated. The aim of my project is to identify bacterial species isolated from the guts of the (WCR) and eliminate duplicated accessions in this microbial collection. In addition, identified bacterial species will be characterized biochemically by accessing their proteolytic activity with different substrates. In this project, 16S rRNA gene amplification (PCR) and sequence will be use to identify individual species and detect and discard duplicated accessions in the collection. The proteolytic activity of the identified species will be determined by culturing them in different substrates such as casein, gluten, and trypsin. The level of protease activity will be calculated by measuring the area of agar discoloring around the colony. In conclusion, knowledge about the composition of the microbial community of the WCR and their proteolytic activity will help us in the understanding of the effects of the microbial community on the fitness and behavior of western corn rootworm. In addition, the elimination duplicated accessions in WCR gut microbial community collection is very important for the efficient use of resources.

PA.18. Do regulated microfinance institutions achieve better sustainability and outreach? Evidence from West African data

Sarah E. Peters, Junior, Economics, LAS

Mentor: Salim Rashid, Economics, LAS

ABSTRACT

Microfinance Institutions (MFIs) offer financial products, including loans and other services, to the poor. MFIs differ from traditional development banks in that they take a market-based approach to lending and use innovative lending

techniques to ensure loan repayment. Unlike other financial institutions, which are subject to entry and prudential regulations, MFIs can be regulated or unregulated. Using data from MFIs operating in West African countries, I develop an empirical model (whose variables are related to bank-specific factors, macroeconomic institutional factors, and regulatory framework) to determine whether regulated institutions have better performance and outreach than non-regulated institutions. Sustainability is measured in terms of operational self-sustainability, or how well an MFI can cover its costs through operating revenues; outreach is measured in terms of number of clients reached. I also include models measuring performance in terms of other economic indicators, including business survival and job creation.

PA.19. Exercise-enhanced learning and memory in male Sprague-Dawley rats through the up regulation of brain-derived neurotrophic factor (BDNF) signaling pathways

Stephany L. Park, Senior, Molecular and Cellular Biology, LAS

Claire Jacqueline Scavuzzo, Graduate Student, Neuroscience Program

Mentor: Donna Korol, Psychology, LAS, Neuroscience Program, and Institute of Genomic Biology

ABSTRACT

Within a health conscious society, lifestyle and proper nutrition has become increasingly more popular. The benefits of exercise are not limited to weight management, combating chronic disease, and improving sleep and mood disorder, but also extend to cognition. Previously we have found that exercise improves both place and response learning, two different types of tasks that tap the hippocampus and striatum brain regions respectively. Exercise also maintains and regulates energy homeostasis in the brain, which is believed to be crucial for the neural mechanisms underlying learning and memory. Exercise may also regulate neural plasticity more directly by upregulating neurotrophin synthesis and release which in turn may promote neurogenesis, synaptogenesis, and synaptic plasticity. Specifically, exercise increases levels of brain-derived neurotrophic factor (BDNF) in brain regions known to participate in learning and memory. BDNF has a high binding affinity for tropomyosin sensitive receptor kinases, in particular the type B (TrkB) receptors. BDNF-Trk B signaling supports neuron cell survival, neuron growth, synapse stabilization, and functional synapse strengthening. Given the role of BDNF in neural plasticity, we wanted to test whether exercise-induced improvements in response learning were due to BDNF signaling through the Trk B receptor. Three-month old male Sprague-Dawley rats were housed in either voluntary exercise or sedentary conditions. Exercise groups were granted free access to running wheels whereas sedentary rats were not. In half of the rats in each group, BDNF signaling was blocked with intrastriatal injections of K252a, a Trk B receptor blocker just before training in response learning task. Results confirm that exercise improved response

learning. Importantly, K252a reversed the exercise-induced facilitation in learning but had no impairing effects in sedentary rats. The data suggests that increased BDNF signaling during learning plays an important role in benefits of exercise on cognition and may point to effective molecular targets for therapies to treat neural disorders shown to improve following exercise regimens.

PA.20. A definite diagnosis with attention deficit hyperactivity disorder

Carolyn Margaret Moran, Senior, Nursing, UIC

Mentor: Sandi Burke, Nursing, UIC

ABSTRACT

The focus of my Honors College Capstone project is Attention Deficit Hyperactivity Disorder, and how to properly diagnose and treat children with this disorder. There is much controversy surrounding ADHD, and many believe that it is not a disorder, as many mental health disorders are perceived. It is also difficult to prescribe children on medications, because not many studies have been done on the effect of these medications on children. My research was a comprehensive review of the literature of articles regarding childhood ADHD. I found articles on different databases, including CINAHL, PubMed, and more. Last year, I read and summarized many of the articles found on those databases. Last semester, I finished a research paper with the results of my findings from previous semesters. The problem that I have found in my research is that there is not a proper diagnosis for ADHD. Many questionnaires and surveys to aid in diagnosis are available, but most parents and teachers are not aware they exist. The questionnaires are very vague, and many teachers and parents do not understand them. What I did over the past two years is a review of the literature to find that proper diagnosis. I have come to the conclusion that there needs to be an improved definite diagnosis for children suspected with ADHD. I would like to summarize my findings in a poster presentation at the research symposium. The poster will have samples of the diagnostic tools available, and ideas for improving the diagnosis of ADHD.

PA.21. Inadequate calcium and dairy consumption in Mexican college applicants

Melanie Ann Mackeben, Junior, Food Science and Human Nutrition, ACES

Mentor: Michelle A. Mosley, Food Science and Human Nutrition, ACES

ABSTRACT

Inadequate calcium and dairy consumption in Mexican college applicants. Melanie Mackeben¹, Michelle A. Mosley¹, Margarita Teran-Garcia¹, UP AMIGOS Group^{1,2}. ¹Food Sciences and Human Nutrition, University of Illinois at Urbana-Champaign, Urbana, IL. ²Facultad de Medicina, U.A.S.L.P., San Luis Potosí, México.

Reliable scientific evidence has revealed the fundamental roles of calcium in bone health, muscle and nerve function, and adiposity. However, reports also show that young adults do not consume adequate daily amounts of this nutrient. We investigated the consumption of calcium and dairy in a sample of 369 Mexican college applicants ages 18-25 (50.4% males) to the Autonomous University of San Luis Potosí (UASLP) in San Luis Potosí, Mexico. Nutrient data were obtained from a Willet food frequency questionnaire adapted for the Mexican population. It was found that 93.4% of 18 year olds and 74.7% of 19-25 year olds were not consuming adequate calcium according to the RDAs of 1300 mg/day and 1000 mg/day, respectively. Altogether, 85.4% of the college applicants did not meet adequate daily calcium intake. Furthermore, 76% of all individuals were not consuming the American Dietetic Association recommended 3 daily servings of dairy. The most frequently consumed dairy foods were whole milk and cheese, with 0.91 ± 0.05 (mean \pm se) and 0.74 ± 0.06 servings consumed daily, respectively. Additional analyses will be conducted to investigate the possible association between calcium and dairy intake and adiposity.

PA.22. Ethical implications of reintegrating former substance abusers into healthcare

Rachel Jamora, Senior, Nursing, UIC

Mentor: Sandi Burke, Nursing, UIC

ABSTRACT

The prevalence of substance abuse in the nursing profession is relatively consistent to the United States population of substance abusers. Unlike the 1980s discipline action for substance abuse, alternative programs offer impaired nurses another chance to redeem their careers in healthcare. The purpose of this study was to conduct a modified literature review to analyze the ethical implications of reintegrating former substance abusers in the healthcare setting. The research literature obtained from 2000 to 2010 was reviewed to learn about the specific criteria for alternative programs and the effects it had on different nurses. Research articles using convenience sampling from PubMed and CINAHL databases were included in this study. The research poster will include the prevalence of substance abuse in specific nursing populations, risk factors, early detection signs, legal consequences, and different types of recovery programs. A literature review will discuss the ethical considerations surrounding reporting an impaired colleague, the expectations as well as the guidelines that must be met by participating in an alternative program, and the retention rates of nurses in healthcare facilities from successful completion in alternative programs. In addition, the research poster will also include background information, research questions, ideas for further research, and conclusions.

PA.23. When legislative activity and district demographics don't match up

Ramsen E. Zacharia, Senior, Political Science and Psychology, LAS

Mentor: Tracy Sulkin, Political Science, LAS

ABSTRACT

Understanding how legislators choose the issues on which to be active, and, in particular why they sometimes introduce legislation on topics that do not seem salient to their districts or states, can shed light on a number of questions of interest to scholars of American politics. Members of Congress are elected to serve their districts and the interests of their constituents. It is thus expected that the legislation they sponsor and co-sponsor will reflect the demographics of their district. Why are MCs sometimes active on issues outside those we might predict based on their constituency demographics? What motivates congressional sponsorship and co-sponsorship of non-constituency oriented legislation? Using data from the 107th and 108th U.S. House of Representatives, this presentation shows how MCs seek to serve the country as a whole as they simultaneously respond to the interests of their district. Legislative sponsorship and co-sponsorship decisions are in fact strategic. The study is organized into the following sections: a review of previous research on the relationship between constituents and legislators, a theoretical explanation of non-constituency oriented legislation, a framework for measuring legislative activity in relation to district demographics, a description of the data, an analysis of the results, discussion and exploration of the results, and a summary that identifies main findings and flaws within the study, and possible directions for future research on legislative behavior.

PA.24. A comparative study of United States and Chinese healthcare systems

BoYa Yin, Junior, Civil Engineering, ENG

Mentor: James Geary, Educational Policy Studies, EDU

ABSTRACT

Healthcare availability continues to be an important topic of discussion in the United States and China. In the United States, recent legislation will give access to health care to those without it. In China the reforms of Deng Xiaoping introduced privatization of many segments of the economy including health care. Broadly, our research aims to determine if health care systems in two similarly dense metropolitan areas in China and the United States, Hong Kong and New York City, are similar. More specifically, we will compare cost and availability of essential health care in these two cities. Looking at essential health care in urban areas becomes more important as the percentage of people living in urban areas increases worldwide. By bringing to light the differences, similarities, successes, and shortfalls of each system, we hope to enrich the discussion around essential health care in each country.

PA.25. Generation XXXL: Parents, what's your role?

Erin Christina Howell, Senior, Communication, LAS

John Karlak, Senior, Communication, LAS

Katherine Reed, Senior, Food Science and Human Nutrition, ACES

Mentor: Blake Jones, Human and Community Development, ACES

ABSTRACT

Children in our society today are exposed to more screen media than any generation before it. Numerous studies (Buijzen et al., Arnas et al., Jordan et al.) have investigated the role that increased screen viewing has on the consumption behavior and nutritional choices of children. While poor eating patterns and choices have been shown to correlate positively to increased media viewing, particularly child-oriented food advertisements on television, the role of the parent in moderating what the child is exposed to and how they interpret the food ads they see on television cannot be underestimated. Our team hypothesizes that the level of interaction on the part of the parent in explaining to the child why the nature of television food advertisements is what it is will have a positive impact on the food choices of the child (i.e., the child will choose healthier foods at home) and the amount of physical activity the child engages in on a regular basis.

PA.26. Tiger mothers

Minjung Chwe, Junior, Agricultural Accounting, ACES

Mentor: Andrea Beller, Agricultural and Consumer Economics, ACES

ABSTRACT

According to the U.S. Bureau of the Census, there are about 114.5 million households as of 2010. About 30 percent of them, or 34.4 million, are households with children. These households must be made of various races, economic status, and other traits. However, there is one thing that all of them have in mind: how to raise their children and raise them well. Asian immigrants in the United States are unique in many respects. One of the uniquenesses comes from Asian mothers. They are believed to raise their children so successfully that parents of other races sometimes wonder how. Often, "tiger mothers" have a high preference of their children's academic goal, and they are very strict with their children about high levels of achievement. Some people say that tiger mothers' teaching methods are improper. In contrast, others say they are appropriate because they bring academic success. Many ideas about tiger mothers are still debatable. This research is about tiger mothers who are very strict in disciplining their children. At the same time, tiger mothers and other Western American mothers, who have different teaching methods, will be compared and analyzed. Also, children's psychological development under these two different education methods will be evaluated.

PA.27. U.S. humanitarian assistance to North Korea

Mari Naganuma, Senior, International Studies and Political Science, LAS

Mentors: Tim Wedig, Global Studies, LAS; Jungwon Kim, East Asian Languages and Cultures, LAS; Paul Diehl, Political Science, LAS

ABSTRACT

My research seeks to analyze the factors that may have contributed to the U.S. fluctuations in humanitarian food aid towards North Korea from 1994 to the present. Mission statements by the U.S. Department of State and USAID mandate the effective use of U.S. foreign assistance resources based on global needs; however, these statements rarely illustrate the outcomes in reality. While international organizations, such as the WFP and FAO, have emphasized the need for food aid in North Korea, the Obama administration continues to halt food aid. My central aim of the project is to determine that geopolitics acts as the central plank for U.S. humanitarian policies toward North Korea (1994-present) by testing three different factors: need, security, and geopolitics.

PA.28. An identification of a Type III polyketide synthase in eucalyptus species

Braden Boone Christian, Junior, Chemical Engineering, LAS

Mentor: Yunzi Luo, Biomolecular Engineering, LAS

ABSTRACT

Eucalyptus species can synthesize a wide array of polyketide natural products, but few of the biosynthetic enzymes have been identified. A gene sequence, which codes for a Type III polyketide synthase (PKS) enzyme, has been identified and sequenced using degenerate primers designed from conserved regions of fourteen chalcone synthase superfamily enzymes. Specific primers were designed for insertion of the gene sequence into a plasmid. The plasmid was transformed into various E. coli strains, and the expression product (the Type III PKS) was purified. Reactions with various coenzyme A substrates were analyzed using HPLC to determine the appropriate substrate for this Type III PKS. The Type III PKS was analyzed with LC-MS to determine if it was a novel Type III PKS enzyme.

PB SESSION, 10:45 A.M.-NOON (PINE LOUNGE)

PB.01. College students' perceptions of rural areas and issues

Richard Ryu, Senior, Community Health, AHS

Nicholas Chmielewski, Junior, Community Health, AHS

Patrick Florido, Junior, Community Health, AHS

Stephen Tulley, Junior, Community Health, AHS

Mentor: Susan Farner, Kinesiology and Community Health, AHS

ABSTRACT

A large number of young people today have no connection to rural areas. In the past, grandparents were the link to rural areas and even this connection has been lost. Without knowledge of rural issues, it is hard for this generation to understand the impact that different laws and regulations have on rural areas. This study assesses the attitudes of college students, most of who are from urban areas, toward rural residents and rural settings. Attitudes toward the population, the living conditions, the resources, and the health of rural residents will be addressed. This information will be used to develop units for college courses that will introduce students to the nature of rural areas and the issues that residents face. The intent of this project is to increase the awareness of these current college students of rural settings to engage more of our future leaders in rural issues even if they are not directly related to the rural areas.

PB.02. Complexity and variability in wheelchair propulsion

Ajith R. Susai, Junior, Kinesiology, AHS

Anna J. Wetzel, Junior, Kinesiology, AHS

Andrew J. Hermann, Senior, Kinesiology, AHS

Mentor: Jacob J. Sosnoff, Kinesiology and Community Health, AHS

ABSTRACT

Andrew J. Herman¹, Ajith Susai¹, Anna J. Wetzel¹, Shawna Culp¹, Higgins Durand¹, Simi Chabra¹, Emily Berman², Zanxi An³, Chandrasekaran Jayaraman³, Scott C. Daigle³, Elizabeth Hsiao-Weckler³, Jacob J. Sosnoff¹. ¹Kinesiology and Community Health. ²Bioengineering. ³Mechanical Science and Engineering.

70% of wheelchair users experience shoulder pain. It is maintained that this shoulder pain results from inappropriate wheelchair propulsion. It has recently been suggested that variability in arm movement is related to shoulder pain in wheelchair users. The purpose of this study is to quantify variations in arm movement during propulsion in experienced and novice wheelchair users. Novice and experienced wheelchair users propelled a wheelchair on a passive roller at a slow, moderate, and fast speed. The motion of the participants' arms and trunk was recorded with a 10-camera motion capture system. Data was analyzed and processed using the Cortex motion capture post-processing program to calculate various joint and segment angles. Experts showed less variability in wheelchair propulsion than novices with more complex arm movement. Variability increased significantly with speed for novices, but only slightly with increasing speed for experts. It was found that there were significant differences in the complexity and variability of the arm motion between expert and novice wheelchair users. Lack of variability in arm swing could contribute to shoulder pain in experienced wheelchair users. Continuing research is being done to determine the influence of variability on shoulder pain in wheelchair users.

PB.03. A psychometric analysis of childhood vocabulary tests

Ellen Bogue, Senior, Speech and Hearing Science, AHS

Mentor: Laura S. DeThorne, Speech and Hearing Science, AHS

ABSTRACT

Vocabulary is a significant and frequently tested component of child language development. Standardized vocabulary measures are utilized by clinicians, as well as researchers, for a variety of purposes, and therefore it is important to recognize the strengths and weaknesses of such tools. Understanding the effectiveness of standardized measures is contingent on knowledge of their psychometric properties. This project reviewed the psychometric properties of 10 standardized vocabulary tests, chosen on the basis of their frequency of use, recency, and availability. Each selected test was then evaluated with regard to its normative sample (recency, size, and representativeness), reliability (internal consistency, test-retest reliability, inter-examiner reliability, and standard error of measure), and validity (developmental trends, comparison to similar tests, group comparisons, and sensitivity and specificity). Of the 10 tests, 4 met all criteria for the normative sample, while no test met each criterion in the areas of reliability or validity. Three tests, the MAVA, PPVT-4, and EVT-2, emerged as particularly strong measures, meeting the highest number of criteria. The area in need of the most improvement was that sensitivity and specificity, even though this is one of the most important indications of a tests validity. Results suggest that clinicians and investigators need to be aware of the psychometric properties of the tests they use, favoring those that are strongest for their specific purpose. However, even when psychometric properties are sound, there are inherent limitations in the function of standardized tests, and multiple forms of assessments are recommended, particularly for high-stakes evaluations.

PB.04. Measuring success in microfinance: Assumptions and realities in Senegal

Jessica Loiacono, Senior, International Studies, LAS

Mentors: Alex Winter-Nelson, Agricultural and Consumer Economics, ACES; Laura Hastings, Political Science, LAS

ABSTRACT

Internationally, the concept of supplying the poor with small loans, or microcredit, as a means of poverty alleviation is becoming increasingly popular. By providing universal availability of credit, the traditional thinking goes, people can engage in small-scale businesses and pull themselves out of poverty. As a result of initial successes, microfinance is now at the forefront of the development discussion. However, little intensive data exists on the success of microfinance on a large scale. The object of my research was to determine whether or not microfinance is successful in reducing poverty in the developing world. More specifically, do

certain characteristics of both lenders and borrowers lead to higher levels of success? I aimed to explore the relationship between successful microfinance initiatives and successful borrower microenterprises. After examining the wealth of current literature on microfinance and impact measurement, I conducted my own research in Senegal. I hoped to learn how micro-lending and small business are transforming individual households and small communities in Senegal by interviewing individual clients. The near thirty surveys I conducted yielded responses that challenge the current notions of microfinance and its supposed overarching success. I conclude that microfinance is an effective tool of development. However, based on variations in loans and borrowers, microfinance does not always improve poverty levels and never does so exclusively.

PB.05. Bedtime TV consumption

Kevin M. Thomas, Junior, Interdisciplinary Health, AHS
Natasha Paris, Senior, Food Science and Human Nutrition, ACES
Mentor: Brenda Davis Koester, Family Resiliency Center

ABSTRACT

The objective of our study is to determine how viewing television—when a child is supposed to be sleeping—affects his/her consumption of fruits, fast food, and salty snacks. The sample size is 414 parents of children between the ages of two to four years. Of the 414 parents, 40-64 caught their children frequently viewing television while they were supposed to be sleeping. These children averaged 1.44 fruits per day and 0.33 servings of fast food per day. There was a significant negative correlation of -0.116 between the number of days parents find their children using the television when they are supposed to be sleeping and the servings of fruits consumed per day by the child. On the other hand, there was a significant positive correlation of 0.235 between the amount of days parents find their children using the television when they are supposed to be sleeping and the amount of fast food consumed per day by the child. Finally, a positive correlation of 0.082 was found between the amount of days parents find their children using the television when they are supposed to be sleeping and the amount of salty snacks consumed per day by the child.

PB.06. Older adults are just as smart as younger adults

Timothy Weng, Senior, Psychology, LAS
Mentors: Monica Fabiani, Psychology and Neuroscience Program, LAS; Gabriele Gratton, Psychology and Neuroscience Program, LAS; Nils Schneider-Garces, Psychology, LAS; Kathy Low, Beckman Institute of Advanced Science and Technology

ABSTRACT

A vast amount of literature identifies changes in brain and cognition as part of normal human aging, which have led to many negative stereotypes about older adults, such as poor cognitive abilities. One of the aspects of cognition that changes the most with aging is working memory (WM), which is a basic system that allows for short-term storage and manipulation of a limited amount of information for short-term use in higher level processing. In the present experiment, sixty older adults, ranging from ages 55 to 89, participated in a working memory task while electrical brain activities, or event-related brain potentials (ERPs), were recorded. For each trial, the participant was briefly presented with a memory set of 2, 4, 6, or 8 letters to be remembered. Following each memory set, participants were given a letter and were instructed to indicate whether or not the letter was included in the memory set for that particular trial. Consistent with previous findings, we found a significant interaction between increasing set size and increasing age. At higher set sizes, older subjects performed much lower than younger subjects, suggesting that as age increases, WM capacity is reached sooner. Thus, older adults can perform well in cognitive tasks that are within their WM capacity. This finding has major implications on how the cognitive abilities of older adults are viewed. For example, older adults are capable of being hired into the workforce to perform tasks that do not overload their WM capacity. To explain why older adults have a smaller memory capacity, we hope to identify what is going on in the brains of adults using the data from the ERPs. We predict to find age-related changes in electrical brain activity.

PB.07. Parental empathic perspective-taking and preschool children's hostile attributions: Parent and child gender moderate associations

Jenna Reid, Senior, Psychology, LAS
Mentor: Nancy McElwain, Human and Community Development, ACES

ABSTRACT

Children rapidly develop social understanding skills during the preschool years, and one aspect of social cognition that tends to be associated with negative outcomes is the child's hostile attribution bias the tendency to attribute hostile intentions to ambiguous peer events. The aim of the study was to examine the degree to which parental empathic perspective-taking was related to children's hostile attributions at 4 (Time 1) and 5 (Time 2) years of age. We also explored whether such associations differed by parent or child gender. Mothers and fathers independently completed questionnaires to assess empathic perspective-taking at Time 1, and child interviews were conducted at both time points to assess hostile attributions. For models predicting Time 1 hostile attributions, partial correlations (controlling for child language) indicated that greater maternal empathic perspective-taking was related to fewer hostile attributions by children, whereas greater paternal empathic perspective-taking

was related to more hostile attributions, but this latter association emerged for girls only. For the models predicting Time 2 hostile attributions, partial correlations (controlling for child language and Time 1 hostile attributions) indicated that more maternal empathic perspective-taking was related to more hostile attributions among boys, whereas more paternal empathic perspective-taking was related to lower levels of hostile attributions among girls. Findings will be discussed in terms of the development of hostile attributions among boys and girls during the preschool period and the differing contributions made by mothers and fathers' empathic perspective-taking to children's hostile attributions biases.

PB.08. Studying the effects of atmospheric pressure on ammonia sensors

Loren A. Anliker, Junior, Agricultural and Biological Engineering, ENG

Mentor: Angela Green, Agricultural and Biological Engineering, ENG

ABSTRACT

Respiratory illness of racehorses following air transport potentially results from poor air quality during transport. Monitoring conditions, such as atmospheric ammonia, during flight may help identify environmental risk factors. Draegar Pac III ammonia sensors measure the concentration of ammonia in an environment by passing an electrical current through a gel that chemically reacts with ammonia. It is unknown how these sensors respond to use on an aircraft. Pressure changes, which occur during flight, may alter the chemical reaction or electronic properties of the sensor and could affect the accuracy of sensor output. The objective of this project was to test these ammonia sensors on an airplane at altitudes of 0 ft. to 12,000 ft. (3657.6 m) and in a controlled pressure chamber. When the ammonia sensors were tested using a standard calibration gas on an airplane, the sensor output was unpredictable at the upper altitudes tested. It was not clear whether these fluctuations resulted from changes in pressure or temperature, effects on the sensors, effects on the calibration cylinder, or some other factor. Subsequently, when the ammonia sensors were tested within a controlled pressure chamber at constant pressures from 0 to -15 Hg (-50.65 kPa), the ammonia sensors worked reliably. During the transitional periods between pressure levels, fluctuations were observed for the ammonia sensor output, prompting additional tests under different rates of pressure change inside the chamber. The results of this project demonstrated that electrochemical ammonia sensors yield accurate results at different pressure levels if the pressure is constant, but fluctuations in pressure cause fluctuations in sensor output. During normal changes in altitude on an airplane, the ammonia sensors will react briefly, then return to normal operation. If desired, a correction equation may be used to predict the rate of ammonia change based upon the rate of pressure change.

PB.09. The effects of processing fluency and goal pursuit

Hanna Y. Chang, Senior, Psychology, LAS

Mentor: Justin Hepler, Psychology, LAS

ABSTRACT

Previous research suggests that processing fluency, which is associated with the amount of difficulty we experience when we process information, can significantly influence our judgments across a broad range of social dimensions. Although fluently processed stimuli are typically associated with greater liking, higher sense of accuracy, etc, a recent study has found that this does not occur when processing fluency interacts with goal pursuit (Labroo and Kim, 2008). Thus, this research proposed that there would be greater motivation and intention to pursue certain goals when presented with disfluent stimuli in the context of goal pursuit. In Study 1, all participants were given two math tests. Participants in the achievement goal condition were told to complete the math tests, while participants in the no-goal condition only briefly looked at the tests. Furthermore, fluency was manipulated using easy-to-read or difficult-to-read fonts. Study 1's preliminary data showed that goal priming increased motivation to pursue an easy goal when participants encountered disfluency. On the other hand, this motivation was decreased in the no-goal condition. In Study 2, participants were given a list of mundane goals ranging from easy to difficult, and rated their intentions and perceptions of each goal. Fluency was also manipulated in the same manner as Study 1. Study 2's preliminary data showed that disfluency decreased intentions to pursue easy goals, yet increased intentions to pursue difficult goals. Our results so far suggest that disfluency and easy-goal interaction results in higher motivation if the goal has been activated, but lower motivation when the goal has not been activated. This research highlights the importance of considering goal attributes when examining processing fluency; fluent is not always favorable.

PB.10. Dopamine, ovarian hormones, and the prefrontal cortex

Alexandria Rebecca Packard, Senior, Psychology, LAS

ABSTRACT

While thousands of perimenopausal women are prescribed ovarian hormone replacement therapy (HRT), the implications of HRT are unclear. Studies have indicated estrogen administered with and without progesterone may cause both cognitive losses and cognitive gains in perimenopausal women and animal models. These discrepancies can only be resolved by conducting further research on the subject of hormone replacement therapy. An important region for cognition is the prefrontal cortex (PFC), which modulates certain aspects of memory, including working memory. Research indicates that, within the PFC,

dopamine innervation is critical for working memory and other cognitive tasks. Determining the effect of different combinations of ovarian hormones on the dopamine innervation in the PFC can help determine if HRT is beneficial or harmful to perimenopausal women. By staining for the rate-limiting enzyme is dopamine synthesis (tyrosine hydroxylase), the present study investigated the effect of different types of hormone replacement therapy on dopamine fiber density in the prefrontal cortex. At middle age (12-13 months), female Long Evans rat were ovariectomized and placed into one of four experimental groups: no-replacement, chronic estradiol, estradiol and progesterone, or estradiol and medroxyprogesterone acetate (MPA). At 19-20 months, animals were sacrificed and their brains were sectioned and immuno-stained for tyrosine hydroxylase. Two slices from each animal were photographed at three different locations per layer (1, 2/3, 5/6), for a total of 18 pictures per animal. The tyrosine hydroxylase fiber density is currently being compared across different groups and different PFC layers. Lower tyrosine hydroxylase fiber densities indicate a decrease in dopamine, which has been linked to working memory deficits. Significant differences between treatment groups would provide more insight as to which combinations of hormones are safe and which are more detrimental to cognition.

PB.11. sRNA-regulated artificial gene circuits in an arsenic-gold bioremediation system

Will Jones, Junior, Biochemistry, LAS

Angela Chen, Freshman, Agricultural and Biological Engineering, ACES

Amanda Chang, Junior, Molecular and Cellular Biology, LAS

Mentor: Chris Rao, Chemical and Biomolecular Engineering, ENG

ABSTRACT

The 2010 Illinois iGEM Bioware team project is composed of two main components: development of bacteria capable of bioremediation and refinement of a bacterial decoder developed by the 2009 Illinois iGEM team. The bioremediation portion of our project focused specifically on heavy metals. To achieve our goal of complete removal of harmful heavy metals, we introduced genes into *E. coli* that make the bacteria resistant to the metals being removed, and also introduced genes that code for metal binding proteins that are displayed on the bacteria's outer membrane. The bacterial decoder portion was implemented using small RNAs and regulatory proteins to regulate the assembly of protein products unique to a certain set of inputs. This regulation under unique, user-specified environmental circumstances is central to making the decoder a novel concept. The system implemented by the decoder consists of different types of logic gates. These were submitted to the Registry of Standard Biological Parts to be used by other synthetic biologists. Our ultimate goal was to incorporate our bioremediation project and our bacterial decoder so that bacteria can be able to isolate specific metals based on their environmental conditions.

PB.12. Titration of arachidonic acid requirement for immune, skin, and intestinal functions

Luis Rolando Muñoz, Food Science and Technology, Zamorano, Honduras

ABSTRACT

The importance of arachidonic acid (ARA) in muscle growth, neurological functions and water skin barrier functions has been established, but the pathology due to insufficient supply of ARA in an early stage of life is not well understood. Delta-6 desaturase (D6D) is the rate-limiting enzyme in the synthesis of highly unsaturated fatty acids such as ARA and docosahexaenoic acid (DHA). D6D null mice are being used to study the specific deficiency of ARA without depleting linoleic acid. A diet lacking D6D products, but supplemented with 0.1% DHA is being fed to (1) determine the rate of tissue specific ARA depletion and (2) determine the relationship of that depletion to pathology. Preliminary results showed that mice fed diets lacking ARA and DHA developed pathological conditions such as ulcerations of the gastrointestinal tract (GI), rapid depletion of ARA in the GI, dermatitis and fatty liver. Based on these results, a future investigation will be carried out in the titration of ARA requirements to allow for appropriate immune, intestinal and skin functions. The results are going to contribute to the development of an effective prevention and/or treatment of ARA deficiency through dietary supplementation of ARA.

PB.13. Save the rural schools: A search for arts programs in rural Illinois

Kirsten Nold, Freshman, Elementary Education, EDU

Mentor: Olanipekun Laosebikan, Educational Policy Studies, EDU

ABSTRACT

Comparisons have often been made about the inequities in arts education programming for suburban versus inner-city schools, but we have rarely looked at the disparities between suburban and rural schools. This research project addresses this issue, and our main question is: what measures are being taken to increase arts programs in rural Illinois schools? Our goal is to uncover the reason why rural Illinois schools lack extensive arts programs, and to determine whether or not anything is being done to establish improved arts programs or initiate new arts programs in rural Illinois schools. This research is part of a larger, ongoing project by the James Scholar section of EPS 202 here at the University using online tools like Wikispaces to create collaborative learning spaces for educators around key educational issues in the state of Illinois. The overall goal is to create a resource base for teachers. Our particular research study analyzes key scholarly articles, state as well as local school district policy documents, in regards to the promotion of arts programming for rural schools in Illinois. We also analyze other key factors like funding or lack of student

interest. Initial results suggest that initiatives and programs that endorse arts programs in rural Illinois schools do exist, but that they have little influence on rural schools decisions to implement arts programs.

PB.14. Spanish and community-based learning

Nina Pesch, Junior, International Business Management, BUS

Lou Schmitt, Junior, Spanish, LAS

Amanda White, Senior, Spanish, LAS

Chris Rivera, Junior, Spanish, LAS

Gabby Pantoja, Junior, Spanish, LAS

Mentor: Ann Abbott, Spanish, Italian and Portuguese, LAS

ABSTRACT

This study will address research and census statistics concerning the growing Latino population in the Champaign-Urbana area. We will be discussing these statistics in accordance with our service learning experiences in Spanish 232 and Spanish 332 and describe how this community based learning affects students in areas such as language skills, cultural knowledge and professional skills. We will compare the learning process that occurs in Spanish 232 and 332 to the learning process that is common in other Spanish and Business classes. We will assess the success of this dual way of learning in which learning in the classroom is accompanied with learning that is enabled from volunteering outside of the classroom.

PB.15. Factors affecting infant mortality rate among underserved populations

Cristina Florig Alagaban, Senior, Nursing, UIC

Mentors: Krista Jones, Nursing, UIC; Sandi Burke, Nursing, UIC

ABSTRACT

The purpose of this paper is to identify and analyze factors affecting the infant mortality rate (IMR) among underserved populations in the United States as well as the effectiveness of federal and local initiatives in reducing IMR, and its implications on nursing practice. Infant mortality is a widely-accepted indicator of the health of a population, and it is influenced by other aspects of health, including maternal health, quality and access to medical care, socioeconomic conditions, and public health practices. In 2006, the IMR in the United States was 6.68 infant deaths per 1000 live births, placing the U.S. 27th compared to other countries. The Perinatal Periods of Risk (PPOR) model is a method that has been utilized in communities with a high IMR. In reducing IMR, the PPOR model has been found to be a useful tool in developing effective interventions targeted towards the weaknesses within the healthcare and community systems. To cost-effectively reduce the IMR, it is critical to examine both maternal and infant risk factors that contribute to infant deaths and utilizing this knowledge to develop and implement initiatives focusing on risk factors most responsible for the high

IMR. The PPOR model, combined with federal initiatives such as the Back to Sleep campaign has been found to be effective in reducing IMR. The research poster will include background information, the research question, literature review, recommendations for further research, conclusions and implications for nursing practice.

PB.16. What do adults know? How generic language shapes children's understanding of speaker knowledge

Dawson John Price, Senior, Psychology, LAS

Mentor: Andrei Cimpian, Psychology, LAS

ABSTRACT

Generic statements express broad generalizations about categories of things in the world (e.g., dogs bark) and are frequently encountered by children. Despite their regular exposure to generic statements, it is unclear what inferences children make about individuals who use generics. In particular, this study will ask, do children assume that a speaker who provides information using generic statements is more knowledgeable than a speaker who provides information using non-generic statements about individuals (e.g., this dog barks)? To determine whether children consider genericity when evaluating speaker knowledge, we introduced 4 to 7 year old children to two puppets who provided novel biological properties about different animals either in generic form (e.g., saying that dogs have keratin in their fur) or in non-generic form (e.g., saying that a particular dog has keratin in its fur). Children were then asked to decide which of the two puppets knew more. Preliminary data indicate that children judged the puppet producing generic statements to know more than the puppet producing non-generic statements. These results indicate that young children use genericity when making inferences about speakers' knowledge which, in turn, has implications for the process of acquiring generic knowledge from other people.

PB.17. Pornography, real or fantasy sex?: Conceptualizing hostile masculinity and hypersexuality in sexual aggressors

Dominique Alexis Malebranche, Senior, Psychology, LAS

Mentor: Dorothy Espelage, Educational Psychology, EDU

ABSTRACT

Numerous studies have examined the prevalence of sexual assault on college campuses. Much research has focused on female victimization and a criminal population of males. However the literature calls for more research on noncriminal aggressors. The aim of the current research is to add to the existing body of literature on sexual aggression, primarily by examining a more contemporary definition of sexualized media through types of pornographysoftcore, hardcore and degrading. The current study will attempt to replicate the attitudinal

pathway of the Confluence Model (Malamuth, 1991) of sexual aggression within a population of college men. Male participants, from a large Midwestern university, will be recruited and asked to fill out an online survey. The survey will include scales that measure hostility towards women, attitudes towards women, rape myth acceptance, consumption of pornography, coercive sexual fantasies, and sexual aggression. Analyses will include a hierarchical multiple regression to determine the extent to which sexual aggression is predicted by hostile masculinity, attitudes supporting aggression, and hypersexuality. The proposed analyses will be utilized to identify which predictor variables account for the most overall variance in the model, and to identify how much of the total variance is accounted for in the outcome variable of sexual aggression. Additionally, consumption of pornography will be tested as a moderator of hostile masculinity, and hypersexuality. We expect to find a linear relationship between the attitudinal pathways of hostile masculinity, hypersexuality, and attitudes supporting sexual aggression, with greater consumption of hardcore and/or degrading pornography. It is also expected that this relationship will have an effect on sexual aggressive behaviors of college men. Understanding these processes may have implications for education and prevention of sexual violence.

PB.18. Morphological analysis of dendritic spines in a mouse model of fragile X mental retardation using live animal, 2-photon microscopy

Shruthi Rao, Senior, Psychology, LAS
8 Georgina M. Aldridge, Beckman Institute

ABSTRACT

Fragile X Syndrome (FXS) is the most common inherited form of mental retardation and is caused by transcriptional inactivation of the *Fmr1* gene, encoding the fragile X mental retardation protein (FMRP). A striking anatomical phenotype in FXS patients, and in a mouse model, is a prevalence of abnormal, immature-appearing dendritic spines. In the barrel cortex, for example, adult *Fmr1* knockout (KO) mice exhibit increased spine density, as well as a higher proportion of morphological spine types characterized by smaller heads and longer necks. These findings suggest that lack of FMRP may play a crucial role in regulating spine maturation and developmental pruning. We used 2-photon, live animal imaging to visualize individual dendritic spines repeatedly in KO mice and analyzed their turnover, size and morphology. Overall, we found a significant increase in the rate of elimination and formation of spines in the KO compared with wild type (WT) animals. We then compared the size and morphology of unstable spines (formed or eliminated over two days) to stable spines (maintained for at least two days). We found that the population of unstable spines had significantly smaller heads and longer neck length compared to stable spines in one-month-old WT and KO animals. This suggests that immature morphology in the KO may be due, at least in part, to the increased

population of unstable spines. Furthermore, the size of unstable spines in the KO was not significantly different from unstable spines in the WT, suggesting that lack of FMRP may alter morphology specifically by increasing the population of these spines, rather than affecting overall spine morphology. Similarly, stable spines were not significantly different in size between WT and KO animals, in agreement with our finding that stable spines had a similar rate of elimination (similar stability) between WT and KO animals. We are currently examining the adult morphology of spines, as previous research has suggested that abnormal spine morphology in the KO is most prominent in adulthood. Finally, we are interested in determining whether adult reintroduction of FMRP using viral vector will specifically reduce the larger population of unstable spines in the KO, or alternatively, whether adult expression of this protein will ubiquitously affect the stability and morphology of all spines. These studies have important implications for understanding the function of FMRP in regulating synaptic development, as well as on the cause of abnormal spine morphology, seen in human patients with many disparate causes of mental retardation.

PB.19. Examining the influence of college community integration on life satisfaction of undergraduate students with physical disabilities

Sarah Sciortino, Senior, Psychology, LAS
Tiffany Wilkinson, Senior, Community Health, AHS
Marta Hitchcock, Senior, Community Health, AHS
Mentor: David Strauser, Kinesiology and Community Health, AHS

ABSTRACT

Our research objective is to examine the influence of college community integration on life satisfaction of undergraduate students with physical disabilities. We hypothesize that college community integration accounts for a larger amount of variance in life-satisfaction of college students with physical disabilities as compared to students without disabilities. College is a crucial time of development in which social and work skills are learned and applied. Current literature on students with physical disabilities is minimal. What does exist highlights work efficacy or work placement success post high school graduation or bachelor degree. Although these are important factors we believe college experience and community integration are critical components to satisfaction of life. We believe higher life satisfaction can correlate with many positive outcomes including: improvement of work efficacy, increased GPA, and high work placement success after graduation. To ensure an equitable selection of subjects for our surveys, the researchers will vary locations of recruitment advertisements across campus. Participants will be separated into three randomly selected groups of twenty people. Individuals will define their concept of the term college community and supply their own definition of their social life on campus as well as answer various qualitative questions. After data collection, the researchers will gather frequencies measuring what

is college community. Then a second round of questioners will be given to three new groups. These research groups will complete the following: a demographic form, our descriptive survey, the community integration scale, and the life-satisfaction scale. DRES at UIUC has acknowledged this research proposal and has provided access to the undergraduate students enlisted in services provided there. Through this research we will be able to gain a more complete understanding of an ignored population. This research can also help us to understand importance of community integration, accessibility, and its relationship with life satisfaction. Provided that college community integration has a significant effect on life satisfaction ratings, we can hold the universities more accountable in providing programs that have the potential to create a better integrated college community more accessible to students with physical disabilities.

PB.20. Components driving the success of social movements

Lauren Dyan Zabrin, Senior, Political Science, LAS

Mentor: Kristina Miler, Political Science, LAS

ABSTRACT

Throughout time, social movements have been outlets for people to unite and rally around similar causes and beliefs to create a better society. Whether it is a group fighting for their rights or those advocating for a certain change of policy, movements have had a major impact on the American government. Even though people have banded together and created movements not all are as successful as others. What is it that makes one social movement more successful than another? In other words, what factors, whether internal or external, contribute to a movement's ability to achieve its policy goals? Currently, different scholars conclude that different factors exist which are key to social movement success. I argue, however, that these factors are seemingly interdependent in the way they work together to contribute to a social movement's success, which also helps explain the previous mixed conclusions. This research will focus, in particular, on mobilization, public opinion, and opponents and how their interaction can define a movement's potential success.

PB.21. Determination of antioxidant capacity of citrus bioactive compounds using oxygen radical absorption capacity-fluorescein assay

Felicia Stefani, Senior, Food Science, ACES

Mentor: Elvira de Mejia, Food Science and Human Nutrition, ACES

ABSTRACT

Pancreatic cancer is the fourth leading cause of cancer death in the United States. The prognosis of this cancer is devastating, with an overall 5-year survival rate of less than 5%. Dietary antioxidant intake from food and supplements has

been linked with a decrease in pancreatic cancer risk and could be effective in preventing pancreatic tumor emergence. Flavonoids, a major group of bioactive compounds found in citrus fruits, have been shown to be potent free radical scavenging and pancreatic cancer inhibiting agents both *in vivo* and *in vitro*. It was hypothesized that there would be an inverse correlation between antioxidant capacity of citrus fruit bioactive compounds, both in purified form and from citrus fruit waste extracts, with pancreatic cancer cell proliferation. The objective of this study was to determine the antioxidant capacity of several bioactive compounds by using the Oxygen Radical Absorption Capacity-Fluorescein (ORAC-FL) Assay and to compare these results with cytotoxicity of those bioactive compounds on pancreatic cancer cells. ORAC-FL assay measured the efficacy of the antioxidant property in each bioactive compound against fluorescein decay in Trolox Equivalent (TE) values. The amount of bioactive compounds present in citrus waste was determined using total phenolic assay. The flavonoid, naringenin, was found to be one of the most potent antioxidants tested in this study with values of 31.5, 58.2 and 133 μM of TE per 2, 4 and 8 μM of pure compound, respectively. In contrast, the flavonoid flavone was found to have no antioxidant ability at concentrations 2, 4 and 8 μM of pure compounds with values of -1.75, -0.44 and -0.49 μM of TE, respectively. In conclusion, these results demonstrated that citrus bioactive compounds varied in free radical scavenging abilities and provided insight into the mechanisms by which they inhibit pancreatic cancer cell growth *in vitro*.

PB.22. Giving the learner control: Exemplar selection in category learning

Robert Molitor, Senior, Psychology, LAS

Mentors: Brian Ross, Psychology, LAS; Erin L. Jones, Psychology, LAS

ABSTRACT

Category learning research has investigated how factors such as the category structure and learning task affect the process of category acquisition. However, previous work has overlooked the role of the learner, limiting the participant's control over their learning by displaying study-items in a random or experimenter-created sequence. This methodology is problematic because people are often able to choose what and how they study in everyday learning scenarios. It is necessary to examine how selecting study-items affects category learning. In two experiments, participants learned complex, artificial categories via a classification task. Experiment 1 compared participants who selected which exemplars they studied (selection learners) to participants who viewed a random sequence of exemplars (random learners). The ability to generalize category information was assessed by typicality ratings and a single-feature classification task. However, because participants in the two learning conditions studied different exemplars, the effects of item-order and the physical act of selection could not be differentiated. Selection learners in Experiment 2 were compared with learners who viewed a yoked sequence of exemplars to attenuate item-

order effects. The ability to generalize category information was tested with a full-feature classification task, as well as a single-feature classification task. It was predicted that learners who chose their own study-items would learn and generalize category information better than learners who did not, because they would be able to strategically choose exemplars to accommodate their learning strategies. Selection learners outperformed both random and yoked learners in the single-feature classification task and had higher classification accuracy than yoked learners in the study phase. The results support the hypothesis that having control over learning and selecting study-items is beneficial to category acquisition, which suggests that utilizing subjective study strategies improves learning.

PB.23. A study of the effects of progesterone in mice models

Dana Theresa Ahern, Junior, Anthropology, LAS

Mentor: Kathryn Clancy, Anthropology, LAS

ABSTRACT

Progesterone and its effects are widely discussed for their potential abilities to aid in medical problems such as post partum depression, premenstrual dysphoric disorder, and even traumatic brain injury. Initial studies indicate that the potential effects and benefits of progesterone treatment could dramatically change the way these medical issues are remedied. Using mice as a medical model, we have begun to explore the effects of progesterone and its potential uses to improve healing and recovery after strokes and traumatic brain injury as well as its role in regulating the mechanism that causes post partum depression (PPD) and premenstrual dysphoric disorder (PMDD). We have begun studies exploring these effects by using progesterone injections on mice and running behavioral tests as well as looking at their receptors for inflammatory cytokines. Initial results have been promising, showing decreased inflammatory cytokine activity after progesterone injections as well as increased activity. Further research is still underway which includes an examination of depressive-like behavior in mice after progesterone injections and a sudden cessation of the hormone. Our findings so far suggest progesterone injections may be beneficial if injected after a certain time after brain injury or stroke. Our findings also suggest progesterone may have a significant role in regulating depressive-like behavior.

PB.24. How many shots do you need to make the grade?

Olivia M. Garcia, Sophomore, Molecular Cellular Biology, LAS

Lily Criscione, Sophomore, Molecular and Cellular Biology and Spanish, LAS

Mentor: Marinos Kalafatis, Molecular and Cellular Biology, LAS

ABSTRACT

Alcohol is a psychoactive depressant, meaning that it slows the nervous system. In small quantities, though, it has the ability to assist people in calming down or in feeling less anxious. If this calming effect can be controlled properly, then alcohol consumption could possibly be applied in order to increase people's performance under pressure. One such stressful activity common in college is taking a test. Thus, drinking might actually increase test performance. For instance, if students were to partake in an activity such as consuming alcoholic beverages before taking a stressful exam, then they might actually do better than if they were to take it with a more elevated anxiety level. Consequently, a research protocol has been developed to test the correlation between alcohol consumption and test performance. In order to conduct the research, numerous college students over the age of 21 will take standardized tests under varying alcohol levels. Our research method will include a comparison among the various subjects to determine how various factors can affect test performance such as gender. Multiple controls have been taken into consideration such as the students' intelligence while sober, their tolerance to alcohol, their weight, and what they had eaten the day of the experiment. Students will consume an amount of alcohol that will be adjusted to their sizes and tolerance levels. Then, they will take a test comprised of a selection of questions from past standardized examinations, such as the ACT. Their performance will be noted and related to how much alcohol they consumed. Multiple runs will be done per student, varying their alcohol levels each time. This topic is relevant to university life, seeing as alcohol consumption is very prevalent among students since many of them use alcohol to relieve stress induced by academics. Through previous experience and speculation, alcohol use is not confined to the weekends. Throughout the weeknights, students can be found in various bars around campus. Although the effects of alcohol tend to hinder academic performance, if used in moderation, drinking may have positive influences on test scores. Since alcohol can serve to relax its consumer, using it before an exam or quiz would help the test-taker to calm down and to think clearly. This experiment intends to test this idea.

PB.25. Are you useful or useless? Brain activity associated with processing of emotionally-valenced language

Daniel J. Frost, Senior, Psychology, LAS

Mentor: Kara D. Federmeier, Psychology, LAS

ABSTRACT

Emotional language (e.g., words like sick, humor) differs from non-emotional language (e.g., book, detail) in both calling to mind positive or negative feelings (valence) and in creating physiological arousal. Understanding the power of emotional language to shape behaviors, thoughts, and feelings requires a better understanding of the independent contributions of valence and arousal

to the brain activity associated with processing a word for meaning. The current study seeks to examine the effects of valence on brain activity while limiting arousal (i.e., low arousal). Electroencephalograms (a recording of electrical brain activity; EEG) were recorded from 19 (11 female, 8 male; age 18-21, M=18.79) University of Illinois students. EEGs enable the identification of brain activity associated with a particular stimulus (i.e., event-related brain potentials or ERPs), which can provide specific measures of cognitive functions such as identifying meaning and accessing memory. Participants were shown series of low arousal positive (e.g., chocolate), negative (e.g., infection), and neutral (e.g., violin) words and asked to either assess their applicability to University of Illinois students or more directly to themselves. Importantly, each word was repeated once to examine differences in processing across exposures. Repetition studies show that the difference in brain activity between the first and second presentations reflects the access of memory and is sensitive to word properties (e.g., word frequency). Consistent with previous studies, brain activity associated with the second presentation was significantly more positive 300-500 ms post-stimulus onset when compared to the first presentation, especially at electrodes over the back of the scalp. Additionally, the observed repetition effect was not sensitive to valence (brain activity for emotional and non-emotional words was similar across both presentations). These findings suggest that, in the absence of high arousal, valence is regarded as a part of words semantic representations and is not specifically distinguished from other semantic features.

PB.26. The impact of acculturation and acculturative stress on dietary habits of Latina immigrants in central Illinois

Melissa Morales, Senior, Food Science and Human Nutrition, ACES

Mentor: Margarita Teran-Garcia, Food Science and Human Nutrition, ACES

ABSTRACT

Latino immigrants present a major public health challenge as they have the second highest prevalence of obesity and related chronic in the U.S. Newly-arrived Latinos are generally healthier than the overall U.S. population, a phenomenon known as the "Latino Health Paradox." Acculturation has been strongly associated with higher rates of obesity. During the last decade, the Latino population increased by 71% in rural areas of Illinois. The Latino Needs Assessment project was developed to assist rural communities in recognizing the strengths and challenges of these immigrants. Our objective was to identify patterns of food intake in relationship to acculturation and acculturative stress. Data were gathered in 5 Central Illinois counties where 112 female participants were recruited for structured interviews. Questions addressed individual, social and contextual factors that affect immigrant families' wellbeing, including acculturation and nutrition measures. The consumption of flour tortillas was associated with language acculturation ($r=0.22$, $p=0.02$); length in the U.S. ($r=0.20$, $p=0.04$); consumption of salty snacks ($r=0.20$, $p=0.04$) and eating

at fast food restaurants ($r=.30$, $p=0.001$). Corn tortilla consumption was significantly associated with fruit consumption ($r=0.25$, $p=0.01$) and stress about giving up cultural practices ($r=0.19$, $p=0.04$). Lower consumption of traditional food products, even when related positively to acculturation, was also associated with unhealthy dietary habits. In order to prevent obesity and obesity-related diseases, it will be important to encourage immigrants to maintain their traditional healthful foods and facilitate the availability of these. Support: IL DHS, Bureau of Child Care and Development, IL Network of CCR, USDA Hatch Act Funds.

PB.27. How does TV really influence our children's eating habits?

Sara Lisa Gillman, Senior, Human Nutrition, ACES

Carla Philizaire, Senior, Human Nutrition, ACES

ABSTRACT

The prevalence of childhood overweight and obesity in the United States has increased dramatically in the past several decades, now reaching epidemic proportions according to the Centers for Disease Control and Prevention and the World Health Organization (CDC, 2004 and WHO, 1998). Childhood overweight and obesity are associated with numerous medical consequences, including type 2 diabetes mellitus and cardiovascular disease, as well as psychological damage, including depression and low self-esteem (Stitt and Kunket, 2008). Research has shown that the vast majority of food advertisements aimed at children are for unhealthy foods including fast food, sugary cereals and snack food, with very little mention of fruits and vegetables (Conor, 2006; Batada and Wootan, 2007; Stitt and Kunket, 2008; Harrison and Marske, 2005; Powell et al., 2007). The next step in research is to discover whether television viewing actually influences children's eating habits. We discovered a positive correlation between children's television viewing and fast-food and sweet consumption and a negative correlation between television viewing and consumption of fruits and vegetables.

PB.28. Disproving prominent stereotypes of Chinese and American cultures

Matthew L. Felty, Senior, Economics, LAS

Teng Teng Lao, Visiting Student

Chan Man Wa, Visiting Student

Kasandra Swanigan, Sophomore, Creative Writing and Communication, LAS

ABSTRACT

What is collectivism? What is individualism? Why are Chinese and American cultures so different? This research will present diverse perspectives on this topic, based on the different backgrounds of researchers. The first objective of this research is to discuss the notions of Collectivism and Individualism. The

second objective is to contend with the common stereotype of China as a collectivist society and America as an individualist society. One example that we identified is the varying marriage dynamics of Chinese and American. Previously, Chinese wives would add the husbands surname in front of their name, but more recently, Chinese women have stopped this practice. American wives, however, continue to change their last names to the husbands. This example shows that the stereotype of collectivism and individualism does exist, and also prompted us to dig deeper into the reasons why Chinese wives stopped adding their husbands' surname to their own, and why American wives still retain the tradition of adopting their husbands' last name. There are several reasons that justify the new Chinese individualist mentality: the divorce rate in China is increasing, the typical Chinese family is becoming more nuclear, and so on. Based on these examples above, we found some academic articles which relate to the ethnographical research of social transition, and thus, the personal opinions about marriage or other topics which will be the major component of our interview. Results generated from the utilization of hard sources such as academic articles, books, newspapers as well as soft sources such as interviews and surveys will attempt to offer new insight into each culture's prevalence of individualist and collectivist ideas, and help to resolve conflict between eastern and western relationships due to the inability to understand the opposite culture.

PB.29. Analysis of neocortical vascular density in a mouse model at various life stages of the Fragile X Syndrome

Ashley Marie Galvan, Senior, Psychology, LAS

Mentor: Roberto Galvez, Psychology and Neuroscience, LAS

ABSTRACT

Fragile X Syndrome (FXS) is the leading cause for intellectual disabilities, and characterized as an absence or severe deficiency of the Fragile X Mental Retardation Protein (FMRP). Previous research indicates a deficiency in FMRP inhibits normal neuron synapse development and maturation. FXS patients typically have structural and functional abnormalities of the brain. Studies suggest the role of FMRP may not be limited to neuron development. Our study investigates if these cerebral abnormalities of FXS patients are related to abnormal cerebral perfusion, and describes the possible relationship between cerebral perfusion and FXS. Previous human studies using various methods, such as electroencephalogram (EEG), magnetic resonance imaging (MRI), and single photon emission computed tomography (SPECT), characterize cerebral abnormalities of FXS patients. EEG show FXS patients exhibit abnormal electrical brain activity (i.e. neuronal communication), such as paroxysmal slow waves. MRI implicates macro structural abnormalities (e.g. underdeveloped brain structures and asymmetrical hemispheres) with FXS. FXS patients typically have abnormal cerebral perfusion, as seen in SPECT data. These cerebral abnormalities seen in

FXS patients might be a result or reflect the role of FMRP. Currently, researchers face the difficulty of explaining the specific relationship between FMRP and cerebral perfusion. The current study examines blood vessel capillary density (BVD) in a FXS mouse model at various ages. In conjunction with previous FXS mouse model research we examine BVD in the visual cortex, permitting a direct comparison with previously published data characterizing neuron abnormalities in these mice. Using a post-mortem collagen type IV stain, BVD were visualized. Initial findings suggest no consistent differences in BVD in young FXS mice, as seen in human FXS imaging studies. We suspect BVD differences may be evident in later stages of life, consistent with human FXS studies. Our study can provide insight in how cerebral abnormalities contribute to other deficits associated with FXS.

PB.30. Keeping up with the youth?

Kimberly Anne Jaworski, Junior, Elementary Education, EDU

Yan Yiting, Visiting Student

Chan Fong, Visiting Student

ABSTRACT

Are educational institutions responding to the challenges of teaching and learning in the 21st century and keeping up with the active minds of youth? After the explosion of social media and revealing the power youth has on it through the Egyptian Revolution and its "Facebook Revolution," are the education systems adjusting for the youth of Generation 2.0? This research project will examine this question and focus on Chinese and American cultures. With similar education systems, and the large focus on evaluation through testing, the research will find differences in how the youth utilizes these digital resources in recreation and in educational settings. Different sources will lead the research including scholarly articles, first-hand experience, and interviews with different people across educational and cultural backgrounds. The conclusion will hopefully include an answer to the question and a projected solution. We will be researching to see if and how schools are adjusting to this new era of technology.

PB.31. Ungoverned spaces, terrorist safe havens, and tribal agency

Richard Dembinski, Senior, Global Studies, LAS

Mentor: Colin Flint, Geography, LAS

ABSTRACT

Frequently touted as imminent threats to global security, the idea of ungoverned spaces being utilized by transnational terrorist groups as safe havens has generated considerable concern in recent years. From Somalia to Afghanistan, the concept of failed states and weakly governed areas serving as ideal sanctuaries for foreign terrorists is prevalent within international security and

policy circles. Although a lack of state presence and control could facilitate the establishment of areas useful to transnational terrorists, this absence does not necessarily create social conditions whereby a foreign extremist presence will be welcomed (or even tolerated) by local kin-based populations. Due to their location within ungoverned spaces, local clans and tribes often have insular political outlooks, with major concerns typically being domestic in nature. Under this premise, what would lead otherwise unreceptive local populations to be supportive of radical groups with global views and aspirations? Through comparison of similar cases in the Middle East and East Africa, the arrival of external military forces into ungoverned spaces can be seen to produce key opportunities for foreign terrorist groups to establish footholds within otherwise inhospitable populations and spaces. From this, it can be seen that local groups which have experienced a foreign military intervention into an ungoverned space are more likely to host transnational terrorist groups than those without an external military presence.

PB.32. Understanding the development of terrorism in Pakistan

Aina S. Niaz, Senior, Political Science and Psychology, LAS
Mentor: Rajmohan Gandhi, Center for South Asian and Middle Eastern Studies, LAS

ABSTRACT

Scholarly work on terrorism often studies the causes for the development of terrorism. David Rapoport, in *The Four Waves of Rebel Terror and September 11*, categorizes terrorism into four waves; and evaluates previous waves of terrorism to the current fourth wave. In describing the current wave, Rapoport notes that this fourth wave of terrorism is a religious wave, in which Islam plays an important role in connection to terrorism. Although some studies on terrorism study religion in connection to terroristic behavior, other academic studies center their research to evaluating other features such as topography and geopolitical-border effects, socio-economic factors, political corruption, institutional setup, and a number of other features which contribute to the growth of terrorism. In this respect, understanding the development of terrorism in Pakistan is an extraordinarily intriguing because many of the debated factors which instigate and foster the development terrorism are present in current day Pakistan. In Pakistan, not only is Islam a dominant religion of the state, but Pakistan currently faces a number of problems such as political corruption, socioeconomic instability, ethno-linguistic conflicts, poverty, topographical features argued to foster terrorism, and other features argued by scholars to play a role in the development of terrorism. Because of this, understanding terrorism in Pakistan is integral to the study of terrorism. Ultimately, this research intends to provide a glance into the various factors argued to be causes of terrorism; and thereby aims to understand the development of terrorism in Pakistan with the hope of gaining significant insights integral to the study of terrorism.

PC SESSION, 1:30-2:45 p.m. (PINE LOUNGE)

PC.01. OSR1 activates Cl⁻/SO₄²⁻-exchange activity of *Drosophila* Slc26a5: *Drosophila* model of kidney stones

Anna Czapar, Junior, Bioengineering, ENG

Mentor: Michael Romero, Biomedical Engineering and Physiology, Mayo Clinic

ABSTRACT

Background: Slc26a5 (Prestin) from non-mammalian species functions as an electrogenic, anion transporter to exchange Cl⁻ for sulfate (SO₄²⁻), oxalate (ox²⁻) or bicarbonate (HCO₃⁻) across the apical membranes of epithelia. This exchange activity has been linked to kidney stones as high urinary oxalate is often associated with Ca-oxalate stones (~70% of kidney stones). Our lab recently developed a *Drosophila* model of Ca-oxalate stones (Hirata, et al., 2009). Since mutations in the human Cl⁻/ox²⁻ exchanger (Slc26a6) do not seem to cause kidney stones, the purpose of this experiment is to determine if exchange activity of *Drosophila* Slc26a5 could be altered by activity of the OSR1 kinase. Methods and results: Copy RNA for *Drosophila* prestin and OSR1 were synthesized in vitro. Prestin, OSR1, and both prestin and OSR1 were injected in *Xenopus laevis* oocytes, and the current response to varying sulfate and chloride concentrations was monitored 3-6 days later. Oocytes injected with prestin + OSR1 cRNA showed an increased current response to the addition of SO₄²⁻ and replacement of Cl⁻. Oocytes injected with only prestin cRNA exhibited lower but a similar response pattern, while those injected only with OSR1 showed no current response to solution changes. Summary: These preliminary data indicate that OSR1 likely serves to increase the activity of prestin while not acting independently as a transporter.

PC.02. Investigating bee bowl color in prairie habitats

Bridgette Moen, Senior, Earth Systems, Environment, and Society, LAS

ABSTRACT

Bee monitoring methods should be tested for their effectiveness to prevent under sampling, especially in habitats that differ from those in the current literature. Ten bee bowls of each color (blue, yellow, and white) were evenly and randomly distributed in nineteen prairies in Illinois. It was determined that the dominant bloom color of a site is not a significant predictor of the number of bees in each color of bee bowl.

PC.03. Delayed auditory feedback and dual-task effects on speech rate

Rebecca Breanne Tibbs, Senior, Speech and Hearing Science, AHS

Mentor: Torrey Loucks, Speech and Hearing Science, AHS

ABSTRACT

Speech rate is an important element in studying the planning and production of speech; it is often used in the examination of stutterers and patients with Parkinson's disease. Several factors can have an effect on speech rate; people speaking under delayed auditory feedback (DAF) are known to have a decreased rate of speech; likewise, simultaneously performing two tasks may also elicit a delay in speech planning and production times. The goal of this studying is to compare the effects of a linguistic task and DAF in people who are normally fluent and their interactions on speech rate. Previous studies have not made clear whether a dual-task influences speech rate to the same extent as DAF. It is also unknown how a dual-task presented concurrently with DAF will affect speech rate. Sixty-three normally-fluent speakers performed reading tasks under four conditions: NAF, DAF, dual-task NAF, and dual-task DAF. Speech rate analysis was performed for each task and correlations were configured. It was determined that speech rate became progressively slower in each task as follows NAF > DT NAF > DAF > DT DAF, which indicates that DAF affects speech rate to a greater extent than a dual-task alone. Gender correlations revealed that females showed a significantly slower speech rate under DAF than males. Otherwise, males and females performed similarly on each of the other tasks. The results will be discussed further in the context of previous work on DAF, speech rate, and dual-task research.

PC.04. Flow modeling of the Connecticut River estuary

Seren Gountanis, Senior, Mathematics and Geology, LAS

Mentor: Bill Smyth, Physical Oceanography, Oregon State University

ABSTRACT

Kelvin-Helmholtz billows, formed from shear flow instability, play a major part in the mixing of adjacent water masses. However, new data collected from the Connecticut River estuary shows that contrary to older models, the main area of mixing in the billow might be in the braid rather than the core. Water covers about seventy percent of planet Earth and its unique properties regulate everything from the nutrients in an estuary to the climate of the Earth, hence, understanding how stratified water mixes is of significance. The Connecticut River estuary was computer modeled using Kelvin-Helmholtz theory to simulate the growth of shear instability into a billow. Observations taken from the Connecticut River estuary provided a basis of comparison for the numerical flow model, allowing the model's predictions to be tested for accuracy.

PC.05. Factors in military spending in the United States and Russia

Karol A. Stadnicki, Senior, Political Science, LAS

Mentor: Paul Diehl, Political Science, LAS

ABSTRACT

Previous studies of military spending in the United States and Russia have focused on military spending during the Cold War, primarily looking at military spending in these two countries from the perspective of an arms race. My study evaluates both Cold War and post-Cold War spending to identify if the factors that drive military spending have changed.

PC.06. No laughing matter: The effects of entertainment news on political knowledge and cynicism

Stephen Schleicher, Senior, Political Science, LAS

Mentor: Jeff Mondak, Political Science, LAS

ABSTRACT

Political communications scholars have studied the effects of entertainment news on the political knowledge of their audiences and have drawn many conclusions. One segment claims that these programs inform citizens who would otherwise completely ignore the political world. This exposure, along with findings of increased interest and participation in politics from viewers, has led some to contend that the effects of entertainment news are positive. Others have found that these programs trivialize political issues and cause audiences to become cynical towards politics. This study looks at the effects of entertainment news by examining their impact on people with different levels of interest in politics. To identify whether these programs serve as useful outlets for political knowledge acquisition or if their content is harmful to citizens and the political process, my objective is to discover whether entertainment news shows help bridge the gap between politically attentive individuals and those with low levels of political interest. I conduct an experiment to discover the effects of these programs on the political knowledge and cynicism towards politics of viewers entering with different political knowledge levels and attitudes.

PC.07. Robust control of crystallisation of L-asp

Min Hao Wong, Junior, Chemical and Biomolecular Engineering, LAS

Mentor: Richard D. Braatz, Chemical Engineering, LAS

ABSTRACT

The optimal control of crystallisation processes bears many implications in the pharmaceutical industry. Basic physical properties of solid drugs such as melting point, particle (crystal) size, distributions, and possible polymorphic variations are critical in determining the performance of solid dosage forms. The bioavailability of drugs with low aqueous solubility and dissolution rate, for instance, is inversely related to particle size distribution (Griffin, 2009). This work seeks to achieve desired (square wave) crystal size distribution and homogenous morphology in a batch crystalliser via optimal control of growth parameters. The basic outline of this approach involves the utilisation of the impinging jet-

glass funnel set up to obtain seed crystals for subsequent crystal growth. A robust feedback concentration(C)-control system is employed on the crystal growth process to achieve ideal distribution profiles. The impinging jet set up uses high speed micromixing of fluids to achieve a homogeneous composition of high supersaturation before the onset of nucleation, and is frequently recognized in the industry today. Recent research done by the Braatz group has established the benefits of employing a concentration feedback control system to follow a solution concentration trajectory as a function of temperature, where this setpoint trajectory is designed to lie within the metastable zone for crystallisation. A C-control approach results in lower sensitivity to disturbances as compared to temperature(T)-control under almost all cases (Zoltan K. Nagy, 2007). Attenuated total reflectance-Fourier transform infrared (ATR-FTIR) spectroscopy coupled with a calibration model constructed using chemometrics techniques was used to provide *in situ* solute concentration measurements. Focused beam reflectance measurement (FBRM), which measures *in situ* the characteristics of crystal size distribution, was used to detect the metastable limit for the seeded system.

PC.08. Robust control of protein purification

Pui Yin Tham, Junior, Chemical Engineering, LAS

Min Hao Wong, Junior, Chemical Engineering, LAS

Mentor: Marina Miletic, Chemical and Biomolecular Engineering, ENG

ABSTRACT

Peptides are amino acids which form hormones, neurotransmitters, or antioxidants instrumental to maintaining the proper functioning of bodily systems. Artificially manufacturing peptides is currently inefficient, expensive, and inconsistent. Mutations in bio-reactants and enzymes during synthesis and chemical reactions decrease yield and purity. To address safety and quality concerns, considerable time and expense is devoted to purification and testing prior to protein assembly. Peptides which do not have the correct sequence of amino acids need to be separated and disposed, which is costly and time consuming. Current methods for purity tests include chromatography, radio-immuno assays, electrophoresis, etc., with the latter most commonly employed (Myerson, 2002). Unfortunately, besides being pricey, many of these methods are not quantitative. Indeed, chromatography procedures used in pharmaceutical production are too costly for the production of larger polypeptides (Hofman and Thonart, 2001). Furthermore, purification techniques are often not selective and do not consider that some mutations are essentially benign. Another significant expense in the production of medicines lies in the usage of batch reactors because they allow for the highest quality and purity. These reactors require regular filling, emptying and cleaning cycles, which slows production considerably. Recent research demonstrates that the number of patterns of amino acids in a peptide chain (i.e., motif) for some naturally occurring proteins can be easily identified. Select motifs could mutate more than others, allowing better

measurements and predictions using a unique alignment-free approach. This project seeks to apply these findings, coupled with contemporary microfluidic and protein-sequencing technologies to propose a novel and cost-effective design for peptide quality control. One possible design involves establishing a microfluidic mechanism to separate peptide chains continuously based on solubility differences, thereafter purifying protein using phase separation. An alignment-free approach is utilized to provide quantitative measurement of peptide purity. This mechanism could significantly reduce downtime and production costs in pharmaceutical and medical industry today.

PC.09. The effect of the time of weaning on efficacy of the CO-Synch + CIDR estrus synchronization protocol

Emily Carson, Animal Sciences, ACES

Mentors: Dan Faulkner, Animal Sciences, ACES; Frank Ireland, Dixon Springs Agricultural Center, Animals Sciences, ACES

ABSTRACT

The effect of the time of weaning on efficacy of the CO-Synch + CIDR estrus synchronization protocol. Kesler, D.J., Faulkner, D.B., Ireland, F.A., Retallick, K., Carson, E.M.

The beef cattle industry requires improvements in breeding management that facilitate the use of artificial insemination (AI). In conjunction with AI, estrus synchronization is an important tool in the reproductive management of beef herds. Commonly, cows that are synchronized for estrus are still suckling a calf. Suckling has a negative impact on LH release. LH is a hormone necessary for follicular development and ovulation. An increased release in LH, due to earlier weaning of the calves, may improve the quality of the follicles and improve pregnancy rates. Therefore, weaning three days earlier could improve the efficacy of estrus synchronization. This study evaluates the effect of time of weaning on the efficacy of the estrus synchronization protocol. Beef cows were synchronized using the commercially used CO-Synch + CIDR protocol. For this study, calves were weaned at the time of CIDR removal or the time of AI. Between 54 and 66 hours after the CIDR is removed, cows were artificially inseminated using well-accepted standard practices and concurrently administered GnRH. Beef cows were synchronized using the well established and commercially used CO-Synch + CIDR protocol. Cows were artificially inseminated using well-accepted standard practices. In order to evaluate the effect of the time of weaning, calves are weaned twice: 1) at the time of the CIDR removal and 2) at the time of AI. Approximately 60 days after timed AI, cows are examined for pregnancy status. The results of this study showed that of the cows whose calves were weaned at the time of AI, 46.67% became pregnant to the AI. Of the cows whose calves were weaned at the time of CIDR removal, 59.04% became pregnant to the AI (standard error: 0.03, $P < 0.01$).

PC.10. Maternal parenting and eating habits: Does matriarchal influence play a factor in children's eating behaviors and weight gain?

April A. Moore, Senior, Health Communication, LAS

Adina Hattar, Senior, Food Science and Human Nutrition, ACES

Laurie Penalber, Senior, Speech and Hearing Science, AHS

Mentor: Anne Bostrom Bailey, Family Resiliency Center

ABSTRACT

The role of maternal parenting on a child is a primary factor in child development. After reviewing the STRONG Kids survey, we noticed that women (mothers, primary caretakers, etc.) comprised the majority of the parents who completed the survey and thus had a central effect to their child's nutritional development. Our research aims to find a correlation or causation (or lack thereof) between maternal involvement and the eating habits of the offspring. More specifically, we would like to further research the parenting styles of mothers and how those parenting style affect the food choices offered by the mother to the child. For example: Do passive-aggressive mothers allow their children more fast foods and/or sugar snacks or healthier food choices such as fruits and vegetables? This topic has sound research behind it and our group would like to further extrapolate this information to have conclusive evidence behind our hypothesis. The method used for this study comes from the STRONG Kids study, which included surveys taken from 427 families in the first out of three years of planned research. Survey data collection was conducted from Spring 2009 to Summer 2010.

PC.11. A new model to study mechanical movement in chemoattractant sensing of neutrophils

Jaclyn Spitz, Junior, Bioengineering, ENG

Mentor: Ashish Kapoor, Chemical and Biomolecular Engineering, LAS

ABSTRACT

Neutrophils constitute the largest class of white blood cells and are the front line of cellular immune defense. They are able to sense and migrate upstream of concentration gradients of chemoattractants within the body. Research constantly aims at replicating *in vitro* the factors that influence the migration of neutrophils. These factors include interactions with other cells, interactions with the extracellular matrix, and systemic factors. The goal of this work is to specifically examine the response of neutrophils to mechanical cues encountered in their movement. We use microfabrication methods that make it possible to craft microfluidic devices that mimic *in vivo* microenvironments in order to gain insight into neutrophil chemotaxis behavior. These platforms can be tailored to include physical barriers that the neutrophils encounter when moving up the concentration gradients. The specific design is an array of microposts situated

within the microfluidic gradient channel that impede cell movement. The spacing and placement of the posts inside the channel can be changed to study the role of geometric interactions during chemotaxis. This microfluidic platform reported here allows us to investigate how cells respond to mechanical blocks and incorporate those mechanical signals with the chemoattractant-sensing signaling machinery in order to readjust their direction. The experimental data reveals that neutrophils sense their path up the concentration gradient after experiencing a temporary mechanical disturbance. The influence of the microposts on the cellular movement up the gradient will improve the understanding of the effects of mechanical stimuli on neutrophil chemotaxis.

PC.12. Fermentation of blueberries and the inhibitory capacity of starch degrading enzymes

Tessa L. Meyer, Senior, Food Science and Human Nutrition, ACES

Mentor: Elvira de Mejia, Food Science and Human Nutrition, ACES

ABSTRACT

Berries are known for their bioactive compounds that benefit human health including management of diabetes. Fermentation is known to increase antioxidant capacity of blueberry juice. The objective of this study is to determine the effect of temperature for blueberry fermentation on total polyphenol content, antioxidant capacity, and inhibitory capacity of alpha-glucosidase and alpha-amylase. A berry juice was made from several *Vaccinium corymbosum* cultivars from the Dixon Springs Agricultural Center in Southern Illinois. Fermentation was conducted at room (RT, 20-22°C) and cold temperatures (CT, 4°C) using *Saccharomyces bayanus*. Brix, pH, total polyphenols (TP) as gallic and ellagic acid equivalents ($\mu\text{g}/\text{mL}$ GAE and EAE), and antioxidant capacity using the ORAC assay in mmol/L Trolox equivalents (TE), were measured four times throughout the fermentation process. Reducing sugars were removed to measure alpha-amylase and alpha-glucosidase activity, which was expressed as percent relative inhibition to acarbose, a known inhibitor. Fermentation led to an overall decrease in pH (6.29 to 3.79 for RT; 4.50 to 3.75 for CT), Brix (29.7 to 13.6 for RT, 26.3 to 20.0 for CT), an overall increase in TP (228.3 $\mu\text{g}/\text{mL}$ GAE for RT and 66.5 $\mu\text{g}/\text{mL}$ GAE for CT) and ORAC (2.1 mmol/L TE for RT, 5.9 mmol/L TE for CT). Both the juice and the fermented blueberries had a slightly greater inhibition of alpha-glucosidase (13% inhibition/g GAE) than acarbose. However, fermentation increased alpha-amylase inhibition 144% above acarbose. CT fermentation produced less ellagic acid and more antioxidant capacity than RT, with important implications to wine quality. Blueberries and their wine, especially when fermented at cold temperature, make an ideal natural source for antioxidants and potential inhibitory factors of starch-degrading enzymes.

Tessa Meyer¹, Michelle Johnson¹, Jeff Kindhart², and Elvira de Mejia¹. ¹Division of Nutritional Sciences and Department of Food Sciences and Human Nutrition, University of Illinois at Urbana-Champaign, 228 ERML, 1201 W. Gregory Drive, Urbana, IL 61801. ²Dixon Springs Agricultural Center.

PC.13. An examination of the effect of different intensities of exercise on affect and enjoyment

Annie M. Nekoliczak, Senior, Kinesiology, AHS

Mentor: Steven J. Petruzzello, Kinesiology and Community Health, AHS

ABSTRACT

This study will examine the role of exercise intensity in exercise enjoyment. It is thought that exercise intensity is a key factor in exercise enjoyment. There is also an innate connection between exercise enjoyment and increasing adherence to exercise programs. The potential for increased levels of exercise serves to provide exercisers, especially beginning exercisers, with the health benefits associated with regular exercise. Each subject (n=30, ages 18-30) will participate in a graded exercise test to determine his/her maximal aerobic capacity and ventilatory threshold (VT). After completing the graded exercise test, two exercise intensities will be calculated based on the ventilatory threshold. One intensity will be 20% below oxygen uptake corresponding to VT (below VT condition), and the other will be 10% above VT (above VT condition). The subjects will then participate in two more sessions. During one session the subjects will exercise for 15 minutes above their VT, and during the other session, subjects will exercise for 15 minutes below their VT. Throughout both sessions, subjects will be asked to rate how they feel using the Feeling Scale (FS), Felt Arousal Scale (FAS), and Rating of Perceived Exertion Scale (RPE). They will be asked to rate their FS, FAS, and RPE during the last 15 seconds of minutes 3, 6, 9, 12, and 15 of their exercise. After completing the exercise, subjects will be asked to complete the Physical Activity Enjoyment Scale (PACES) in order to rate enjoyment. All subjects will be called two weeks after completing the study to see if they have started to engage in a regular physical activity program. The findings of this study will possibly provide evidence to help in the development of more effective exercise prescription by determining how people feel at varying exercise intensities and how much they enjoy such intensities.

PC.14. An exploration of the role and future of the arts: A case study of Portland, Oregon

Ashton McCrate, Senior, Recreation, Sport and Tourism, AHS

Mentor: Carla Santos, Recreation, Sport, and Tourism, AHS

ABSTRACT

It is believed that when art is engrained in a community, local residents can benefit from experiencing a higher quality of life and more satisfying relationships with others (Carpenter and Parr, 2005). Arts can also have a significant impact on the local economy. The purpose of the current study, therefore, is to better understand how the context of a community affects the way arts are both perceived and integrated into local society. Through an examination of art-focused Portland, Oregon, this study seeks to understand

the role of the arts in a community, as well as how the arts are affected by other environmental factors. To do so, it explores the contemporary demographics, education, geography, technology, and social and cultural factors present in Portland, Oregon, so as to determine strengths and weaknesses of the local community arts, as well as to gain an understanding of factors that may have positive or negative effects on the arts and its surrounding communities in the near future.

PC.15. The effects of moderate aerobic exercise training on inflammatory status of the colon during acute ulcerative colitis

Collette L. Williams, Junior, Molecular and Cellular Biology, LAS

Mentor: Marc D. Cook, Kinesiology and Community Health, AHS

ABSTRACT

Inflammatory bowel diseases (IBD), such as ulcerative colitis (UC), significantly reduce physical functioning and decrease the quality of life in afflicted patients. Preliminary studies show that moderate intensity exercise training reduces the symptoms and disease activity of IBD, improving quality of life in these patients. Local inflammation in the periphery results in inflammation within the brain to alter behavior. The purpose of this study was to understand whether exercise reduced inflammation and sickness behavior associated with colitis using a mouse model. UC was induced by dextran sodium sulfate (DSS) treatment in treadmill exercised (8-12 m/min. for 6 weeks–5x/week) or sedentary C57Bl/6 male mice (n=13/group). DSS was given at 2% in drinking water over 5 days. Sickness behaviors were assessed by changes in food and fluid intake, body weight and locomotor activity. Mice were euthanized and colons were harvested at disease peak (Day 8) for analysis of pro- and anti-inflammatory gene expression. Surprisingly, we found that 6 weeks of prior exercise training caused intensified local inflammation of the colon as measured by significant ($p < 0.05$) increases in IL-6, IL-10 and TNF-alpha gene expression. While DSS-treated mice exhibited reductions in food and fluid intake, body weight, locomotor activity when compared to the water-only group, prior exercise training did not exacerbate these symptoms associated with colitis. In conclusion, exercise appears to exacerbate local inflammation but this effect does not alter symptoms associated with colitis. We are in the process of examining brain cytokines and the histology of the colons to address this paradox.

PC.16. The impact of father involvement on children's later social-emotional outcomes

Margaret Ann Tunney, Senior, Human Development and Family Studies, ACES

Mentor: Brent McBride, Human and Community Development, ACES

ABSTRACT

The purpose of this study is to examine the relationship between early father involvement and children's later social-emotional outcomes. The sample was pulled from the Early Childhood Longitudinal Study Birth (ECLS-B) data set, which is a nationally representative sample of children born in 2001. The children come from diverse socioeconomic and racial/ethnic backgrounds and were evaluated at four time points from birth through kindergarten. The evaluations are composed of information obtained from children, their parents, childcare providers, and teachers about development in multiple domains. From these data, a sample of 3,750 children and their families was used. The fathers' participation was assessed using five dimensions of early parental involvement including functional, play, literacy, responsive care giving, and decision-making. Children's social-emotional outcomes were developed evaluating impulsivity, prosocial behavior, and externalizing behavior.

PC.17. Body mass index and validity of self-reported body size among Mexican young adults

Jilber Alexander Jerman, Junior, Community Health, AHS

Mentor: Flavia Andrade, Kinesiology and Community Health, AHS

ABSTRACT

There are important health consequences for individuals who misperceive their own body size. Lack of knowledge of one's own body mass index (BMI) could lead to eating disorders. The goals of this study are to 1) assess the level of agreement between perceived (self-reported) and measured BMI among a population in México and 2) evaluate whether differences of agreement correlate with age, gender and socioeconomic status. Applicants to the Universidad Autónoma de San Luis Potosí, México, in 2009 aged 18 to 20 ($n = 2,966$). Participants self-reported their BMI categories and measured BMI was obtained during medical physical screenings. Men had higher BMI than women ($p < .001$). Among men, 33.9% are overweight or obese, but only 16.7% self-reported being in these categories. Among women, 28.3% were overweight or obese, while 21.7% self-reported these categories. Agreement between perceived and measured BMI was lower among men ($Kappa = 0.22$) than among women ($Kappa = 0.45$). Women were less likely to underreport than men ($RRR = .48$, $p < 0.001$), but they were 1.47 times more likely to over-report ($p < 0.05$). Women in the U.S. and other Western societies have a high rate of over-reporting BMI when compared to males. In this sample, women reported their BMI categories generally more accurately than men. However, women were more likely to over-report their BMI category. As a result, Mexican women may be at risk of developing risky health behaviors to control their body size. Keywords: body mass index, validity, perceived body size, Mexico.

PC.18. Women, health, and context: Understanding the health behaviors and health attitudes of women of color

Quianna Tillisa Hart, Senior, Community Health, AHS

Laura Myers, Junior, Community Health, AHS

Mentor: Angela Rose Black, Kinesiology and Community Health, AHS

ABSTRACT

Despite national efforts to decrease health disparities between members of ethnic minority and majority groups, chronic illnesses, related complications, and consequent deaths remain prevalent among women of color. The Centers for Disease Control suggests that African American, Latina, and Asian American women are more likely than Caucasian women to die from the leading causes of death among women: heart disease, cancer, and stroke. Several explanations have been offered to explain these health outcomes: barriers to quality healthcare, lack of health knowledge and awareness, and limited cultural competence of health practitioners, for example. However, we still know very little about the health behaviors and health attitudes of women of color that lead to the onset of chronic illness. Moreover, additional insight is needed on the contextual variables (e.g., home, work, and community) that influence these health behaviors and health attitudes. This poster will address the major health behaviors and health attitudes that are being targeted in health interventions for women of color. Highlighted within these findings will be interventions that examine the health of women of color in the context of families and communities. The information gathered will inform a book chapter in a new handbook, *The Handbook of Race-Ethnicity and Gender in Psychology*. Resource sheets detailing books, websites, and films relevant to heart disease, cancer, and stroke among women of color will be available.

PC.19. Emotional styles, distress, and voluntary and involuntary attention to emotion

Shanshan Huang, Senior, Psychology, LAS

Mentor: Howard Berenbaum, Psychology, LAS

ABSTRACT

This study examines how individuals' different styles of emotional processing are associated with worry and depression. Previous research has found that individuals with an overwhelmed emotional style (low emotional clarity and high emotional intensity) report paying above average attention to emotion, yet they have been found to avoid emotional information. The present study attempted to solve this paradox by proposing the need to distinguish between voluntary and involuntary attention to emotion when examining the relation between emotional styles and worry and depression. University students ($N=166$) completed various questionnaires that measured different facets of

their emotional experience as well as their levels of worry and depression. In addition, participants completed two behavioral tasks (the dot probe task and the recognition task) that assessed their voluntary and involuntary attention to emotion. Current research found that individuals with a hot emotional style (high emotional intensity and clarity) displayed elevated levels of worrying as well as high voluntary and involuntary attention to emotion, while at the same time having low levels of depression. On the other hand, individuals with a cold emotional style (low emotional intensity and clarity) displayed diminished levels of worrying, voluntary and involuntary attention to emotion and at the same time exhibited elevated levels of depression. Moreover, individuals with a cerebral emotional style (high emotional clarity, low emotional intensity) were found to have diminished levels of worry, depression, and involuntary attention to emotion while at the same time possessing high voluntary attention to emotion. Finally, individuals with an overwhelmed emotional style displayed elevated levels of worrying, depression, and involuntary attention to emotion, while having low levels of voluntary attention to emotion. The present findings indicate that different styles of emotional processing may be important for understanding the development of different patterns of psychological distress.

PC.20. A comparison of rural, urban, and suburban charter schools

Lauren R. Donoho, Sophomore, Elementary Education, EDU

Mentor: Sheila Dean, Curriculum and Instruction, EDU

ABSTRACT

Charter public schools have received a great deal of attention recently in the United States. A charter public school is a non-religious public school operating under a contract or charter that governs its operation. Charter schools have evolved over about two decades as a way to experiment with education innovations and provide public school choice. Charter schools are similar to public schools in that they are publicly funded; they may differ from public schools in their organization, curriculum and instruction, support programs, etc. There are currently thirty nine states with charter school laws, with a total enrollment of about one and a half million students, and the current U.S. Department of Education is promoting charter schools as a major route to school improvement. A fair number of recent studies of charter schools compare their performance with the performance of students in traditional public schools. Typically, however, little attention is paid to the actual education programs offered in charter schools, even though the purpose of charter schools is to use their freedom from the traditional structure to create distinctive schools. This study addresses the question: How do three specific charter schools, located in different geographic areas, provide their students with customized educational experiences? The methodology used for this study is the development of in-depth case studies of three specific charter schools, one in a rural area, one in a suburban area, and one in an urban area, using data from the school websites

and other publicly available data sets, as well as interviews with a representative from each school. This study provides an in-depth perspective on charter school innovation, which is generally lacking in the current research literature, especially with regard to non-urban charter schools.

PC.21. Motion planning for a planar elastica

Rasheed Ibrahim, Junior, Aerospace Engineering, ENG,
and Applied Mathematics, LAS

Mentor: Timothy Bretl, Aerospace Engineering, ENG

ABSTRACT

Our work studies the deformation and stability of a slender elastic rod (also known as a planar elastica). We consider the problem of finding the minimum energy paths for an elastica that has one end point clamped to the end-effector of a robot manipulator and its other end point clamped to a mounted end-effector in the workspace of the robot manipulator. We introduce an optimal control algorithm that enables the robot to deform the planar elastica from a given configuration to another. Furthermore, we consider a restriction of exponential mapping for unit time and reduced the optimal control problem to systems of algebraic equations in Jacobis functions. With the combination of standard methods of solving algebraic equations, the knowledge of the topological complexity of the configuration space of the planar elastica and the aid of computer vision techniques, we found optimal minimal energy configurations along the path to a specified final configuration of the planar elastica. The planner was tested in simulation to achieve various configurations of minimal energy and the regions where instability and self-intersection of the elastica occur are noted. This work has applications in optimal control of flexible (space) manipulators, manipulation of a piece of paper, cable routing in vehicles, humanoid robots, pharmaceutical drug design, medical, and surgical procedures

PC.22. The effects of parental distress on young adult CNS cancer survivors' employment and community integration

Nancy Intapura, Junior, Psychology, LAS

Jenna Reid, Senior, Psychology, LAS

Elizabeth Howard, Junior, Community Health, AHS

Mentor: David Strauser, Kinesiology and Community Health, AHS

ABSTRACT

Employment and community integration are central to individuals' well-being. Research has found that the lack of employment and community integration are problem areas for young adult CNS cancer survivors. Focus groups with parents and young adult survivors has suggested that there is a discrepancy between parent and child perceptions regarding employment potential and

community integration which contribute to poor employment and community integration outcomes for young adult CNS survivors. In this study we will look at the discrepancy between young adults and their parents' perceptions of their young adults' employment potential and level of community integration. Furthermore, we examined the relationship between the level of parental distress and parent perceptions regarding their young adults' employment potential and community integration. With minimal research in this area the results of this study are important because it is the first study that examines parental distress and its relationship to employment and community integration. Implications and directions for future research will be discussed.

PC.23. Self-healing silver particle circuits

Sarut Chayanupatkul, Junior, Materials Science and Engineering, ENG

Mentor: Susan Odom, Chemistry, LAS

ABSTRACT

Developing a circuit that can autonomously restore its electrical conductivity when it is damaged is perhaps an utmost importance when human intervention is not possible for maintaining the damaged circuit. Our research group seeks to develop a self-healing circuit that does not only have the ability to instantaneously restore its conductivity, but also the ability to perform the healing process consistently, prevent short-circuiting, and definitely do not provide harmful effects towards the users and the environment. Thus, we developed a self-healing circuit that incorporates the use of conductive silver ink and non-toxic organic solvent-filled microcapsules. The main reason for selecting silver ink to be used in the circuit is that silver ink can be easily printed and shaped into any designs with high precision and relative ease. The healing mechanism involve in the process is based upon the fact that particular solvents have the ability to dissolve the polymer binder in the silver ink. During a mechanical damage to the circuit, the microcapsules will burst out the solvent, which dissolves the binder and redistributes the silver particles along the crack; hence, establishing a reconnection of the silver ink. In the investigation, scratch testing was performed on each sample to imitate scratch damages that may occur in actual situations. As a result, all of the damaged circuits were able to restore their conductivity to relatively close to their initial values within a period of 3 minutes. From the results of our research, we strongly believe that even though the development of self-healing circuit is still in its infancy stage, but with further research and investigations, self-healing circuit can be infused into many electronic applications and definitely played a significant role in the development of future innovations.

PC.24. Changing the channels: Understanding U.S. democracy promotion assistance

Michelle Eack, Senior, Political Science and Psychology, LAS

Mentors: Jose Antonio Cheibub, Political Science, LAS; Paul Diehl, Political Science, LAS; Matthew Winters, Political Science, LAS

ABSTRACT

The U.S. spends over \$1 billion a year supporting democratic initiatives throughout the world. From helping write constitutions, to moderating elections and funding independent media organizations, democracy promotion has become a major item in the foreign affairs budget and is integrated into nearly all U.S. missions abroad. Although foreign aid has been studied extensively, few have looked at the channels through which the U.S. funnels its democracy assistance. The U.S. can choose to funnel democracy promotion aid to one of two aid channels. In one channel, aid goes directly to the recipient government for democracy promotion programs. If aid is given through the non-governmental (NGO) channel, the U.S. trusts NGOs to disperse the aid appropriately. How does the U.S. decide which channel to use to promote democracy abroad? What factors go into this choice? I seek to fill this gap by examining if political factors play a role in how the U.S. allocates democracy promotion aid. With this knowledge we can better understand how the US supports this major element of American foreign policy in the post-Cold War era. To make critical policy decisions, the U.S. must understand how the channels it uses affects the democratization process within recipient states. A responsible global power understands the effects their actions have on other states and ensures the results are in accordance with national interests. I will examine how the U.S. allocated bilateral aid to aid recipients in all regions of the world between 2006 and 2009 by focusing on three major components: the current level of democracy of the recipient state, the level of corruption, and the agreement with U.S. policies to examine how the U.S. supports democratic promotion programs differently across various conditions.

PC.25. Public transportation costs and future cities

Emily Blumenthal, Sophomore, DGS

Mentor: T. John Kim, Urban and Regional Planning, FAA

ABSTRACT

Transportation plays a crucial role in connecting cities and regions. It is a vehicle for the promotion of development and integration of markets and societies. As such, the current financial woes of the nation's transit systems have the potential to cripple our society. There is a problematic discrepancy between these systems operating expenses, which are significantly increasing over time, and their incoming revenue, which has remained relatively static across the same time frame. This paper will analyze operating expense data and revenue data, as well as the potential implications of the data findings, and technological solutions, such as environmentally efficient technologies and geographic information system (GIS), to the issues unveiled. Daniel Burnham, one of the greatest minds in urban planning, once called upon his fellow citizens to "Make

no little plans aim high . . . think big.” It is imperative that these words resonate as we address the financial woes of transit systems. Short-term solutions will not thoroughly address the ever-widening gap between transit systems operating expenses and revenues. This discrepancy burdens the systems, the riders and governmental budgets and programs. It is a large issue, and thus must be approached with a focus on large-scale solutions: as Burnham said, we must think big. Implementation of energy efficient technologies and practices as well as geographic information systems has the potential to have the dramatic impact necessary to truly allow for more sustainable transit systems and the cities and regions they serve.

PC.26. Chronic d-amphetamine administration increases hippocampal neurogenesis in C57Bl/6J mice

Emily Christine Dabe, Senior, Psychology and English, LAS

Mentor: Justin Rhodes, Psychology, LAS

ABSTRACT

Adderall is currently the most prescribed drug for the treatment of ADHD in the United States. However, the long-term health effects of d-amphetamine (the main component of Adderall) are not known. Administration of methylphenidate (Ritalin) to juvenile rats caused a decrease in adult hippocampal neurogenesis and decreased locomotor responses in novel environments, which both are symptoms correlated with depression. The purpose of this study was to examine the long-term consequences of clinically proscribed doses of d-amphetamine administered from juvenile through adulthood on locomotor activity and survival of new cells in the hippocampus. Beginning in early adolescence (age 28 days) through adulthood (age 71 days) mice were administered twice daily intraperitoneal (ip) injections of vehicle, 0.25, 0.5 or 2 mg/kg d-amphetamine. Mice were monitored via video tracking for changes in locomotor activity for three-day intervals on days 12-14 and 67-69. On days 25-27 animals were given daily ip injections of BrdU to label dividing cells. On day 44, (age 71 days) animals were euthanized and brains were sectioned and immunohistochemically stained to detect BrdU in the dentate gyrus of the hippocampus. Long-term administration of d-amphetamine resulted in a dose-dependent increase in number of BrdU positive cells. Only the highest dose of d-amphetamine caused a detectable increase in locomotor activity and sensitization upon repeated trials. Results suggest that both therapeutic and abuse doses of d-amphetamine increase number of new cells in the hippocampus when administered from juvenile through adulthood. Future analysis will determine the proportion of new cells that differentiated into neurons versus astrocytes. Results suggest part of the beneficial effects of therapeutic doses of d-amphetamine for ADHD could be via increased hippocampal neurogenesis.

PC.27. Do you hear it? Using illusory sounds to differentiate hearing impaired, tinnitus, and normal hearing adults

Kristina N. Rutas, Senior, Speech and Hearing Science, AHS

Corinne Heller, Junior, Speech and Hearing Science, AHS

Jenise Chappell, B.S., Speech and Hearing Science, AHS

Mentor: Fatima Husain, Speech and Hearing Science, AHS

ABSTRACT

Tinnitus is the condition of sound perception in the absence of external stimuli. Tinnitus perception has been described as ringing, buzzing, roaring, chirping, or the sound of steam escaping (Noell and Meyerhoff, 2003). About 50 million Americans experience tinnitus. Of the 50 million, 16 million seek medical attention and 2 million Americans experience severe debilitation (ata.org, 2010). Zwicker tone is an auditory illusion, whose perception can be elicited through presenting notched broadband sound. The tone occurs after the stimuli has ended and decays within a few seconds. Norena et al. (2000) investigated neural lateral inhibition as an underlying process for Zwicker tone and tinnitus perception. They posited cochlear damage and peripheral changes as leading to tinnitus development. Parra and Pearlmutter (2007) created a conceptual model to predict Zwicker tone and tinnitus phenomena. The authors linked Zwicker tone perception and tinnitus, and related tinnitus to hearing loss through loss of nonlinear auditory compression caused by hearing loss. The present study investigated links between Zwicker tone perception and tinnitus with the goal of understanding the underlying mechanisms of tinnitus. Our hypothesis was that adults with tinnitus would perceive the Zwicker tone more frequently due to similar underlying mechanisms. We examined Zwicker tone perception in older adults with tinnitus and hearing loss, those with hearing loss without tinnitus and a control group with normal hearing without tinnitus. Our results showed that adults with hearing loss without tinnitus perceive the Zwicker tone more frequently than the other two groups. This suggests that the underlying mechanism for Zwicker tone perception may differ from those of tinnitus perception. Together with the results of other studies conducted by the Auditory Cognitive Neuroscience Lab, these results imply a more central mechanism for tinnitus rather than a peripheral one.

PC.28. A house divided: The effects of contested primaries on the ensuing general elections for U.S. house members

Andrew P. Maloney, Senior, Political Science, LAS

Mentor: Brian Gaines, Political Science, LAS

ABSTRACT

Conventional wisdom says that candidates who run in a contested primary election are disadvantaged during November general elections. But research on the so-called divisive primary hypothesis has yielded mixed results at best. In this study, I will address the literature and revisit questions on primary elections and their effects on ensuing general election outcomes. My primary focus is on both Democrats and Republicans running for the U.S. House of Representatives during the 2010 elections. Determining the extent to which these candidates are helped, hurt or unhindered by primary challenges will not only help us resolve the divisive primary puzzle, but also help us conclude whether party leaders and candidates act rationally when it comes to deterring electoral competition.

PC.29. Objective behavioral correlates of hearing loss and tinnitus

Stephanie D. Willard, Senior, Speech and Hearing Science, AHS

Mentor: Fatima Husain, Speech and Hearing Science, AHS

ABSTRACT

As the baby boomers age, research looking into many diseases and disorders prevalent in aging people has become a major interest. It is estimated that in the United States 1 in 3 adults over the age of 60 has some degree of hearing loss and by age 80 that number increases in 1 in 2. 40% of those with hearing loss also have tinnitus or "ringing in the ears." According to the Americans Tinnitus Association, 50 million Americans experience tinnitus with 16 million of them seeking medical help. The Audiology Neuroscience Cognitive lab aims to provide a detailed behavioral assessment of three test groups of older adults: normal hearing, hearing loss, and tinnitus. These assessments will help to describe each group and distinguish between the groups using objective measures. The tests include pure-tone threshold tests, speech and word recognition tests, distortion products otoacoustic emissions (DPOAEs), tinnitus loudness matching, and tinnitus pitch matching tests. We tested 43 subjects: 16 reported tinnitus, 15 had hearing loss, and 12 had normal hearing. In the tinnitus group the average age was 50, pure threshold average (PTA) for both ears was 22 dB, and the group was equally distributed between men and women. In the hearing loss group the average age was 56, the PTA was 23 dB in the left ear and 19 in the right ear, and was made up of 9 men and 6 women. In the normal hearing the average age was 52, the average PTA in both ears was 12 dB, and was made up of 5 men and 7 women. We found that DPOAES for the hearing loss group differed from those with tinnitus. We also found that pitch matching of the tinnitus percept was not as reliable a measure as that of loudness matching.

PC.30. Achievement, student demographics, and teacher certification in Illinois charter schools

Kathleen E. Kreisel, Sophomore, Pre-Education, EDU

Katrina Nelson, Sophomore, Pre-Education, EDU

Mentor: Sheila Dean, Curriculum and Instruction, EDU

ABSTRACT

Charter public schools have received a great deal of attention recently in the United States. A charter public school is a non-religious public school operating under a contract or charter that governs its operation. Charter schools have evolved over about two decades as a way to experiment with education innovations and provide public school choice. Charter schools are similar to public schools in that they are publicly funded; they may differ from public schools in their organization, curriculum and instruction, support programs, etc. There are currently thirty nine charter schools in Illinois serving over 35,000 students. In Illinois, all charter schools are authorized by the local school district but management of charter schools is provided by a variety of entities. This study addresses the question: How do achievement, student demographics, and teacher certification in Illinois charter schools compare for schools managed by for-profit EMOs (Education Management Organizations) vs. schools managed by non-profit EMOs vs. schools managed by a post-secondary institution vs. schools managed by some other entity? The methodology for this study involves using publicly available Illinois State Board of Education databases to retrieve achievement data for the past 4 years for all Illinois charter schools as well as data re student demographics and teacher certification. This study will provide valuable information related to the relative success of different ways of managing a charter school.

PC.31. Change detection: The identity of faces with happy and fearful emotions

Natalie Henry, Senior, Psychology, LAS

Mentor: Daniel Simons, Psychology, LAS

ABSTRACT

Perceiving faces and emotions is essential to navigating social interactions. Previous studies have suggested that faces and emotional expressions naturally draw attention, yet research regarding the influence of specific emotions such as fear and happiness on visual attention is unclear. The goal of this study was to examine what factors influence visual perception; specifically, how fearful and happy emotions affect the accuracy of detecting a change in the identity of a face, especially because threatening faces have been shown to naturally draw attention. Participants (N = 16) completed 216 trials in a one-shot change detection task. On each trial, participants viewed the faces of four individuals displaying either fearful or happy expressions on a computer. Next, a blank screen flashed quickly to mask motion cues, followed by another screen containing three of the original faces and one new face. Participants were then asked to make a forced choice as to which face changed identity. Finally, the Big Five Personality Questionnaire was administered as an exploratory component.

We predicted that the accuracy of change detection would be lower for fearful faces than for happy faces. However, preliminary data suggest that there is no difference in the accuracy rate between these two conditions. The exploratory Big Five Personality Questionnaire may provide some interesting relationships with accuracy, but more participants are needed. Preliminary analyses for personality traits indicated a negative correlation between accuracy in fearful faces and conscientiousness. These data may provide a clearer understanding of how emotions such as fear and happiness influence our perception of faces.

PC.32. Heat transfer in TEMHD-driven liquid lithium flow

Travis Mui, Sophomore, Nuclear, Plasma, and Radiological Engineering, ENG
Ryan Switts, Junior, Nuclear, Plasma, and Radiological Engineering, ENG
Mentor: Wenyu Xu, Nuclear, Plasma, and Radiological Engineering, ENG

ABSTRACT

A pressing issue today in fusion research is the need for a material able to operate under high a heat and magnetic flux in fusion machines. Currently, a majority of fusion machines operate with solid plasma facing component (PFC) materials, such as tungsten or graphite. However, as fusion research presses onwards and the plasma and power density climbs higher, higher thermal stresses are put on the PFC materials. This project investigates the premise of using liquid lithium as a PFC material in the inner surface and diverter region of tokamak fusion reactors. The Solid/Liquid Lithium Diverter Experiment (SLiDE) was built at the University of Illinois, Center for Plasma-Material Interactions to study the effects of fusion-relevant conditions on lithium. Recent results revealed that thermoelectric magnetohydrodynamic (TEMHD) driven flows are dominant in liquid lithium under these conditions. It is hoped that these convection flows can be utilized to effectively transfer heat from a hot to cold region. Thermocouple measurements in the holding apparatus and lithium flow, along with surface temperature measurements via an IR camera system are used to generate a 3D convection flow model used to understand the experimental results.

PC.33. Gendered violence on the U.S.-Mexico border: Femicide in Ciudad Juárez

Victoria F. Briones, Junior, Psychology and Latina/o Studies, LAS
Mentor: Gilberto Rosas, Anthropology, Center for Latin American and Caribbean Studies, and Latina/Latino Studies, LAS

ABSTRACT

This research project investigates the mass murders of women in Juárez, Chihuahua, on the U.S.-Mexico border. More specifically, I focus on the factors that contribute to the murders, such as circumstances women are forced to live in. Because of the lack of scholarship on and media attention to this topic, many people are not thoroughly informed about this issue. Using qualitative

research methods such as social analysis and using mainly secondary sources this approach will provide a better understanding of the underlying reasons the violence began and continues to occur.

PD SESSION, 3:15-4:30 p.m. (PINE LOUNGE)

PD.01. New yeast strain development using UV mutagenesis for cellulosic ethanol production

Jenny Yang, Junior, Human Nutrition, ACES
Mentor: Yong-Su Jin, Food Science and Human Nutrition, ACES

ABSTRACT

By using UV mutagenesis, I would like to develop new yeast strains with desired phenotypes in order to produce ethanol from lignocellulosic biomass such as wood and agricultural residues. Ethanol produced from the lignocellulosic biomass by ethanologenic yeast *Saccharomyces cerevisiae* will be highly cost-effective, energy-saving, and eco-friendly biofuel that can replace petroleum. However, native *S. cerevisiae* strains cannot efficiently ferment various sugars such as xylose and cellobiose derived from the biomass hydrolyzates. Although heterologous genes that are required for utilizing xylose and cellobiose were introduced to the native strains, the engineered strains showed limited fermentation capability of both sugars. We hypothesized that there were unknown genetic factors that limit or inhibit ethanol production of the engineered strains. UV mutagenesis is one of metabolic engineering techniques that can easily create a broad range of genetic perturbation in yeast strains in a short period of time. With high throughput screening methods, I will generate a large pool of UV-mutagenized strains and isolate new strains that have high xylose and cellobiose consumption rates and high ethanol yields and productivities.

PD.02. Parents' Recording of Children's BMI: Fact or Fiction?

Jennifer Rogers, Senior, Community Health-Administration and Planning, AHS
Justine Lee, Junior, Community Health-Health Education and Promotion, AHS

ABSTRACT

As part of the STRONG Kids research program, data was collected between Spring 2009 and Summer 2010 for 337 preschoolers in a three-county Midwest geographic area. Each child's body mass index (BMI) was then calculated by using a stadiometer and digital electric scale in order to take height and weight calculations. Because researchers suggest that the first step in the treatment of overweight is to help families recognize their child's overweight status, it is

important to know whether or not a child really is at risk of being obese (Eckstein, Mikhail, Adolfo, Thomson, Millard, and Binns, 2006, p. 682). The purpose of our study is to determine whether or not parents can accurately determine their kids' BMI, compared to the actual data collected. Previous research has shown that several factors including parents' weight status, education level, and the age of the child play a role in their ability to see their offspring as having a normal weight or not.

PD.03. (Are) you coming? Parent question types to their children in the earliest stages of grammatical development

Elizabeth Marie Eichorst, Senior, Speech and Hearing Science, AHS

Mentor: Pamela Hadley, Speech and Hearing Science, AHS

ABSTRACT

In previous studies, parents' use of yes/no questions has been shown to facilitate children's grammatical development. However, parents' language input and its relationship to children's grammatical development is not well understood. By describing properties of parents' grammatical input, it may be possible to understand what type of data is most facilitative. Differences in parents' questions may be related to a tendency to use a more formal register (e.g., are you coming?) or a more casual, reduced style of speaking to their young children (e.g., you coming?). Importantly, this reduced style is still grammatical, but may not be as beneficial for children's acquisition of grammar. The purpose of this study was to describe the different types of questions that parents ask their children at 21-months of age. Twenty parents and their children participated in free play interactions. Language samples were collected, transcribed, and coded using the Systematical Analysis of Language Transcripts software (SALT; Miller and Chapman, 2000). A question coding system was developed to identify all parent questions that contained a verb in the language samples. Verb forms were also coded to describe if overt or ambiguous evidence for tense was provided in the questions. By using these two coding systems in combination, the grammatical properties of parent questions could be described. Results showed that 99% of the parent questions were grammatical. 27% of the questions were yes/no with subject-auxiliary inversion and 12% were yes/no with omissions. Differences in the rate of omission will be examined as a function of grammatical subject type. The discussion will focus on the potential effect of parents' use of the more formal register and the reduced question style for children's grammatical development.

PD.04. Parent-examiner differences in their use of toy talk and its relationship to input informativeness

Brittany A. Jansen, Senior, Speech and Hearing Science, AHS

Mentor: Pamela Hadley, Speech and Hearing Science, AHS

ABSTRACT

Understanding the contribution of language input to children's grammatical development is critical to the development of the most effective language intervention programs. In a recent study, Hadley, Rispoli, Fitzgerald and Bahnsen (in press) demonstrated that parents' input informativeness for tense, operationalized as the proportion of verb forms marked unambiguously for tense out of all verb forms, was related to children's more rapid grammatical growth. In two follow-up studies, Fitzgerald (2010) found that the proportion of parent sentences that described the states, actions or properties of third-person subjects was positively associated with input informativeness, and Walsh (2010) found that adults could be taught to increase their use of these types of sentences. Importantly, significant increases in input informativeness accompanied the increase in sentences with third-person sentences. The current study compares parents' use of sentences with third-person subjects to trained examiners to use of toy talk, a discourse style that emphasizes use of third-person lexical nouns as sentence subjects. It is hypothesized that the trained examiners will use more toy talk than the untrained parents, and this will also lead to increased levels of input informativeness. Language samples were gathered from 12 parents interacting with their 21-month-old toddlers and from 3 examiners interacting with the same toddlers. Adult utterances were then coded for use of toy talk, defined as utterances, which contained an explicitly stated subject, verb, and third-person subject. Results showed that trained examiners used more toy talk than untrained parents. The relationship between use of toy talk and input informativeness will be discussed, as well as the implications of introducing caregivers to toy talk as a simple strategy for enriching the grammatical input provided to children.

PD.05. The *Sentence Diversity Checklist*: Characterizing early syntactic development using parent report

Megan Marie McKenna, Senior, Speech and Hearing Science, AHS

Mentor: Pamela Hadley, Speech and Hearing Science, AHS

ABSTRACT

Most children acquire language without difficulty, progressing rapidly from single-word utterances (e.g., nose; sleep), to simple child-like sentences (e.g., nose go there; baby sleep), and then to longer, multi-word sentences marked for tense and agreement (e.g., the nose goes in there; the baby is sleeping). Existing parent report tools provide a valid means of assessing children's vocabulary development and the emergence of more grammatically-complex forms (Fenson et al., 2007). However, current measures used to assess the onset of first sentences focus primarily on the average utterance length. For this study, we developed a parent report tool to measure children's sentence diversity. Sentence diversity, or the ability to combine different sentence subjects and verbs, is hypothesized to be a more sensitive indicator of progress

in early grammatical development than changes in average utterance length alone. Specifically, sentence diversity is hypothesized to be a precursor to the subsequent development of tense and agreement (Hadley and Rispoli, 2010; Villa, 2010). The purpose of this project was to develop a parent report tool, the *Sentence Diversity Checklist (SDC)*, to measure children's early sentence diversity, and to evaluate its validity. Parents of 10 toddlers completed the *SDC*. Toddlers were between the ages of 21 and 27 months and were producing 100 to 400 words. The toddlers also participated in a one-hour free play session to obtain sentence measures from spontaneous language samples. A moderately strong correlation was observed for the number of unique subject-verb combinations reported on the *SDC* and from the language samples. In addition, patterns of sentence subject expansion were similar to those reported by Villa (2010). The discussion will address the value of using parent report as part of the assessment process and the use of the *SDC* as a predictor of children's subsequent progress in grammatical development.

PD.06. The effects of aerobic exercise training on inflammation-associated depression

Stephanie Johnson, Junior, Kinesiology, AHS

Mentor: Steven Martin, Kinesiology and Community Health, AHS

ABSTRACT

Aging is associated with brain inflammation, which may play a causal role in the higher prevalence of depression and fatigue observed in older adults. Indeed, >20% of adults over the age of 65 suffer from episodes of depression serious enough to warrant diagnosis and treatment. The cause of brain inflammation during aging is complex and not fully understood, but recent data from our lab suggest age-induced inflamed visceral adipose tissue may propagate an exaggerated inflammatory signal to the brain, promoting chronic brain inflammation. Due to this adipose-brain communication, therapies directed at attenuating visceral adipose tissue inflammation are viable and attractive options to reduce the risk of depression and fatigue observed in aged persons. Regular cardiovascular exercise represents one such therapy, as it has been shown to reduce adipose tissue inflammation in animal models of obesity. No studies, however, have examined if/how regular exercise training reduces aged adipose tissue inflammation, and whether this change is related to the systemic and brain inflammation in aged mice. Therefore, the central focus of our research is directed toward answering the following question: Does aerobic exercise training reduce visceral adipose tissue inflammation in aged mice, and does this correlate with a reduction in systemic and brain inflammation? **Methods:** 23 month-old male C57BL/6J mice will be randomized to either voluntary wheel training or locked wheel for a duration of 12 weeks. Following training, inflammation will be induced by intraperitoneal injection of Lipopolysaccharide (0.33 mg/kg) or

saline. Twenty-four hours post-injection, mice will be euthanized and tissue will be collected for inflammatory analysis. Adipose, brain, and systemic markers of inflammation will be analyzed via qRT-PCR, Immunoblot, and ELISA.

PD.07. Investigating the mechanism of DNA damage induction by three haloacetic acid drinking water disinfection by-products

Justin Kyan Ang, Senior, Animal Sciences, ACES

Mentor: Justin Pals, Crop Sciences, ACES

ABSTRACT

Drinking water disinfection byproducts (DBPs) are generated during the chemical disinfection of water. Haloacetic acids (HAAs) are the second most common DBP in chlorinated water. Previous studies have shown that HAAs are cytotoxic and genotoxic. These studies showed that iodoacetic acid (IAA) was the most toxic of the HAAs followed by bromoacetic acid (BAA) and chloroacetic acid (CAA) was the least toxic. Little is known about the mechanism by which these DBPs induce DNA damage or genotoxic effects. In this study, acellular Chinese hamster ovary (CHO) nuclei were exposed to the monoHAAs and DNA damage was measured using the Comet Assay. Contrary to what was shown in whole cells, HAAs did not induce DNA damage to acellular nuclei. This data suggests that the monoHAAs are not directly interacting with CHO nuclei and that the HAAs require a cellular process to induce DNA damage. It has been reported that IAA is an inhibitor of the glyceraldehyde-3-phosphate dehydrogenase enzyme (G3PDH). We measured the effect of IAA, BAA, and CAA on the activity of G3PDH through enzyme inhibition assays. The rank order of inhibition by the three HAAs followed the rank order of cytotoxicity and genotoxicity wherein IAA>BAA>>CAA in inhibition activity. Furthermore, we have shown that co-incubation of HAAs with butylated hydroxyanisole (BHA), a radical scavenger, can reduce DNA damage in CHO cells. These data suggests that HAAs are not directly acting on DNA and that some cellular process is needed to induce DNA damage. We predict that the inhibition of G3PDH by HAAs triggers the release of reactive oxygen species, which then go on to damage DNA.

PD.08. Characteristics of university-affiliated charter schools

Monika K. Patel, Sophomore, Elementary Education, EDU

Mentor: Sheila Dean, Curriculum and Instruction, EDU

ABSTRACT

Charter public schools have received a great deal of attention recently in the United States. A charter public school is a non-religious public school operating under a contract or charter that governs its operation. Charter schools have evolved over the past two decades as a way to experiment with innovative

education and provide public school choice. Charter schools are similar to public schools in that they are publicly funded; however, they may differ from public schools in their organization, curriculum and instruction, or support programs. There are currently 39 states with charter school laws, with a total enrollment of about one and a half million students. The current U.S. Department of Education is promoting charter schools as a major route to school improvement. In some states, universities/colleges can function as charter school authorizers, but in Illinois only school districts can serve this function. There are, however, universities in Illinois that have some kind of affiliation with charter schools. In my study I address the questions: What is the nature of the university/college affiliations of several charter schools in Illinois? How, if at all, do these affiliations benefit either the university/college and/or the charter school? The methodology used for this study is the development of in-depth case studies of four Illinois university/charter school affiliations, using data from the university and charter school websites and other publicly available data sets, as well as interviews with representatives from each university. This study has implications for other universities, including Illinois or elsewhere that may be considering an affiliation of some kind with a charter public school.

PD.09. If you play, I play (and other little truths of parent-child activity)

Dorian Laura Gittleman, Senior, Psychology, LAS

Mentor: Amber Hammons, Family Resiliency Center

ABSTRACT

Physical activity is crucial in preventing overweight in preschoolers, and as they grow, it is a huge contributor to their overall health. As of 2006, obesity in ages 2 to 5 was 12.4% (Loprinzi and Trost, 2009). It is imperative that we take further steps in addressing how to stop children growing more around the middle than from top to bottom. Studies by Alderman, Bentham-Deal and Jenkins (2010) and Moore et al. (1991) demonstrated that children's level of physical activity is significantly correlated with parents' physical activity. However, the subject pool of those studies was small and addressed older preschoolers, leaving out 2 and 3 year olds. The results of this poster come from data collected by the STRONG Kids program, using the Spark Parents Survey (2004), and reflect the physical activity habits of 427 families in a Midwestern tri-county area. These families were recruited from local preschools and daycares registered with the State Bureau of Child Care and Development. The survey results confirm findings by prior researchers of a significant relationship between parent and child activity, even in children as young as 2. A particularly important finding from the survey was a strong correlation between parents actively playing with their child, and the child's reported physical activity. Further longitudinal studies should be conducted tracking the activity of a child over their full development, to determine if these children of active parents continue to be active, even as their parents' influence on their activity declines.

PD.10. Stress, distress tolerance, and impulsive behaviors

Alex Lane, Senior, Psychology, LAS

ABSTRACT

Distress tolerance and impulsivity have been associated with externalizing outcomes like aggression, illegal substance use, and smoking. However, few studies have measured both constructs simultaneously. Understanding the relation between distress tolerance and impulsivity can provide information on the etiology of externalizing outcomes as well as the most appropriate and effective forms of treatment. The present study had two goals. First, the study intended to establish stress as a moderator between low distress tolerance and high levels of impulsive behavior. A total of 65 adolescent participants were divided into a stress group and a no-stress group. Both groups completed a self-report measure of distress tolerance. Then only the stress group experienced a laboratory stressor, and both groups completed a laboratory task to measure impulsivity. Evidence showed that individuals with low distress tolerance in stress conditions displayed significantly higher levels of impulsive behaviors on the laboratory task when compared to all other groups ($p < .05$). Study 2 investigated whether high levels of impulsivity would serve as a mediator in the relationship between low levels of distress tolerance and high levels of risky externalizing behaviors (i.e. smoking, illegal substance use, and aggression.) Participants completed self-report measures for distress tolerance and impulsivity, and levels of risky externalizing behaviors were reported by participants' parents. Using hierarchical multiple regression, low levels of distress tolerance successfully predicted risky externalizing behaviors only when impulsivity was introduced as a mediator. These results have important implications for understanding how stress, distress tolerance, and impulsivity can all interact to produce negative outcomes in adolescents. Additionally, results from this study underlie the importance of stress coping and distress tolerance training in both treatment and prevention of the externalizing risky behaviors, especially in adolescents.

PD.11. Fast food choices: Using the core meal to select healthier options in today's fast food environment

Wenbo Jia, Junior, Chemical Engineering, LAS

Mentor: Nathan S. Pratt, Food Science and Human Nutrition, ACES

ABSTRACT

The modern fast food environment favors convenience over health, often sacrificing nutrition in order to deliver foods faster and in larger quantities. Consumers have less time to evaluate the quality of their food choices and are consequently unaware of the amount of energy they are consuming, resulting in increased obesity. This study demonstrates the use of the Core Meal, a model of communicating nutritional information, on a selection of food menus from a

number of fast food restaurants (Taco Bell, Burger King, Panera, Subway). This model focuses on fiber and protein for weight management since they increase satiety. Menus and nutritional data were collected using online sources from the official websites of each establishment to obtain the most recent data available. Food items were categorized using a scale of grams fiber and protein per 100 kcal. Using these derived ratings, the data was used to generate a plot of nutritional density, thus quantifying the nutrients of each food item on a menu. It was found that in a sample of over 200 items, only 41% fit into the core meal, showing that most food items were too high in fat and caloric content. Of the items that fell within Core Meal requirements, it was found that chicken and beans were preferred sources of protein and fiber, respectively. Trends also showed that fried potatoes and cream based soups were not a reliable source of fiber or protein, corresponding to a high energy density. It follows that foods which fit into the Core Meal criteria are preferable for weight management, since more protein and fewer saturated fats are used as an energy source. This plot serves to guide one's diet by illustrating food options to help regulate intake of fiber, protein and/or saturated fat.

PD.12. Conversational repetition and aphasia: A case study

Kyle P. Easter, Senior, Speech and Hearing Science, AHS

Mentor: Julie Hengst, Speech and Hearing Science, AHS

ABSTRACT

Aphasia is an acquired communication disorder affecting one million Americans (National Institutes of Health, 2010). Caused by brain damage from stroke or other injuries, aphasia disrupts individuals' understanding and use of language. Speech-language pathologists provide therapy for clients with aphasia designed to improve language use and functional communication. A fundamental principle and assumed therapeutic mechanism for therapy is repetition, and most therapy tasks involve clinicians structuring clients' repetitions of target items. This study is designed to examine the therapeutic value of conversational repetition for individuals with aphasia (Hengst, Duff, and Dettmer, 2010). Contrasting with clinician-directed tasks, this protocol supports conversational interaction around a set of targets using a game-like barrier task (Hengst et al., 2010). The task involves two participants (client with aphasia and clinician-partner) separated by a partial barrier. Players have identical boards with twelve spaces for twelve cards (representing places, concepts, or people). The director's cards are prearranged on his/her board before each game, and he/she describes to the matcher where to place each card. In this protocol, pairs play the game sixty times (six trials, 10 sessions) with one clinician-partner, and thirty times (six trials, 5 sessions) with a second clinician-partner. Data analysis (see Hengst, et al., 2010) includes: 1) assessment of collaborative referencing (accurate card placement, development of specific labels for each card, streamlining of labels across trials); 2) discourse analysis of patterns of conversational repetition of

labels for target cards during game play. "Butch," the client-participant for this study, is a 64 year-old woman with severe aphasia. Butch completed the full protocol with 99% correct card placement. Discourse analysis of specific labels used for cards and patterns of repetition is underway. The poster will present the protocol, analysis of collaborative referencing, and preliminary discourse analysis of repetition from sessions 1, 4, 7 and 10.

PD.13. The effects of early childhood feeding practices on oral health development in young children

Sonny Yuan Song, Junior, Psychology, LAS

Mentor: Juhee Kim, Kinesiology and Community Health, AHS

ABSTRACT

Previous studies suggested the association between early childhood feeding practices and oral health of young children. From this study, we have observed both positive and negative effects when it comes to oral health and breastfeeding. From the parent survey, we saw a correlation between drinking sweetened drinks daily and unhealthy oral hygiene habits. About 74% of the families do not use toothpaste containing fluoride. This can be a major detriment when it comes to oral cavity development. In addition to unhealthy oral hygiene habits, approximately 55% of the children go to bed with a bottle in their mouth every day. Ultimately, oral development later in life is directly dependent upon oral hygiene habits, namely whether or not the mother exclusively breastfeeds the child versus using formula, feeds the baby sweetened drinks, introduces solid foods, and uses fluoride toothpaste. Thus, evaluating these risk factors at an earlier age is important in dental caries prevention. Overall, there is a higher prevalence of unhealthy feeding practices that leads to negative oral hygiene practices in the future for young children.

PD.14. Backcrossing D6D gene into 129S6/SvEvTac strain strengthens conclusions of AA and DHA deficiency

Jannah Elizabeth LaHood, Senior, Molecular and Cellular Biology, LAS

Mentor: Tim Abbott, Food Science and Human Nutrition, ACES

ABSTRACT

Ulcerative dermatitis is a disease that can occur spontaneously or from excess scratching. It develops from skin irritation and hair loss that leads to colonization by opportunistic bacteria and ulcer development. This lab has established a line of C57BL/6J mice with a knockout allele for the delta-6-desaturase gene, using these mice to study the effects of arachidonic acid and DHA deficiency. This lab has previously shown that AA deficiency can cause dermatitis in C57 strain. Because C57 strain can develop dermatitis naturally, we decided that it would strengthen our conclusions if we use backcrossing to insert the ko allele

into the 129S6/SVEvTac strain of mice, a strain not naturally prone to develop dermatitis. The backcrossing is begun by pairing a pure 129 male with a C57 female heterozygous for the D6D gene. Next, the progeny are genotyped by clipping an ear sample, performing DNA extraction, PCR amplification of the DGD locus, gel electrophoresis, and examining the PCR products to determine the presence of ko and wt alleles for the D6D gene. A heterozygous male pup is bred with a pure 129 female, and the genotyping and pairing are continued for ten generations until the backcrossing is complete. During backcrossing, sixth-generation mice display the coat color characteristic of 129 strain, and dermatitis presents in some of the knockouts bred from the sixth generation. Observing dermatitis in kos of primarily 129 background helps strengthen our conclusion that AA and DHA deficiency increases frequency of dermatitis because there is consistency of this finding between the two strains. In future research projects, having two backgrounds in which to study D6D importance will help strengthen our findings.

PD.15. How marital status influences family mealtime frequency and household chaos

Stephanie Clara Hall, Senior, Food Science and Human Nutrition, ACES

Mentor: Amber Hammons, Human Development and Family Studies, ACES

ABSTRACT

This study aims to examine relationships between marital status, family mealtimes, and household chaos. The goal of this study was to explore whether married parents share a family meal with their children more often than single parents and if the family eating together more frequently reduces the perceived amount of household chaos. Research has shown that single parents are more likely to experience economic hardship and stressful events in their lives than those who are married (McLanahan and Booth, 1989). Households that are low-income experience a disproportionate share of chaos that is characterized by noise, crowding, lack of routine, and unpredictability. Low-income children tend to experience more chaos than more affluent children and display more socio-emotional distress (Evans et al., 2005). Data analysis was conducted using primary data with a sample size of 178 families from a larger evaluation of a weekend feeding program, the Backpack Program. In the larger study, marital status had seven levels, but for the purposes of this study, marital status was dichotomized to two levels (married and unmarried). Our data showed that families ate together about 5 times per week, regardless of marital status. Frequency of family mealtime was negatively correlated with some measures of household chaos (e.g. whether or not they agreed that they were usually able to stay on top of things), but positively correlated overall family chaos. Results from this study may suggest that family climate is significantly differs by family composition, specifically marital status.

PD.16. Assessing clinicians' fidelity in adolescent substance abuse treatment

Caitlin L. Regan, Junior, Social Work, SOCW

Natalie M. Cullen, Junior, Social Work, SOCW

Mentor: Douglas C. Smith, SOCW

ABSTRACT

Our research focuses on the Strengths-Oriented Family Therapy (SOFT) model, an efficacious treatment for adolescent substance abuse (Smith et al., 2006). The purpose of this study is to develop an adherence scale to evaluate the treatment fidelity of SOFT. Treatment fidelity refers to whether or not clinicians are delivering the intervention as intended. When treatment fidelity is documented in clinical trials, our inferences about whether the treatment caused clinical improvements are strengthened. We will review audio recordings of cases where the SOFT model was implemented, focusing primarily on the first session of treatment. To begin, we will listen to audio recordings as a group and develop an adherence-rating checklist to assess the effectiveness of the clinicians' delivery of the model. Each treatment activity will be assessed on a 1 to 5 Likert scale. We will then independently rate the tapes and compare our ratings to establish inter-rater reliability. The end product of this research is a rating scale measuring the core activities in SOFTs first session. Mean adherence ratings and inter-rater reliability estimates are presented and discussed in the context of the development of SOFT. The data we present will indicate key components of treatment fidelity that clinicians should follow to deliver the intervention effectively, and as intended. Furthermore, it will be useful for future training purposes.

PD.17. Education levels among food-insecure families

Christopher Bulaon, Junior, Agricultural and Consumer Economics, ACES

Mentor: Blake Jones, Family Resiliency Center

ABSTRACT

The objectives of this study are to evaluate indicators of food insecurity among families participating in the Backpack Program. The sample size included over 150 families throughout the Champaign-Urbana area responding to a questionnaire. Primary findings include statistically-significant correlations between education, income, and food insecurity. Respondents with college degrees or higher are more likely to have higher levels of income and are thus more likely to be food secure.

PD.18. An investigation of betaine-homocysteine methyltransferase and its mutants' activity level based on alterations at the potassium binding site

Katie L. Lowry, Senior, Food Science and Human Nutrition, ACES

Mentor: Timothy A. Garrow, Food Science and Human Nutrition, ACES

ABSTRACT

Betaine-homocysteine S-methyltransferase (BHMT) is an important enzyme in homocysteine (Hcy) metabolism. New crystal structures of the wild type enzyme revealed the presence of a potassium atom in the enzyme that appears to be critical for Hcy binding. Using site-directed mutagenesis, we changed the three amino acids within the conserved DGG motif that appear to participate in potassium binding as a way to probe their role in BHMT function. The mutant enzymes were purified, and the results show that the DGG motif is important for Hcy binding and catalysis. However, further work will be required to determine whether the loss of Hcy binding observed for the mutant enzymes is correlated to their ability to bind potassium.

PD.19. Correlation between fat and sodium content in commercially packaged foods

Daniel Joseph Krause, Junior, Food Industry and Business, ACES

Mentor: Soo-Yeun Lee, Food Science and Human Nutrition, ACES

ABSTRACT

Correlation between fat and sodium content in commercially packaged foods. Daniel Krause, Ginnefer Cox, and Soo-Yeun Lee.

Hypertension has been a growing problem for many individuals, many of whom are also overweight. Adhering to a low calorie diet is advised to many hypertension patients to reduce their continuing risk of hypertension. The main goal of this study was to find the correlation between fat content and sodium content in commercial food products. The goal was established based on the fact that a number of hypertension patients look to purchase low-fat and non-fat foods, although the sodium content could be significantly higher than their regular-fat counter-parts. The study was conducted at grocery stores all over Champaign County, including Schnucks, County Market, and Meijer. The food categories investigated were breads, cereals, and salad dressings. The nutrition facts of each food item were collected and analyzed. The nutrition facts that were of interest to the study included, serving size, number of servings, calories, fat, sodium, potassium, cholesterol, fiber, sugar, and protein. The data showed that with many food products, the low-fat or non-fat options did indeed have higher sodium content than the same food product by the same brand, but with regular fat content. The findings demonstrate that although many low-fat or non-fat foods could be adhering to a reduced calorie diet, and could lead to weight loss, there may be a detrimental aspect of this diet using commercial foods to a patient with hypertension, who is looking to reduce calories along with sodium level.

PD.20. Sleep deprivation and sugar consumption in Mexican young adults

Esther Adaeze Ikoro, Junior, Community Health, AHS

Mentor: Flavia Andrade, Kinesiology and Community Health, AHS

ABSTRACT

Chronic sleep deprivation and obesity are concerns that increasingly affect adolescents' health worldwide (Taheri, 2006). Although these two factors are seldom discussed in tandem, prior research has shown an inverse association between sleep time and body mass index (Landis, 2009). Furthermore, even a short period of sleep deprivation has been associated with an increase in hormones that regulate both meal-time hunger and long term regulations of body weight (Cummings, 2002). Since obesity is highly associated with sugar intake (Landis, 2009) it might also correlate with sleep deprivation. This study aims to describe the association between sleep deprivation and sugar consumption in Mexican young adults. We propose an exploratory study based on secondary data collected by the Up Amigos general survey during 2010. The study population will include subjects between 18 and 20 years. Data to be collected include demographics (age, gender), sleep deprivation (average weekly sleep time, sleeping problems), and sugar consumption (sweets eaten per week). Data analysis will be done using SPSS 19.0. We expect to obtain a positive correlation between the sleep deprivation and the sugar consumption.

PD.21. Childhood trauma, personality, and health: Does personality mediate the relationship between trauma and health?

Elizabeth Gonzales, Senior, Psychology, LAS

Mentor: Brent Roberts, Psychology, LAS

ABSTRACT

This paper examines personality as a mediator for understanding the link between childhood trauma and adult physical health. Data from a nationwide sample of adults (N=2136, M age=51 years) who completed measures of childhood trauma (physical and sexual abuse, family conflict, and traumatic events), personality, and health were used to examine the hypothesized model. Results show that several personality traits (conscientiousness, neuroticism, openness, and agreeableness) partially mediated the relationship between specific childhood trauma variables and physical health. The most striking effects were observed with the personality trait neuroticism. Every single traumatic experience variable predicted higher levels of neuroticism, which in turn resulted in poorer health. The significant mediation effect demonstrates that experiencing traumatic events, family conflict or abuse in childhood is capable of producing personality traits, which may be maladaptive for later adult health.

PD.22. The role of response selection and inhibition in an elicited-response false-belief task

Gina C. Petro, Senior, Psychology and Philosophy, LAS

Mentor: Renee Baillargeon, Psychology, LAS

ABSTRACT

Although children do not succeed at traditional false-belief tasks until age 4, they succeed at less challenging false-belief tasks much earlier. What makes traditional false-belief tasks so difficult? It has been argued that success at these tasks not only requires false-belief understanding, but also involves response-selection and inhibition processes; due to limited information-processing resources, the simultaneous activation of these various processes prevents young children from demonstrating their understanding. The present research examines whether children can succeed if these difficulties are reduced. In Experiment 1, 2.5-year-olds were tested in a low-demand traditional false-belief task. Children listened to a story, accompanied by pictures, in which Emma moved an apple from one container to another. In her absence, her brother took the apple away. Children were asked where Emma would look for her apple when she returned. Children who received response-selection practice answered correctly and children who received little or no response-selection practice responded randomly. In Experiment 2, which we have just started, 3-years-olds are tested in a high-demand traditional false-belief task that involves both response selection and inhibition: the object is moved from one container to another, in the character's absence, Children are given response-selection practice trials, and they are also asked a modified test question that does not require them to inhibit their own knowledge. Children's choices are coded, as well as their looking behavior towards each picture prior to the test questions. Preliminary data from 5 children look promising, with most children looking longer at the picture depicting the character, and also pointing correctly in answer to the test questions. Together, these data support the view that response-selection and inhibition difficulties contribute to young children's poor performance in traditional false-belief tasks, and show that children are more likely to succeed when these difficulties are reduced.

PD.23. Verb bias effects following sentential-clause biased verbs: A reading-time study

Pawel Laciak, Senior, Neuroscience and Psychology, LAS

Mentor: Susan Garnsey, Psychology, LAS

ABSTRACT

Verb bias is a measure of the frequency with which a verb is followed by a particular structure. Verbs that are more often followed by a direct object (DO) are considered direct object-biased verbs (DOV), while verbs more often followed by a sentential complement (SC) are designated sentential complement-biased verbs (SCV). A mismatch between bias and structure leads to increased reading times immediately after the verb, thereby impacting comprehension. This effect is termed the verb bias effect. Extensive evidence has shown a verb bias effect for DOV, while little research has been conducted to investigate SCV. Therefore, the present study aims to investigate SCVs. If verb bias is indeed an effect that generally impacts sentence comprehension, reading times should

be increased when SCVs are followed by a DO structure (DOS). The current experiment displayed sentences word-by-word on a computer monitor, while subjects read the sentences to themselves. 160 sentences were shown to each subject: 40 DOV-DOS, 40 DOV-DOS, 40 SCV-DOS, and 40 SCV-SC structure (SCS). For example, in the sentence "The referees warned the spectators about shouting," "the spectators" are the DO of warned and therefore they are the people being warned. However, in "The referees warned the spectators might shout," "spectators" is the subject of an embedded clause since someone who is not specified is warned about the spectators becoming loud. Because the verb warned is most often used in sentences such as the former, using it in a sentence like the latter should result in reliably longer reading times. Analysis of reading times found that for both SCV and DOV, subjects were reliably slower in reading the words that came after the mismatch between verb bias and sentence structure. These results suggest that the verb bias effect is a general phenomenon that occurs for other words besides DOV.

PD.24. Curriculum and instruction in Illinois charter schools

Erika Foster, Junior, Early Childhood Education, EDU

Jenny Alger, Junior, Elementary Education, EDU

Courtney Wills, Sophomore, Early Childhood Education, EDU

Mentor: Sheila Dean, Curriculum and Instruction, EDU

ABSTRACT

Charter public schools have received a great deal of attention recently in the United States. A charter public school is a non-religious public school operating under a contract or charter that governs its operation. Charter schools have evolved over about two decades (supposedly) as a way to experiment with education innovations and provide public school choice. Charter schools are similar to public schools in that they are publicly funded; they may differ from public schools in their organization, curriculum and instruction, support programs, etc. There are currently thirty nine states with charter school laws, with a total enrollment of about one and a half million students, and the current Department of Education is promoting charter schools as a major route to school improvement. A fair number of recent studies of charter schools compare their performance with the performance of students in traditional public schools. Typically, however, little attention is paid to the actual education programs offered in charter schools, even though the purpose of charter schools is to use their freedom from the traditional structure to create distinctive schools. This study addresses the question: How, if at all, do Illinois charter schools provide their students with customized educational experiences? The methodology used for this study is the retrieval from charter school websites of the following information: target population, curriculum, instructional approach, classroom structure, and student services for each individual charter school. This data is analyzed to determine the extent to which charter schools are actually

implementing innovative practices to meet the needs of their specific target populations. The research results about whether or not charters are innovative have implications for the rationale used to promote charter schools.

PD.25. Studio interact: Evaluation and proposal of architectural studio uses and needs at the University of Illinois at Urbana-Champaign

Jordan Billingsley, Senior, Architectural Studies, FAA

Kenneth Baumgartner, Senior, Architectural Studies, FAA

Mentors: Lee Waldrep, School of Architecture, FAA;

David Chasco, School of Architecture, FAA

ABSTRACT

The study evaluates the impact of a broad range of features of studio on the performance, stress, communication, learning, and development of students in the School of Architecture at the University of Illinois at Urbana-Champaign (UIUC). An investigation will be conducted as to how these studios are used, how each studio interacts, what design aspects are effective, what design aspects are ineffective, and what design aspects are lacking. Additionally, the study will include a comparison to studios at other universities. The study is a supplement to previous research conducted on architecture student studio spaces and studio culture at UIUC. Studio Culture is a term used to describe the experiences, habits, and patterns found within the architecture design studio. The architecture design studios at UIUC are located in three separate buildings: Temple Hoyne Buell Hall, the Architecture Building, and the Architecture Annex. A survey will be distributed to all current undergraduate and graduate architecture students at the UIUC via an online survey measuring the relationships between features of the studio space and students process for project development. Specifically, the survey measures the frequency architecture facilities are used, what tools are used in design development, and identifies attributes that students feel encourage or discourage interaction, efficiency, and production. To ensure that the questionnaire was constructed in a language that was familiar to participants, a validity survey was administered to a sample of students. Additionally, in order to gauge their opinions, critiques, and preferences of studio space design, interviews with design professors, students, and school of architecture administrators, will be conducted and recorded. The findings of this research will be used to create proposals for possible studio improvements in the School of Architecture. Proposals will be categorized and presented on three different scales: small, medium, and large.

PD.26. Design of photonic crystal slab hydrogen sensors

Jared Carter, Senior, Electrical Engineering, ENG

Mentor: Lynford Goddard, Electrical and Computer Engineering, ENG

ABSTRACT

Thin palladium films undergo a refractive index change under exposure to hydrogen gas in the atmosphere. This process is reversible and can be used for the detection of ambient hydrogen gas. Here we propose designs for optical hydrogen sensors utilizing photonic crystal slabs. Photonic crystal slabs are structures with two-dimensional periodicity, which can be used to confine light. Results from numerical simulations of these sensors will be presented.

PD.27. Breastfeeding practices among low-income women

Tiffany N. Freeman, Senior, Community Health, AHS

Krystal Wilson, Senior, Community Health, AHS

Monica Ahn, Senior, Food Nutrition and Science, ACES

Mentor: Juhee Kim, Kinesiology and Community Health, AHS

ABSTRACT

Breastfeeding practices amongst low income women. Tiffany Freeman, Krystal Wilson, Monica Ahn, Rose Ann Mathai, Jae Eun Shim, and Juhee Kim.

Breastfeeding is an essential feeding practice during the first six months of life that may help reduce the incidence of obesity. Our objective is to access the breastfeeding practices for infants 2-8 months and the reasons why breastfeeding was discontinued. Our study will be compares parent care (n=73) versus non-parent care users (n=35). Parent-infant dyads (n=108) were recruited from the Women, Infants and Children Office in Champaign, IL. Parents completed a self administered survey and the following questions were used: "Was your child ever breastfed?", "Are you currently breast feeding?", and "Is your child currently exclusively breast fed?" Approximately 71% of child care users had breastfed their child and 74% of parent care users had breastfed their child. However, mothers, who were currently breastfeeding at the time of the survey, had reduced to 42% for parent care and 38% for child care mothers with only 24% of parent care and 15% of child care exclusively breastfeeding. Mothers were also asked, "If your child is still being fed breast milk, how is the child fed while at the child care center?", "If your child is still being fed breast milk, how is the child fed while at home?", and "How old was your child when you stopped breast feeding?" About 94% of mothers were able to pump the child's breast milk was fed from a bottle while in childcare. Of the mothers who were breastfeeding at home 50% of child care users and 57% of parent care users were able to breast feed while at home. Also, a majority of parents had stopped breastfeeding less than one month and between the ages of 2-3 months. When asked why they stop breastfeeding mothers were asked why they stopped breastfeeding, 60% child care and 46.4% parent care mothers reported that they were worried that he/she was not getting enough. The next most common answer among 40% of childcare and 44.4% of parent care

mothers was he/she always seemed hungry. Thus, many WIC mothers are not following the recommendations for breastfeeding for the first 6 months. This is more evident among childcare users.

PD.28. Childhood obesity: Children's various food intake in relation to parents' level of education and nutritional knowledge

Lisa Ann Pearson, Senior, Community Health, AHS
Mentor: Amber Hammons, Family Resiliency Center

ABSTRACT

The STRONG Kids Research Project is a multidisciplinary study investigating several factors that contribute to childhood obesity and health. Participating children and families in central Illinois daycares are being studied, including 400 preschoolers and their families from 30 daycare centers over the course of 3 years. The STRONG Kids Research Projects Panel Survey includes questions concerning various aspects that could contribute to childhood obesity, from demographics and parents' opinions and knowledge to children's physical activity, food intake, and media influence. Specific questions from the survey data are analyzed to compare the amount of fresh fruits and vegetables as well as the amount of sweet and salty foods children actually eat to both the parents' level of education and the parents' nutritional knowledge. The Panel Survey was given to interested parents or guardians who have a child between the age of 3 and 5 years. The surveys were distributed through daycare centers and were to be completed either in paper form or online by the consenting parents. This research examines the data from the first wave of participants, cohort 1a and 1b, with a total of 400 completed surveys. The data collected was then compiled by trained research assistants to be analyzed and used for many sub-projects under the STRONG Kids Research Project. Other studies suggest that parents level of education and nutritional knowledge can affect a child's intake of fruits, vegetables, sweets, and salty foods, but analysis of the STRONG Kids data has yet to confirm this and is still being examined concerning this topic.

PD.29. Males and nursing

Melissa Kolod, Junior, Community Health, AHS
Mentor: Stephen Notaro, Kinesiology and Community Health, AHS

ABSTRACT

The topic that I have chosen for my research project is the relationship between gender and professions. Specifically, I will be focusing on the statistics of men in nursing and the stigma the profession carries. Even with the shortage of nurses, why is it that nursing remains to be primarily 90% women. In my research, I hope to answer what implications more male nurses would have on the profession as a whole and for the future of health care. Also, I will be looking at

the historical view of physicians and taking note of the implications women had on the profession for comparison. It is interesting to examine other professions as well and the percentage of women versus men working in certain areas. The sources I will be using will include scholarly articles and statistics from the National League for Nursing. My findings will be presented in a poster format with graphs and statistics as well as a summary of my findings. I look forward to presenting this idea because I do not believe it is a commonly discussed topic even though very fascinating. While health care is not everyone's interest, there may be a correlation between males and nursing and other professions that are gender dominant that will catch people's eye.

PD.30. An analysis of a multi-scale approach to associative memory

Felix Wang, Senior, Electrical Engineering, ENG
Mentor: Stephen Levinson, Electrical and Computer Engineering, ENG

ABSTRACT

In this work, I explore the behaviors and metrics relating to a nonlinear dynamical multi-scale model of associative memory developed by Alex Duda. The model utilizes an *ab initio* approach with the classic Hodgkin-Huxley neuron serving as the basis, and it aims to capture the functionality of associative memory as it works in humans. Particular to my analysis are the first two scales of the model, extending from the individual Hodgkin-Huxley neuron to a population of interconnected neurons. At the first scale, the neurocomputational behaviors exhibited intrinsic to the neuron model as well as those requiring modifications to the original model parameters are studied. A discussion on the effects of these parameters is also given. At the second scale, we pay attention to metrics relating to the network as a whole: phase synchrony among neurons and role topological structure plays. To this end, the effects of various methods of network initialization as well as application of external input are explored and discussed.

PD.31. Identification of a sleep-promoting region in the brain of a diurnal rodent

James R. Allen, Senior, Molecular Cellular Biology and Psychology, LAS
Mentor: Megan Mahoney, Comparative Biosciences, VMED

ABSTRACT

Sleep is a naturally recurring biological process essential for virtually every known species of animal including humans; the underlying neuroanatomical basis for its function, however, is not fully understood. Most research examines sleep in rodents such as rats and mice; these nocturnal species may not serve as a good model for diurnal humans. We used the diurnal rodent *Octodon degus* to study the neuroanatomy underlying sleep. The ventrolateral preoptic nucleus (VLPO) is a mammalian hypothalamic nucleus suggested to have a critical

role in sleep regulation. Galanin, a widely distributed and highly conserved neuropeptide, has been suggested as a suitable marker for the VLPO. Here we wanted to characterize the location and expression of galanin in the VLPO of *Octodon degus*. The distribution of galaninergic immunoreactivity was studied in the brains of colchicine injected and control *Octodon degus*. Colchicine inhibits axonal transport and results in an accumulation of the neuropeptide at the neuronal cell body. We used immunocytochemistry to stain coronal brain sections of neuronal tissue with a galanin antibody. Preliminary results suggest galanin content in several distinctive brain areas including the VLPO. Identification of the VLPO was based on galanin content, relative location within the brain atlases of the rat and mouse, and approximation from previously published degu studies. We also identified galanin peptide distribution in areas which parallel that of the rat and mice galanin distribution profiles including the supraoptic nucleus, paraventricular hypothalamic nucleus, medial forebrain bundle, nucleus of the diagonal band, lateral septum, and spinal trigeminal area. Comparison of galanin distribution in the *Octodon degu* with well-studied animals such as the rat, mouse, etc. will suggest conserved neural regions which regulate sleep across species.

PD.32. The effects of amphetamine exposure during adolescence on inhibitory control behavior in adulthood in male rats

Maria Fernanda Piñeros-Leaño, Senior, Psychology, LAS
Mentor: Joshua M. Gulley, Psychology, LAS

ABSTRACT

During adolescence, individuals are prone to engage in risky behaviors, including the consumption of alcohol and other drugs. Also during this time, brain areas such as the prefrontal cortex are undergoing significant changes in structure and function that are a normal process of development into adulthood. Thus, drug exposure during this time period may have adverse consequences that persist into adulthood. To date, there has not been much research analyzing the unique effects of drug exposure in adolescence compared to adulthood. The study we propose will address this shortcoming by using an animal model (rats) to determine if exposure to amphetamine during adolescence will alter motivated behavior that is known to be sensitive to disruptions in medial prefrontal cortex function. We hypothesize that rats exposed to amphetamine during adolescence will exhibit deficits in task behavior compared to saline-exposed controls, which would suggest that this early drug exposure had long lasting consequences in the function of the medial prefrontal cortex.

PD.33. Is TV controlling your diet?

Chris Oberst, Junior, Community Health, AHS
Lauren Anderson, Senior, Communication, LAS

Lezlee Gaither, Senior, Interdisciplinary Health, AHS
Mentor: Brenda Davis Koester, Family Resiliency Center

ABSTRACT

The purpose of the STRONG Kids program is to examine how a variety of factors such as family, community, and media contribute to the development of a child's health. The STRONG Kids survey, consisting of approximately 90 pages, was distributed to 425 parents in the Champaign/Urbana area. The questions in this survey looked at a variety of factors regarding the children in the household, ranging from where they attend school, their amount of physical activity, eating habits, and much more. In our research, we will be looking specifically at the amount of healthy versus unhealthy food consumed in each household in relation to the amount of time the television is on during family meals.

PD.34. Exploring home literacy practices and parental beliefs for children with writing delays

Elizabeth S. Pelletier, Senior, Speech and Hearing Science, AHS
Eileen P. Kerins, Junior, Speech and Hearing Science, AHS
Mentors: Cynthia Johnson, Speech and Hearing Science, AHS; Julie Hengst, Speech and Hearing Science, AHS

ABSTRACT

The development of literacy both reading and writing in children with language delays and disorders is included in the scope of practices of Speech-Language Pathologists (ASHA, 2011). However, both in clinical practice and research more attention is devoted to reading than to writing abilities. To address this, our current study represents one piece of a larger intervention study comparing two writing programs, Written Expression Begins (WEB) (Johnson et al., 2005) and Writing to Read (WTR) (Martin and Friedberg, 1986). The current study focuses on describing the home literacy environment and parental beliefs for three of the six children of the larger study. Home observation and family interview data are presented on three early school-age children with language impairments. The participants were a set of twin boys, both with phonological and specific-language impairments, and the third child was a boy with an expressive language delay—an element inherent with his diagnosis of Autism and Attention deficit hyperactivity disorder (ADHD). We are focused on data collected through an initial interview, questionnaire, home tour, writing sample, and final interview. Through transcription and assessment of the interviews, parental beliefs were shown to be highly supportive of a literate child. The analysis of all data collected revealed literacy rich environments and encouraging parental attitudes toward their child's developing literacy, despite the fact that the children displayed expressive language disorders. The persistence of the language disorders may indicate that other factors such as genetics, interest level of the child, and fine motor skills are affecting the language development. However, for these three

children with language impairments, home literacy presaged gains made during writing intervention (Johnson et al., 2005) and provided a context for the child to apply those gains.

PD.35. Synthesis of graphene

Maninpat Navroj, Junior, Materials Science and Engineering, ENG

Mentor: Jim Zuo, Materials Science and Engineering, ENG

ABSTRACT

Interest in graphene has exploded in recent years due to its unique characteristics and properties. Its extraordinary electronic properties may open the door to a new age of electronic devices. However, fabrication of high quality graphene is a reoccurring challenge. Many methods have been introduced, including mechanical exfoliation, liquid-phase exfoliation, growth on metal and SiC substrates, gas-phase synthesis, and reduction of graphene oxide. All these methods have their advantages and disadvantages depending on the application they are fabricated for. The focus of my research work has been to find the most optimal way to synthesize single layer graphene. I have work with the liquid-phase and chemical vapor deposition (CVD) methods. These two methods have shown promise in their own respective way. Characterization of graphene has been done mainly on the transmission electron microscopes (TEM) in MRL.

PD.36. Characterization of anxiety-like behavior and depressive-like symptomology in two strains of mice with impaired responsiveness to estrogen

Christopher Johnson, Senior, Psychology, LAS

Mentor: Megan Mahoney, Veterinary Biosciences, LAS

ABSTRACT

Circulating estrogen affects mood, depression, and anxiety in animal and human studies. Estrogen exerts anti-anxiety effects via the estrogen receptor 2 isoform but it remains unknown if estrogen also modulates mood via non-classical pathways. To better understand the mechanism of estrogen action on anxiety and depression, we used estrogen receptor 1 knock-out (ERKO) and non-classical estrogen receptor knock-in (NERKI) mice. ERKOs lack estrogen receptor alpha (ESR1) subtype, but produce estrogen and have active beta-type estrogen receptors (ESR2). NERKIs have a nonfunctional binding domain for ESR1 but can respond to estrogen via non-classical pathways. We used ERKO, NERKI and wildtype (WT) male and female mice to determine if there are sex or genotype differences in anxiety and depressive-like behaviors. Animals were tested in the elevated plus maze for anxiety-like behavior and the forced swim test for depressive symptomology. We also studied anxiety-like behaviors that may not have correlations to human behavior, such as nesting, marble burying, and burrowing. Preliminary results suggest that the ability to respond to estrogen affects some, but not all, behaviors tested. In the elevated plus

maze, WT females spent significantly less time ($p < 0.05$) in the open arms than did ERKO females but there was no genotype difference between males. In the burrowing test, there is significant effect of genotype ($P = 0.014$) and a significant interaction between genotype and sex ($p = 0.023$). WT males had the least burrowing behavior relative to other groups. These data will help elucidate the molecular mechanisms of estrogen action on anxiety-like behavior and depressive symptomology.

PD.37. Does membrane fusion during the sperm acrosome reaction occur at membrane rafts?

Amanda C. Hankes, Senior, Animal Sciences, LAS

Mentor: David Miller, Animal Sciences, LAS

ABSTRACT

The acrosome reaction is a major part of sperm's ability to bind to the ZP and fertilize an oocyte. Some infertility problems involve the acrosome not being able to react and release its contents. I believe an increased knowledge of the acrosome reaction may help infertility problems in the future. I would like to clarify fusion between the acrosomal and plasma membrane of sperm during the exocytosis of the acrosome. This process is believed to take place at membrane specializations called rafts that can be identified microscopically by the presence of GM1 ganglioside. I want to follow the movement of GM1 and see if this raft co-localizes with a protein, called syntaxin, important for fusion of acrosomal and plasma membranes to better understand the fertilization process. GM1 is a ganglioside that localizes in rafts in many somatic cells and can be labeled with fluoresceinated subunit of cholera toxin (CTB). SNARE proteins are also required during the fusion of membranes in the acrosome reaction. Syntaxin is a SNARE protein found on the sperm plasma membrane. I would like to test the theory that syntaxins in the plasma membrane co-localize with rafts in an acrosomal membrane and create the pores responsible for establishing the acrosome reaction. It is also unclear of the initial location of syntaxins before the acrosome reaction, and I hope to find this out.

PD.38. Teachers' perspectives of charter schools

Madeleine Lynch, Sophomore, Elementary Education, EDU

Mandy Moore, Sophomore, Elementary Education, EDU

Mentor: Sheila Dean, Curriculum and Instruction, EDU

ABSTRACT

Charter public schools have received a great deal of attention recently in the United States. A charter public school is a non-religious public school operating under a contract or charter that governs its operation. Charter schools have evolved over about two decades as a way to experiment with education innovations and provide public school choice. Charter schools are similar to public schools in that they are publicly funded; they may differ from public schools in

their organization, curriculum and instruction, support programs, etc. There are currently thirty nine states with charter school laws, with a total enrollment of about one and a half million students, and the current Department of Education is promoting charter schools as a major route to school improvement. Although high-quality teachers are essential for the educational success of any school, little research exists on charter schools ability to recruit talented teachers. This study addresses the question: How do prospective elementary teachers view charter schools as they enter the labor market, apply for teaching jobs, and decide where to work? The methodology used for this study is a survey of senior education majors at the University of Illinois with regard to their knowledge of-- and interest in applying for teaching jobs at charter schools in Illinois. This study has implications for teacher education programs with regard to educating pre-service teachers about charter schools and for charter schools ability to attract job applicants from highly rated teacher education.

PD.39. Illinois bridge to China: Survey, design, and optimization of bridges in rural China

Qiyuan Gou, Senior, Civil Engineering, ENG

Zhe Zhao, Senior, General Engineering, ENG

Julie Fry, Junior, Civil Engineering, ENG

Mentors: J. Bruce Litchfield, Agricultural and Biological Engineering, ENG; Valeri A. Werpetsinski, Center for Teaching Excellence

ABSTRACT

Bridge to China (iBTC) is the first American chapter of a Hong Kong service organization dedicated to building bridges in mainland China's underprivileged rural communities. Started in September 2009, this past summer iBTC helped to lead construction of a 139 foot-long bridge in Yunnan Province, benefitting a village with more than 300 inhabitants. We present highlights of our work, including optimization of time and money usage, technical aspects of surveying for, and designing, a bridge, and starting a comprehensive website for publicity and collaboration purposes. Special emphasis will be given to the real-world aspect of inquiry-based learning. iBTC is currently working on another project along the Nujiang (or Salween) River in Yunnan Province, with the Lisu and Nu ethnicities, directly across from the China-Myanmar border. For more information, email qgou2@illinois.edu or visit <http://linc.illinois.edu/>.

PD.40. The role of temporal information in the recognition of speech sounds

Jeremy A. Lacocque, Psychology, LAS

Mentor: Robert E. Wickesberg, Psychology, LAS

ABSTRACT

The first and still-prominent theory of speech perception posits that recognizing key frequencies in speech sounds is the primary way we recognize speech. This

60-year old theory, however, does not explain how we understand speech with shifted key frequency information such as whispered speech. In an effort to reveal characteristics of speech vital to speech recognition beyond just frequency, timing patterns were examined in auditory nerve fibers action potentials throughout the presentation of speech sounds. Since chinchillas have similar peripheral auditory systems as humans, they were used in the study. Eighteen chinchillas were anesthetized and their auditory nerves exposed to record their activity. Alveolar stop consonants speech sounds /pap/, /paep/, /bab/, and /baeb/ were presented to chinchillas peripheral auditory systems by a female speaker in two ways: normally spoken, and whispered, each at three different intensities. Despite the fact that whispered speech contains different frequency information than does normally spoken speech, the experiment will hopefully reveal that each consonant evokes a similar timing pattern in the auditory nerve fibers, regardless of whether the speech sound was whispered or normally spoken. Timing patterns in the auditory nerve fibers responses were gathered and analyzed by pooling the responses from each auditory nerve fiber from each chinchilla to create a global average peri-stimulus time (GAPST) histogram. For each speech sound, a specific number and pattern of peaks in action potentials at certain points in time appeared in each GAPST histogram, independent of method of speech production, whispered or normally spoken. Each histogram revealed similar timing patterns encoded in the chinchillas peripheral auditory system for each pair of speech sounds, showing that timing information is consistent between different forms of speech production and therefore might be an important cue in how we process speech.

Participant Index

A

Ahern, Dana Theresa, PB.23
Ahn, Monica, PD.27
Alagaban, Cristina
Florig, PB.15
Alger, Jenny, PD.24
Allen, James R., PD.31
Altidis, Margarita, C.3
Anderson, Lauren, PD.33
Ang, Justin Kyan, PD.07
Anliker, Loren A., PB.08
Annetti, Kendall Leigh, PA.05

B

Barron, Leslie, C.4
Basathia, Hunyah, C.1
Bassett, Tom, C.2
Baumgartner, Kenneth, PD.25
Becraft, Jacob R., B.2
Billingsley, Jordan, PD.25
Blair, Ashton, B.4
Blumenthal, Emily, PC.25
Blumenthal, Steven, B.4
Bogue, Ellen, PB.03
Briones, Victoria F., PC.33
Bucko, Paula, C.3
Bulaon, Christopher, PD.17

C

Carey, Samuel J., PA.09
Carlson, Emily,
Featured Session
Carson, Emily, PC.09
Carter, Jared, PD.26

Chan Fong, B.5, PB.30
Chan Man Wa, PB.28
Chang, Amanda, PB.11
Chang, Hanna Y., PB.09
Chappell, Jenise, PC.27
Chayanupatkul, Sarut, PC.23
Chen, Angela, PB.11
Cheok Meng Fai, B.5
Chmielewski, Nicholas, PB.01
Christian, Braden
Boone, PA.28
Chwe, Minjung, PA.26
Cote, Peter J., B.2
Criscione, Lily, PB.24
Crowley, Richard M., A.5
Cullen, Natalie M., PD.16
Czapar, Anna, PC.01

D

Dabe, Emily Christine, PC.26
Del Rosario, Justin, B.5
Dembinski, Richard, PB.31
Desai, Kinnary, C.1
Deutsch, Hannah, PA.07
Dittmer, Erin, B.4
Donoho, Lauren R., PC.20

E

Eack, Michelle, PC.24
Easter, Kyle P., PD.12
Edakkunnathu, Giny, PA.08
Eichorst, Elizabeth
Marie, PD.03
Eiten, Megan I., C.1
Eslary, Brittany, A.2
Evans, Bridget M., C.1
Evans, Christine M., B.4

F

Felty, Matthew L., PB.28
Filicetti, Vince, PA.03
Florido, Patrick, PB.01
Foster, Erika, PD.24
Freeman, Tiffany N., PD.27
Frost, Daniel J., PB.25
Fry, Corey R., A.1
Fry, Julie, PD.39

G

Gaither, Lezlee, PD.33
Galvan, Ashley Marie, PB.29
Garcia, Olivia M., PB.24
Georginis, Katherine, PA.14
Gillman, Sara Lisa, PB.27
Gittleman, Dorian
Laura, PD.09
Gonzales, Elizabeth, PD.21
Gou, Qiyuan, PD.39
Gountanis, Seren, PC.04
Groll, Andrew Nicholas, C.2
Gruca, Collin, PA.11

H

Hall, Jared, PA.10
Hall, Stephanie Clara, PD.15
Hankes, Amanda C., PD.37
Hart, Quianna Tillisa, PC.18
Hattar, Adina, PC.10
Heller, Corinne, PC.27
Henry, Natalie, PC.31
Hermann, Andrew J., PB.02
Hitchcock, Marta, PB.19
Hochwert, Pamela
Renee, PA.07
Holden, Elsa C., B.3

Holicky, Abigail, C.4
Hollars, Jacob Foster, A.5
Homann, Kevin M., B.3
Hong, Jessica, C.1
Howard, Elizabeth, PC.22
Howell, Erin Christina, PA.25
Huang, Shanshan, PC.19

I

Iandola, Forrest, A.3
Ibrahim, Rasheed, PC.21
Ibrahim, Tahir Asmah, A.1
Ikoro, Esther Adaeze, PD.20
Intapura, Nancy, PC.22

J

Jamora, Rachel, PA.22
Jansen, Brittany A., PD.04
Jaworski, Kimberly
Anne, B.5, PB.30
Jerman, Jilber
Alexander, PC.17
Jia, Wenbo, PD.11
Jiaa, Johnston, C.2
Jinyi Ye, B.5
Johnson, Christopher, PD.36
Johnson, Stephanie, PD.06

K

Kahn, Marium, C.1
Karlak, John, PA.25
Kenwick, Michael R., A.5
Kerins, Eileen P., PD.34
Kim, Christina D., C.1
Kim, Joseph, C.2
Klein, Laura Danielle, B.3
Kocher, Samantha R., B.5

Koepke, Natalie Hann, B.5
Kolod, Melissa, PD.29
Krause, Daniel Joseph, PD.19
Kreisel, Kathleen E., PC.30
Kuok Pui San, A.4

L

Laciak, Pawel, PD.23
Lacocque, Jeremy A., PD.40
LaHood, Jennah
Elizabeth, PD.14
Lam Nga Cheng, B.5
Lane, Alex, PD.10
Larmore, Nicholas James, C.4
Lee, Justine, PD.02
Lemick, Taylor Anne,
Featured Session
Li, Katherine, C.3
Loiacono, Jessica, PB.04
Lopuszynski, Michael
Adam, PA.04
Lowry, Katie L., PD.18
Lucius, Anita, B.3
Lynch, Madeleine, PD.38

M

Mackeben, Melanie
Ann, PA.21
Malebranche, Dominique
Alexis, PB.17
Maloney, Andrew P., PC.28
Marlatt, Evan, C.1
Martin, Nick, B.4
Mayes, Marissa Ann, A.4
McCrate, Ashton, PC.14
McKean, Laura
Katherine, PA.01
McKenna, Megan
Marie, PD.05

Meyer, Tessa L., PC.12
Michelon, Christina, A.6
Miller, Daniel Scott, B.2
Minefee, Ishva, Jr., A.4
Moen, Bridgette, PC.02
Molitor, Robert, PB.22
Monteagudo, George, B.4
Montet, Benjamin Tyler, A.3
Moore, April A., PC.10
Moore, Mandy, PD.38
Moral, Francesca, PA.15
Morales, Melissa, PB.26
Moran, Carolyn
Margaret, PA.20
Moy, Lana A., PA.11
Mui, Travis, PC.32
Muñoz, Luis Rolando, PB.12
Myers, Laura, PC.18

N

Nadell, Amy, PA.07
Naganuma, Mari, PA.27
Nassaruddin, Mohammad, C.1
Naviroj, Maninpat, PD.35
Nekoliczak, Annie M., PC.13
Nelson, Katrina, PC.30
Nestor, Jennifer, A.2
Niaz, Aina S., PB.32
Nold, Kirsten, PB.13

O

Oberst, Chris, PD.33
Ostick, Benjamin, A.5
Osunero, Theresa, C.1

P

Packard, Alexandria

Rebecca, PB.10
Pang, Ran, PA.17
Pantoja, Gabby, PB.14
Paris, Natasha, PB.05
Park, Stephany L., PA.19
Patel, Monika K., PD.08
Pearson, Lisa Ann, PD.28
Pelletier, Elizabeth S., PD.34
Penalber, Laurie, PC.10
Pesch, Nina, PB.14
Peters, Sarah E., PA.18
Petro, Gina C., PD.22
Philizaire, Carla, PB.27
Piñeros-Leaño, Maria
Fernanda, PD.32
Pontarelli, Kasey L., PA.14
Price, Dawson John, PB.16

R

Ramirez, Brett, C.2
Rana, Payal, C.1
Rao, Shruthi, PB.18
Reed, Katherine, PA.25
Regan, Caitlin L., PD.16
Reid, Jenna, PB.07, PC.22
Revethis, Andrea, PA.02
Richardson, Ryan, C.3
Rivera, Chris, PB.14
Robinson, Amanda Lynn, A.1
Rogers, Jennifer, PD.02
Ross, Courtney, C.3
Rutas, Kristina N., PC.27
Ryu, Richard, PB.01

S

Saladi, Shyam M., B.2
Sams, Elizabeth, C.1
Santoso, Philip, A.2

Scavuzzo, Claire
Jacqueline, PA.19
Schaefer, Sarah E., PA.15
Schleicher, Stephen, PC.06
Schmidt, Ryan A., A.4
Schmitt, Lou, PB.14
Schroeder, Adam R., B.1
Sciortino, Sarah, PB.19
Senseng, Mary Grace, C.1
Seul, San, B.5
Shetina, Michael, B.4
Shmukler, Symon, C.1
Smerz, Jacqueline Mary, PA.16
Smith, Maxwell, B.1
Song, Sonny Yuan, PD.13
Spitz, Jaclyn, PC.11
Sprague, Emily, A.3
Stadnicki, Karol A., PC.05
Stefani, Felicia, PB.21
Stoudmire, Sydney, A.6
Susai, Ajith R., PB.02
Swanigan, Kasandra, PB.28
Switts, Ryan, PC.32
Szyzka, Kate,
Featured Session

T

Teng Teng Lao, PB.28
Teymourpour, Shayda, PA.15
Tham, Pui Yin, PC.08
Thomas, Esther Faye, PA.06
Thomas, Kevin M., PB.05
Thomas, Suravi
Gongulee, PA.12
Tibbs, Rebecca
Breanne, PC.03
Topolinski, Catherine, C.4
Torres, Jessica A., PA.14
Tsarpalas, Jenna, PA.13

Tulley, Stephen, PB.01
Tunney, Margaret Ann, PC.16

U

Umeno, Risa, PA.11

W

Wang, Felix, PD.30
Wang, Peiyi, A.1
Ward, Timothy Michael, B.1
Weng, Timothy, PB.06
Wetzel, Anna J., PB.02
White, Amanda, PB.14
Wilkinson, Tiffany, PB.19
Willard, Stephanie D., PC.29
Williams, Collette L., PC.15
Wills, Courtney, PD.24
Wilson, Krystal, PD.27
Wong, Min Hao, PC.07, PC.08

X

Xeros, Athanasia E., C.2

Y

Yan Yiting, B.5, PB.30
Yang, Jenny, PD.01
Yee, Nathan, A.1
Yin, BoYa, PA.24

Z

Zabrin, Lauren Dyan, PB.20
Zacharia, Ramsen E., PA.23
Zhao, Zhe, PD.39
Zibrat, Rachel Ann, A.4

Mentor Index

A

Abbott, Ann, PB.14
Abbott, Tim, PD.14
Aldridge, Georgina M., PB.18
Alexandre, Maria, A.4
Anderson, Maria Cynthia,
A.4, B.5, PA.09
Andrade, Flavia, PC.17, PD.20

B

Bahr, Janice, B.3
Bailey, Anne Bostrom, PC.10
Baillargeon, Renee, PD.22
Bauer, Dale, C.3
Beller, Andrea, PA.26
Bengtsson, L. Ola, A.5
Berenbaum, Howard, PC.19
Bezryadin, Alexey, A.3
Black, Angela Rose, PC.18
Braatz, Richard D., PC.07
Bretl, Timothy, PC.21
Brunner, Robert, A.3
Burgos, Adrian, Jr., A.4
Burke, Sandi, PA.20,
PA, 22, PB.15

C

Caetano-Anolles,
Gustavo, PA.12
Chasco, David, PD.25
Cheibub, Jose Antonio,
A.5, PC.24
Chu, Chia-Ching, PA.17
Chung, Soon-Jo, C.2
Cimpian, Andrei, PB.16

Clancy, Kathryn, B.3, PB.23
Cook, Marc D., PC.15
Crane, Corinne, B.4

D

Dean, Sheila, PA.07, PC.20,
PC.30, PD.08, PD.24, PD.38
DeThorne, Laura S., PB.03
Dev, Dipiti, PA.14
Diehl, Paul, PA.27,
PC.05, PC.24
Dill, Brian, A.4

E

Espelage, Dorothy, PB.17

F

Fabiani, Monica, PB.06
Farner, Susan, PB.01
Faulkner, Dan, PC.09
Federmeier, Kara D., PB.25
Flinn, Margaret, PA.13
Flint, Colin, PA.10,
PA.16, PB.31

G

Gaines, Brian, PC.28
Galvez, Roberto, PB.29
Gandhi, Rajmohan, PB.32
Garnsey, Susan, PD.23
Garrow, Timothy, A., PD.18
Geary, James, PA.09, PA.24
Goddard, Lynford, PD.26
Gottlieb, Alma, A.4
Gratton, Gabriele, PB.06
Greco, Donald, C.4

Green, Angela, PB.08
Gulley, Joshua M., PD.32

H

Hadley, Pamela, PD.03,
PD.04, PD.05
Hammons, Amber, PA.11,
PD.09, PD.15, PD.28
Hastings, Laura, PB.04
Hayek, Jay, B.1
Hengst, Julie, PD.12
Hepler, Justin, PB.09
Husain, Fatima, PC.27, PC.29

I

Ireland, Frank, PC.09

J

Jin, Yong-Su, PD.01
Johnson, Cynthia, PD.34
Jones, Blake, PA.15,
PA.25, PD.17
Jones, Erin L., PB.22
Jones, Krista, PB.15

K

Kalafatis, Marinos, PB.24
Kapoor, Ashish, PC.11
Kenis, Paul, C.2
Kim, Juhee, PD.13, PD.27
Kim, Jungwon, PA.27
Kim, T. John, PC.25
Kling, Gary, A.1
Koester, Brenda Davis,
C.4, PB.05, PD.33
Korol, Donna, PA.19
Krassa, Teresa, PA.01,
PA.02, PA.08

L

Laosebikan, Olanipekun, B.5, PB.13
Leckband, Deborah, B.2
Lee, Soo-Yeun, PD.19
Leff, Carol, PA.03
Levinson, Stephen, PD.30
Litchfield, J. Bruce, PD.39
Loucks, Torrey, PC.03
Low, Kathy, PB.06
Luo, Yunzi, PA.28

M

Ma, Jian, B.2
Mahoney, Megan, PD.31, PD.36
Marinov, Darko, C.2
Martin, Steven, PD.06
Mateus-Pinilla, Nohra, PA.05
McBride, Brent, PC.16
McElwain, Nancy, PB.07
de Mejia, Elvira, B.3, PB.21, PC.12
Meyer, Eric, Featured Session
Miler, Kristina, PB.20
Miletic, Marina, PC.08
Miller, David, PD.37
Mondak, Jeff, PC.06
Morgan, Lucinda, B.5, PA.09
Morley, Elizabeth, B.4
Mosley, Michelle, A., PA.21

N

Nardulli, Peter, A.2
Notaro, Stephen, C.1, PD.29

O

O'Brien, David, A.6
O'Brien, Matthew, A.3
Odom, Susan, PC.23

P

Pack, Daniel W., B.2
Pals, Justin, PD.07
Petruzzello, Steven J., PC.13
Plewa, Michael J., B.3
Pratt, Nathan S., PD.11

R

Rao, Chris, PB.11
Rashid, Salim, PA.18
Rhodes, Justin, B.2, PC.26
Roberts, Brent, PD.21
Rodriguez, Luis, C.2
Romero, Michael, PC.01
Rosas, Gilberto, PC.33
Ross, Brian, PB.22
Roy, Somnath Baidya, B.1
Rush, Dana, A.6
Ruzic, David, C.2

S

Santos, Carla, PC.14
Schneider-Garces, Nils, PB.06
Schroeder, Charles, A.1
Seufferheld, Manfredo, PA.17
Shashikanth, Nitesh, B.2
Simons, Daniel, PC.31
Smith, Douglas, C., PD.16
Smyth, Bill, PC.04
Sosnoff, Jacob J., PB.02
Strauser, David, PB.19, PC.22

Suarez, Andrew V., A.1
Sulkin, Tracy, PA.23
Svolik, Milan, PA.16

T

Teran-Garcia, Margarita, PB.26

V

Vasquez, John, A.5

W

Waldrep, Lee, PD.25
Watkin, Kenneth, PA.06
Wedig, Tim, PA.27
Weinberg, Shelley, PA.04
Werpetinski, Valeri A., PD.39
Wickesberg, Robert E., PD.40
Winter, Matt, PA.04
Winter-Nelson, Alex, PB.04
Winters, Matthew, PC.24

X

Xu, Wenyu, PC.32

Y

Yafremava, Liudmila S., PA.12

Z

Zuo, Jim, PD.35



I L L I N O I S

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Sponsored by the Office of the Vice Chancellor
for Academic Affairs and Provost

provost.illinois.edu/ugresearch

Organized with support from

Cristina Stanciu, Graduate Intern

Nikki Hodge, Office Administrator

Gennifer Gilbert, Special Events Coordinator

Emily Pinheiro, Undergraduate Intern