

## **INDIVIDUAL PROJECTS**

### **COOPERATIVE PLAY AND GENDER-TYPED ACTIVITY AT CHILDREN'S MUSEUMS**

Presenter: Alesi, Danielle  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Gregory Braswell  
Author(s): Danielle Alesi

Various studies have highlighted the importance of cooperative play in preschool children. Creative play facilitates goal setting, problem solving and negotiation. It has also been established that gender-typed activity is prevalent in children from a very young age. Male children will tend to choose masculine toys over feminine toys and vice versa. The current research aims to identify whether gender-typed activity exists in cooperative play at exhibits in a children's museum. Previously collected data is analyzed to see whether one gender was more likely to engage in cooperative play than the other. Specific, gender-typed exhibits were also observed to examine whether the gender they were geared towards tended to visit them more frequently. Two hundred and sixty children ranging in age from two to eight were observed at the local Children's Discovery museum. Various aspects of the children's play were observed, a few of which focused on the degree to which the child interacted with anyone else while playing at the exhibit. Findings from this study may be useful in helping children's museums enhance their exhibits in fostering cooperative play and gender neutrality.

### **ANISOTROPIC SILVER-GOLD CORE-SHELLS AS A SUBSTRATE FOR SURFACE ENHANCED RAMAN STUDY**

Presenter: Alves Ferreira, Rafael Augusto  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Jun-Hyun Kim  
Author(s): Rafael Augusto Alves Ferreira, Rafael Francisco Ishikawa, Brett Boote, Jun-Hyun Kim

We report the highly simple synthetic strategy to prepare metallic silver-core gold-shell nanoparticles possessing tunable absorption properties. The diameters of the cores and thickness of the shells were easily controlled by the molar ratio of silver to gold salt solutions at room temperature. Subsequently, the systematic transformation of the core-shell particles to anisotropic structures was achieved under visible light irradiation. The nanoparticles were thoroughly characterized by UV-visible spectroscopy, scanning and transmission electron microscopy, and dynamic light scattering. In addition, the resulting anisotropic bimetallic nanoparticles were employed in a Raman spectroscopy (SERS) study and exhibited enhanced detection of surface bound molecules.

### **PRE-SERVICE PHYSICAL AND HEALTH EDUCATION TEACHERS COMMITMENT TO PHYSICAL ACTIVITY PARTICIPATION**

Presenter: Andricopulos, Jessica  
Mentor Department: Kinesiology and Recreation  
Faculty Mentor(s): Prof. Skip Williams  
Author(s): Jessica Andricopulos, Skip Williams

Introduction: An effective physical educator is an instructor that participates regularly in physical activity and values physical activity for health, enjoyment, challenge, self-expression, and/or social interaction. Regularly participating in physical activity has been shown to enhance the musculoskeletal health of individuals, improve one's mental health and mood, and increase one's energy level. It is essential that instructors maintain high levels of physical and mental health, which is attained through physical activity, in order to effectively teach physical education. In addition, it is imperative that physical educators are role models for their students. In order to positively influence physical education students to regularly participate in physical activity the instructor must participate in physical activity themselves. Purpose: The purpose of this study was to examine pre-service physical and health education teachers' commitment to physical activity and current physical activity participation. Methods: Approximately 65 pre-service physical and health education teachers' participated in the study. Participants completed a two part questionnaire consisting of 20 questions to assess their commitment to physical activity and current physical activity participation. Part one of the questionnaire was the Feelings about Physical Activity Inventory (Nielsen & Corbin, 1986). This part consisted of 12 questions pertaining to the participants' commitment to physical activity. The second part was the

Physical Activity Questionnaire for Adults (PAQ-AD). This part consisted of 8 questions that focused on the participants' physical activity levels in the past seven days. All participants completed this questionnaire through select survey. Results: Prior to data collection IRB approval was obtained. Data has been collected and is currently being analyzed. Conclusions: With the present day obesity epidemic at large it is vital that future physical and health educators not only value physical activity, but are committed to staying physically active throughout their teaching career as well. The reason for this is because physical and health educators are one of the most influential role models. When physical educators participate regularly in physical activity they are demonstrating the importance of being physically active to their students.

### **EXPLICIT AND IMPLICIT BIAS OF EUROPEAN-AMERICAN YOUNG ADULTS REGARDING HISPANICS IN THE U.S.A**

Presenter: Arreola, Freddy  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Eros DeSousa  
Author(s): Freddy Arreola

Two studies will be conducted to identify explicit and implicit bias. The first study consists of a structured questionnaire regarding the level in which Hispanics are seen as American and/or as part of the American society. The second study consists of the Affect Misattribution Procedure (AMP) which is expected to assess hidden bias from participants (Payne et al., 2005). The results will yield previously identified patterns regarding explicit and implicit bias. This study also examines micro-aggressions across academic and professional settings of men and women. The study also examines manner in which Latinos are portrayed in the Media.

### **THE IMPACT OF OVERHEARING ON YOUNG CHILDREN'S USE OF THE SPATIAL TERM 'BETWEEN'**

Presenter: Bianchi, Lindsay  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Alycia Hund  
Author(s): Lindsay Bianchi

One of the primary ways children learn language is by hearing others speak. Whether from their parents or teachers at school, children are exposed to novel words on a daily basis, thus facilitating vocabulary growth. Recent evidence demonstrates that 2-year-old children are equally good at learning novel words when they overhear them as a third party as when the words are directed toward them (Akhtar, Callanan, & Jipson, 2003). Moreover, we know that 4- and 5-year-old children benefit from directive prompting in supporting their use of complex spatial terms such as 'middle' and 'between' (Foster & Hund, 2012). The present study investigated the influence of overhearing and prompting on young children's use of the spatial term 'between,' using a slightly younger age range to clarify growth in children's spatial language abilities. Eighteen children 3 to 5 years of age completed Language Production and Comprehension tasks to evaluate their knowledge of a variety of spatial terms. This included asking them to describe the location of an object in relation to another object, as well as to mark a picture to indicate a certain location based on verbal directions. They also completed a direction-giving task in which they were asked to give directions to help a doll find a hidden object inside a dollhouse. Children either overheard an experimenter use the term 'between' 8 times, were given a direct prompt using the term 'between' ("I see two baskets. Is it in the one between the chairs or the one by the chair?"), or were given a non-directive prompt ("I see two baskets. Can you tell the doll anything more?"). Direction-giving sessions were transcribed verbatim to facilitate coding of children's spatial language, especially the term 'between.' Children who heard the term directed towards them used 'between' significantly more frequently than did those in the other conditions, regardless of age. As expected, older children (4 to 5 years) produced the term 'between' more frequently than did younger children (3 years). Moreover, older children produced and comprehended more spatial language overall. These results support the idea that children's understanding of spatial language and concepts strengthens across early childhood. Moreover, young children benefit most from direct instruction related to complex spatial terms.

## **ATTITUDE TOWARDS ROLE MODELING FITNESS BEHAVIORS AND ACTUAL FITNESS AMONG PRE-SERVICE PHYSICAL AND HEALTH EDUCATION TEACHERS**

Presenter: Bohman, Brienne  
Mentor Department: Kinesiology and Recreation  
Faculty Mentor(s): Prof. Skip Williams  
Author(s): Brienne Bohman, Skip Williams

Introduction: "Do as I say" "Don't do as I do" is an attitude portrayed among many health professionals including those in the field of physical and health education. "A great teacher inspires". They inspire through their actions and behaviors. Future physical and health educators should be good role models of fitness. Testing of fitness levels among pre-service physical and health education teachers is scarce in undergraduate programs. But why? Testing fitness levels should be essential. It is proven in a study by Melville and Maddalozzo (1988) that physical educators who displayed good levels of cosmetic fitness had a more positive influence on students exercise behaviors than unfit educators. The habit of having good fitness levels and perceptions needs to start here at the undergraduate level. Purpose: The purpose of this study was to examine the correlation between pre-service physical and health education teachers' fitness levels and attitudes towards role modeling. Methods: The participants were 65 pre-service physical and health education teachers' from one Midwest University. The participants ranged from freshmen to seniors between the ages of 19-27. Participants completed the Fitnessgram health-related fitness assessment and the Attitude Toward Role Modeling Scale (Cardinal et al., 1998). The Fitnessgram assessments included the pacer, push-up, sit-up, trunk lift, and sit and reach test. The Attitude Toward Role Modeling Scale consisted of 16 statements and describes a role model as "...a person whose behavior and attitude conform to that which society or other social groups expect of a person in her or his position, and who has become an example for others to emulate" (p.629). Each statement was assessed on a 5-point Likert Scale. Results: Approval from IRB was granted prior to data collection. Data for this project has been collected and we are currently in the early stages of data analysis. Conclusions/Future Directions: Being a role model is a powerful fitness tool and future health professionals should be expected to maintain a certain fitness standard.

## **DEVELOPING FLUENCY AND CONFIDENCE IN BILINGUAL READERS THROUGH READER'S THEATER**

Presenter: Bollinger, Sarah  
Mentor Department: Curriculum and Instruction  
Faculty Mentor(s): Prof. Pauline Clardy  
Author(s): Sarah Bollinger

The after-school bilingual Reader's Theater program is designed to help students in grades 1-5 develop better reading fluency, accuracy, and comprehension. It will provide a fun and meaningful environment to fully engage young readers. Other reading strategies targeted will be rate, expression, purpose and understanding. The culminating project will be a skit or play put on by the students at the end of the semester. Students will be recorded reading at the beginning and at the end of the semester and then rated accordingly to accurately measure progress in fluency. By further developing a solid foundation in a bilingual student's Spanish literacy skills, they will have more experience and confidence to further improve their English literacy skills.

## **OPTIMIZATION OF WATER-BASED EXTRACTION OF EGCG AND CAFFEINE FROM GREEN TEA PRODUCTS**

Presenter: Brackemyer, Chase  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Jun-Hyun Kim  
Author(s): Chase Brackemyer, Jamie Sullivan, Jun-Hyun Kim

This study describes various strategies to optimize the extraction of epigallocatechin gallate (EGCG) from green tea products in aqueous solution. The concentration of EGCG as a function of the size of the green tea leaves and brewing time upon treatment of agitation, sonication, filtration, and centrifugation was examined by high performance liquid chromatography. Among these approaches, the agitation of small size of tea leaves was found to be the most effective and fastest method to extract the highest concentration of EGCG. Since EGCG in green tea is a major healthy compound and possesses various health benefits ranging from relieving stress to anti-oxidant, anti-allergy, and anti-carcinogenicity properties, presenting an effective extraction method utilizing commonly accessible household tools can allow for many green tea consumers to take the highest advantage while enjoying their cup of tea.

## **NURSES' PERCEPTIONS OF EHRS, CLINICAL JUDGMENT AND TEAM COMMUNICATION**

Presenter: Braker, Lynnae  
Mentor Department: Nursing  
Faculty Mentor(s): Prof. Susan Kossman  
Author(s): Lynnae Braker, Susan Kossman

**PURPOSE AND BACKGROUND:** Nurses need to quickly process information to form clinical judgments, communicate with the healthcare team and guide optimal patient care. Electronic Health Records (EHRs) offer potential for enhanced care but also introduce unintended consequences through changes in workflow and information processing needed for clinical judgment and communication. The purpose of this qualitative part of a larger study was to explore nurses' experiences using selected EHR tools and self-made work lists, and their impact on clinical judgment and effective communication. **CONCEPTUAL FRAMEWORK:** Tanner's Clinical Judgment Model, which deconstructs judgment into four dimensions (Noticing, Interpreting, Responding and Reflecting), provided a conceptual framework and basis for questions and analysis. We added questions about general communication. **Method:** This qualitative portion of a larger mixed-methods study included in-depth interviews and observations of seven nurses at one hospital as they used EHR and self-made tools and a focus group interview of four nurses at the other hospital. Interviews were transcribed and coded by both investigators. Content analysis identified themes. **RESULTS:** Themes identified are "Accessing Information" [finding information, information display]; "Organizing Information" [My organization supports my thinking]; "Comfort Using and Customizing EHR Tools" [Knowing how to use EHR helps me find information, Conform, don't change it]; "It's not all Good...or Bad" [supports clinical judgment & communication, helps me avoid errors, interferes (can't find information, too much effort or time to use tool)]. **CONCLUSION:** Nurses from the two hospitals expressed different levels of satisfaction with the EHR tools' ability to support their clinical judgment and communication. One group felt the need to conform to what was presented to them, while members of the other group felt more comfortable customizing the EHR to better fit their needs. In general, nurses noted variability in how tools are used and tension between personalized information, organization/display, and effective communication. Nurses reporting more training, knowledge and experience with EHR tools felt more comfortable using tools to support nursing work.

## **TRAPPING TIME RESONANCES IN A MODIFIED HARRIS NEUTRAL LINE MAGNETIC FIELD**

Presenter: Brennan, Connor  
Mentor Department: Physics  
Faculty Mentor(s): Prof. Richard Martin  
Author(s): Connor Brennan, Richard Martin

The behavior of particles in the Earth's magnetic tail is not entirely understood. Through our research, we attempt to further characterize the neutral line magnetic field in the Earth's magnetotail. Previous work on a related magnetic field, the current sheet model (a magnetic field reversal), shows a "resonance" in which the time the particle spends in the current sheet region is maximized at multiples of the fourth root of the energy. This resonance is due to altered particle dynamics at these energies. We examine these resonance behaviors using Surface of Section Plots, where resonances will appear as a phase space symmetry. Our results to date indicate that the neutral line magnetic field contains no such resonances, which agrees with a lack of symmetry in our X-Line Surface Of Section Plots.

## **RHENIUM BASED CLUSTER COMPLEXES CONTAINING OXAZINE AND OXAZOLINE LIGANDS**

Presenter: Bruck, Andrea  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Lisa Szczepura  
Author(s): Andrea Bruck, Joan Tirado, Lisa Szczepura

Studies in the Szczepura group have focused on the synthesis of terminal heterocyclic ligands on the hexarhenium cluster cores  $[\text{Re}_6\text{Se}_8]^{2+}$ . The  $[\text{Re}_6\text{Se}_8(\text{PEt}_3)_5(\text{MeCN})](\text{BF}_4)_2$  and  $[\text{Re}_6\text{Se}_8(\text{PEt}_3)_5(\text{PhCN})](\text{BF}_4)_2$  complexes were used to investigate the haloalcohol cyclization forming 1,3-oxazine and 1,2-oxazoline ligands. The focus of this study was to optimize the yield and purity of the oxazine and oxazoline complexes by varying reaction conditions and attempting various purification methods. In this presentation we will discuss the results of our optimization studies and our preliminary investigation into the potentially catalytic formation of 1,3-oxazine.

## **A CLINICAL GUIDE ON COGNITION AND AGING FOR PRACTICING SPEECH LANGUAGE PATHOLOGISTS**

Presenter: Brue, Kaylee  
Mentor Department: Communication Sciences and Disorders  
Faculty Mentor(s): Profs. Jennine Harvey and Rene McClure  
Author(s): Kaylee Brue

Speech-Language Pathologists have a wide scope of practice. We are certified to be competent across multiple areas of clinical practice including cognitive-communication disorders (ASHA, 2005). According to the American Heritage Medical Dictionary (2011), cognition is the mental process of knowing, including aspects such as awareness, perception, reasoning, and judgment. Due to speech- language pathologist's large scope of practice, clinical guides are useful tools. A clinical guide is a resource that allows a clinician to have a large amount of information about a subject in a condensed form. As cognitive aging is an exorbitant subject that can have differences in severity of impairment, a clinical guide can be a useful resource for a clinician. The purpose of this project was to create a clinical guide for cognitive aging to be used by a Speech Language Pathologist. It will be a resource for practicing speech-language pathologists who frequently work with individuals with cognitive deficits. Cognitive disorders fall within our scope of practice, and can include deficits in attention, memory, sequencing, visuospatial skills, and executive functioning. This project includes two phases. During phase one, I conducted a systematic search of literature for cognitive aging including: normal aging and cognition, mild cognitive impairment, and dementia. During phase two, I created the cognitive aging guide. In this guide, I define three specific subtypes of cognitive aging, review and discuss differential diagnosis, and introduce treatment techniques that are available to clinicians for intervention.

## **GANDHIAN ECONOMIC THEORY: AN ALTERNATIVE ROUTE TO HUMAN PROSPERITY**

Presenter: Comstock, Sidney  
Mentor Department: History  
Faculty Mentor(s): Prof. Sudipa Topdar  
Author(s): Sidney Comstock

My research aims to closely study Gandhian Economic Policy between 1900 and 1945. The research is based on careful analysis of Gandhi's writings particularly, his once banned book titled, *The Hind Swaraj* (1909) known in the West primarily for its critique of Western "modernity." In addition to Gandhi's writings, I analyzed the writings of Jawaharlal Nehru, the first Prime Minister of India, and Dadabhai Naoroji, the first Indian Member of British Parliament, to get a broad view of the economic discourse during the Indian Nationalist movement. My poster highlights how Gandhi's economic ideology presented a radically different path than both Liberal and Socialist economic theory. Gandhian economics held the possibility for a different path for humanity which emphasized religion as the primary human pursuit. My research mostly focuses on why Gandhi's policies were not implemented in independent India based on a careful analysis of the Nationalist Movement. Additionally I examine how Gandhian economic policy can be understood in the context of modern India and global capitalism to see how his ideals can still be used today.

## **DON'T FORGET THE FRUIT! CONGRUENT AND DISCREPANT CATEGORICAL PRIMING EFFECTS ON PROSPECTIVE MEMORY**

Presenter: Crum, Jordan  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Dawn McBride  
Author(s): Jordan Crum

Prospective memory (PM) is utilized in everyday life that enables remembering to perform an action or an intention. Real world applications include important implications in the medical field such as remembering a daily medication regimen or simple daily memory tasks. In two experiments, participants were asked to complete lexical decision tasks including a prospective memory task to respond to particular PM target words from either the Fruits or Body Parts categories. In addition, words in the lexical decision task came from the same or different category than the PM cues. The purpose of the study is to test whether discrepancy or congruency between PM cues and the background task affects prospective memory. A previous study (Thomas & McBride, 2013) found that congruency aids in PM performance. The current study attempted to generalize those findings to a new task.

## **INTERACTION PATTERNS IN AN ONLINE MUSIC REMIX COMMUNITY**

Presenter: Duxler, Rebecca  
Mentor Department: Information Technology  
Faculty Mentor(s): Prof. Elahe Javadi  
Author(s): Rebecca Duxler, Elahe Javadi

Information Technology and music, two of life's joys, come together in this wonderful display. The goal of this research is to examine how people from all over the world interact in an online music remix community. A modestly designed website, ccmixer.org is a platform for music lovers to share their music samples and remix other user's songs; all of the music is licensed under Creative Commons and available for the public. Active users on the website create and post music, review, rate, and recommend others' works. Most importantly, users create remixes based on their peers' works. In this research, we aim to understand how ccmixer users socially interact using tools provided by the website. We focus on review and remix relationships, as well as the interface features, which facilitate these activities. Our methodology is a combination of surveys and analytical investigation of the ccmixer.org social network.

## **SEXUAL CONTENT IN SPANISH-LANGUAGE TELEVISION**

Presenter: Estela, Yesenia  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Rocio Rivadeneyra  
Author(s): Yesenia Estela, Rocio Rivadeneyra

Sexual content is regularly portrayed in the media and in many different languages. Currently there is a history of previous content analysis of sex in English-language media, however there have not been any analyses that have been conducted on sexual content in Spanish-language media. It is important to analyze how sexual content is portrayed in Spanish-language television because television programs tend to reflect the culture in which they are produced and media portrayals tend to shape society's understandings of different cultures, such as stereotypes of how sex and sexuality is portrayed within the Latino community. The purpose of this study is to analyze how sexual content is portrayed in Spanish-language television, specifically telenovelas (Spanish soap operas). Telenovelas were selected for this study because they make up the majority of Spanish-language network television. Our team will view and code a week's worth (five days, Monday through Friday) of seven different telenovelas (a total of 35 episodes) that air daily on the popular Spanish-language network Univision. The programs will be coded by bicultural and Spanish-English bilingual Latina students. Our team will establish a code book with themes including sexual behaviors and talk that are seen in Spanish-language, we will code the type and frequencies that sexual content is seen within two-minute intervals of each telenovela. Some themes that we will be looking for include what type of sexual behavior occurred between characters, whether it is physical flirting, passionate kissing, intimate touching, and/or sexual intercourse. We will code how explicit the sexual behavior was as well as the relationship between characters involved in the sexual behavior. We will train as a group to identify themes and codes and then code independently once we have established inter-rater reliability.

## **BEHAVIORAL ENGAGEMENT, SECOND STEP INTERVENTION EXPOSURE, AND KINDERGARTNERS' KNOWLEDGE GAINS**

Presenter: Freund, Danielle  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Renée Tobin  
Author(s): Nicole Moore, Alyssa Sondalle, Mychole Willis, Katelyn Probst, Danielle Freund, Thomas Mulderink, Renee Tobin

This study examines the social-emotional development of kindergartners in the context of the receipt of a primary prevention program, Second Step: A Violence Prevention Curriculum (Committee for Children, 2002). This program targets the development of emotion identification, empathy, problem solving, and self-regulation skills. The Second Step intervention was administered to children in local kindergarten classrooms randomly assigned to receive the standard curriculum (168 children in 13 classrooms) or a booster condition (152 students in 12 classrooms). All students received 25 weekly Second Step lessons. Children in the booster condition received an extra lesson each week that provided the opportunity to review and practice the skills learned in each of the weekly lessons. Research assistants collected engagement data during lessons and interviewed each student pre- and post-intervention using the Second Step Interview Evaluation Instrument (Committee for Children, 2002) to measure knowledge of Second Step content areas pre- and post-intervention. Two individual researchers who coded interview responses produced knowledge scores for each child, which served as the outcome measure. A cross-product regression analysis was used to examine these relations. Results will be discussed in terms of engagement and social-emotional development.

## **HOW PROPHYLACTIC ANKLE SUPPORTS AFFECT ANKLE ROM AND ISOKINETIC TORQUE, WORK, AND POWER**

Presenter: Garrell, Jamie  
Mentor Department: Kinesiology and Recreation  
Faculty Mentor(s): Profs. Michael Torry and Steve McCaw  
Author(s): Jamie Garrell, Michael Torry, Jacque Jones, Michael J. Decker, Steve McCaw, Kelly Laurson

**PURPOSE:** Prophylactic ankle supports are applied to decrease probability of an ankle injury. A common criticism of these supports is that they may possibly decrease the range of motion (ROM) and plantarflexion-dorsiflexion strength thereby hindering performance. The purpose of this study was to compare isokinetic ankle joint strength (plantarflexion and dorsiflexion torques), total work, and ROM values between two different types of ankle joint protective devices: a) Active Ankle (AA), b) ProTaco (PT) against a no support-control condition. **METHODS:** The subjects were 22 female volunteers (mean age:  $20.5 \pm 3.7$  yrs). The Biodex isokinetic dynamometer system was utilized to measure peak ankle plantarflexion and dorsiflexion isokinetic torque/body weight, total work/body weight, and ROM at  $60^\circ/\text{second}$ . Separate RMANOVA with Bonferroni post hoc analyses was applied to each variable to detect differences between conditions ( $\alpha = 0.05$ ). **RESULTS:** Both ankle supports caused a decrease in ROM compared to control (both  $p < .001$ ); and, the AA produced a greater reduction in ROM compared to PT ( $p < .004$ ). There was an average 15% decrease in peak plantarflexor torque/BW due to the supports but these reductions were not significant ( $p = .69$ ). There were no differences in peak dorsiflexor torque/BW ( $p = .39$ ), dorsiflexor work/BW ( $p = .09$ ) or average power ( $p = .64$ ) between conditions. **CONCLUSIONS:** The results of this study suggest that ankle joint prophylactic guards do limit ROM but have little effect on peak plantarflexor or dorsiflexor peak torque, work or power.

## **APPAREL COMPANIES' EFFORTS TO ELIMINATE UNETHICAL LABOR PRACTICES FROM THEIR SUPPLY CHAINS**

Presenter: Goerlitz, Kylie  
Mentor Department: Family and Consumer Sciences  
Faculty Mentor(s): Prof. Yoon Jin Ma  
Author(s): Kylie Goerlitz

This research looks at the efforts of apparel companies to increase the transparency of their supply chains in manufacturing apparel products. The apparel industry is a massive and widespread industry. Most of the manufacturing and production take place in low-income countries on the other side of the globe and involve unethical labor practices. These include payment of a non-living wage, child labor, poor work environments, human trafficking, and slavery. Many U.S. based companies source from these manufacturers either knowingly or

unknowingly.

California recently took measures to try and eliminate this issue. The California Supply Chain Transparency Act of 2010 put into effect on January 1, 2012 requires California based companies who annual gross \$100 million or more to make public what actions they take in order to eliminate these unethical labor practices from their supply chain and the extent to which they are implemented. This holds these companies accountable for knowing who makes their products. They post this information on their website for everyone to view. Different companies post varying levels of information, some writing a paragraph and others several pages. The ease of access of this information also varies. This research will reveal how apparel companies report this information, including the level of information and the method and ease of access.

### **SUPPRESSION OF VISIBILITY: A RHETORICAL ANALYSIS OF MOSCOW'S BAN ON GAY PRIDE PARADES**

Presenter: Hlavaty, Joseph  
Mentor Department: Communication  
Faculty Mentor(s): Profs. Megan Koch and Jon Carter  
Author(s): Joseph Hlavaty

Gay pride parades take place annually all around the world, where members of the LGBT community can come together and express their pride in who they are, as well as their continuous acceptance in modern day society. However, in Moscow, this community may have to wait a while before they can march the streets again...100 years to be exact. Moscow city and district courts have postponed the next pride parade until May of 2112. The American non-profit organization Human Rights First has condemned the law, labeling the Russian government as behind the times. But bearing in mind that the city government has already banned this parade each of the past seven years, this extended ban represents more than narrow-mindedness, but rather an effort to draw attention to and redefine the LGBT community in Russia. This is reminiscent of the communicative concept "visibility". Philosopher Michel Foucault notes that as social institutions draw attention to a group of people, this visibility also serves to re-establish the social roles and standing of that group. Thus, as the Moscow ban can grant insight into the rhetorical relationship between governments and the co-cultures they try to control, we must ask the research question: How does the suppression of visibility through a ban alter activist movements? To answer this question, we will turn to Bradford Vivian's Spring 1999 article in the Western Journal of Communication called, "The Veil and the Visible." Because Vivian sets up how restrictions on actions, in this case a French prohibition on hijabs, alters visibility, it is ideal to use in the case of the Moscow pride parades. This paper will examine Vivian's model, apply it to the Moscow ban, before finally drawing some critical implications.

### **THE EFFECT OF TWO COOLING MODALITIES ON SKIN AND TENDON TEMPERATURE**

Presenter: Hogan, Kathleen  
Mentor Department: Kinesiology and Recreation  
Faculty Mentor(s): Prof. Noelle Selkow  
Author(s): Kathleen Hogan, Noelle Selkow, Jeremy Hawkins

Context: Cold air therapy has become a recent trend in the athletic population to recovery from injury. The skin is exposed to very cold temperatures, which is hypothesized to bring new blood to the injured area. However, its effectiveness has not been compared to other cooling modalities. Objective: To measure skin and Achilles tendon temperature change following 2 cooling modalities. Setting: Laboratory. Patients and other participant(s): Fourteen healthy participants volunteered between the ages of 18-30. Intervention(s): A thermometer was placed .5 cm into the Achilles tendon using sterile techniques. Subjects had an ice bag or cold air placed over the area. The ice bag was applied for 20 minutes and cold air was applied for 2 ½ minutes. The subject returned at least a week later to receive the opposite treatment. Main Outcome Measures: Skin and muscle temperature measurements were collected at baseline, immediately after treatment, 10, 20, and 30 minutes post treatment. Expected Results: We hypothesize that the cold air condition will have lower skin and tendon temperature post-treatment compared to the ice bag condition, but this will be the only significant difference between conditions. Conclusion: If our hypotheses prove to be true, we would recommend the option of using cold air therapy during rehabilitation of an injury.



## **PERCEPTION OF STAND-ON-ABILITY BY MEANS OF A WIELDED OBJECT EXHIBITS ANATOMICAL INDEPENDENCE**

Presenter: Jackson, Daniel  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Jeffrey Wagman  
Author(s): Dan Jackson, Jeffrey Wagman

Successfully performing a given behavior requires perceiving whether that behavior is possible. Such possibilities for behavior are known as affordances. In the most familiar case, affordances are perceived by vision. However, affordances can be perceived by means of many different perceptual systems. Affordances can even be perceived by means of a surface with a hand-held object. In this series of experiments, blindfolded participants used a long wooden rod to explore a wooden surface at different angles of inclination. They reported whether they would be able to stand on that surface and how confident they were in their report. Experiment 1 found that there was no difference between performance, confidence, or response latency when the participant held the rod in their preferred and non-preferred hands. Experiment 2 found this same pattern of results when participants held the rod in with one and with two hands. Finally, Experiment 3 found the same pattern of results when participants held the rod with different grip styles. The results suggest that perception of affordances by means of a hand-held object may be independent of hand, number of hands, or grasp configuration.

## **THE USE OF ACYL SUCCINIMIDES IN THE ONE POT SYNTHESIS OF A DERIVATIVE OF DENOPAMINE**

Presenter: Janci, Elise  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Shawn Hitchcock  
Author(s): Elise Janci, Shawn Hitchcock

*Acyl succinimides* were prepared in the 1960s and were initially used for the acylation of amino acid residues. We have developed these compounds for an expanded purpose of developing one pot reactions. *Acyl succinimides* readily couple with amines without the need for catalysts such as dimethylaminopyridine and the only byproduct is the water soluble succinimide. We have employed succinimide in a one pot synthesis of the anti-arrhythmia agent denopamine by coupling together a coupling reaction and a Dibal-H reduction. This presentation will highlight our work with the acyl succinimides.

## **DIFFERENCES IN INITIATION, CONTINUATION AND CESSATION OF PLAY BOUTS BETWEEN DEAF AND HEARING DOGS (CANIS FAMILIARIS).**

Presenter: Johnson, Jacquelyn  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Valeri Farmer-Dougan  
Author(s): Jacquelyn Johnson, Valeri Farmer-Dougan

Domesticated pet dogs, obviously, are highly social creatures. Dogs are able to attend to and understand a variety of both human and other dog behaviors. However, a recent debate is whether these socialization behaviors developed as part of the complex socialization period, or are relatively inflexible, and perhaps innate. Using deaf versus hearing dogs, we are able to examine two groups with highly different socialization experiences. Deaf dogs, unlike hearing dogs, are unable to benefit from early experience regarding vocalized socialization skills, but otherwise appear to develop relatively normally. How deaf dogs compensate for the loss of vocalized cues during social interactions then provides a basis for understanding innate versus learned socialization patterns. The present project examines whether deaf dogs show significantly different and potentially poorer play interactions during both deaf-deaf and deaf-hearing play dyads. We predict that deaf dogs will use increased physical contact and behavioral movements to initiate play, and will show ineffective vocalizations when initiating play. Further, deaf dogs should not respond to verbal signals by typical dogs to end play or to alter the flow of play. Deaf dogs together will engage in rougher play than typical-typical or deaf-typical dyads because during deaf-deaf dyads neither is able to exhibit social behaviors that signal the end of a play bout.

## **TEACHER RATINGS OF ENGAGEMENT AND SECOND STEP EDITION AS A PREDICTORS OF SOCIAL-EMOTIONAL KNOWLEDGE**

Presenter: Kestian, Jade  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Renée Tobin  
Author(s): Jade Kestian, Alyssa Sondalle, Katelyn Probst

In recent years, school personnel have been charged with providing social-Emotional curricula to target children's social and emotional development explicitly. One social-emotional program that has been adopted by local schools is the empirically supported primary prevention program, Second Step: A Violence Prevention Curriculum (Committee for Children, 2002). This curriculum teaches emotion identification, empathy, emotion management, and problem solving. Student engagement has been shown to be a predictor of academic achievement; however, less is known about engagement as a predictor of social-emotional knowledge. The present study examines engagement as a predictor of social-emotional knowledge in kindergartners exposed to the Second Step curriculum. A total of 300 participants (150 girls and 150 boys) in 26 kindergarten classrooms received weekly Second Step Lessons for 25 weeks. All kindergartners received lessons from either the third or fourth edition of the Second Step curriculum. Second Step edition was randomly assigned by classroom (13 classrooms to each edition). To assess social-emotional knowledge, child participants were interviewed individually by researchers both pre- and post-intervention using the Second Step Interview Evaluation Instrument (Committee for Children, 2002). Teachers rated student engagement using the 16-item Teacher Rating Scale of School Adjustment (TRSSA; Betts & Rotenberg, 2007). Analyses will focus on examining the relations among Second Step edition, teacher ratings of student engagement, and children's social-emotional knowledge.

## **TEMPERAMENT IN MIDDLE CHILDHOOD**

Presenter: Lacey, Heather  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Alycia Hund  
Author(s): Heather Lacey

Temperament is defined as constitutionally based individual differences in emotional, motor, and attentional reactivity and self-regulation. Inhibitory control, the ability suppress a dominant response with a subdominant response, is one important dimension of temperament. Much has been discovered about temperament in recent years, such as temperament is easily observable in infancy and is fairly stable over time yet does develop with age (Schmitz, Saudino, Plomin, Fulkner, & DeFries, 1996). Temperament is particularly important when trying to understand the behaviors of children. Most of what we know about temperament comes from studies that focus on infancy and early childhood (e.g., Komsu, Räikkönen, Heinonen, Pesonen, Keski-Vaara, Järvenpää, 2008). Only one published study has focused on temperament in middle childhood through the development of a new measurement scale called the Temperament in Middle Childhood Questionnaire (TMCQ; Simonds, Kieras, Rueda, & Rothbart, 2007). Given the dearth of knowledge, the overall goal of this study was to gain a better understanding of temperament during middle childhood. The present study included a version of the Stroop Task to measure inhibition and the TMCQ that was developed by Simonds et al. (2007). Specifically, this project sought to link the TMCQ inhibitory control scale with inhibition demonstrated through performance on a Stroop Task, to better understand the longitudinal development of temperament from early childhood to middle childhood, and to further establish the psychometric properties of the TMCQ. Ninety-three children, forty-eight girls and forty-five boys between the ages of six and ten years, completed a color word Stroop Task. Mothers completed the parent-report version of the TMCQ. A subset of parents had completed a related temperament measure (i.e., the Child Behavior Questionnaire, (CBQ; Rothbart, Ahadi, Hershey, & Fisher, 2001) four years earlier. As expected, Pearson correlations revealed a significant positive relation between observed and reported inhibition, confirming that there was a relation between the two measures of inhibition. Pearson correlations between all twelve common dimensions of the TMCQ and the CBQ also were significant, offering a unique view of the developmental bridge between temperament in early childhood and middle childhood. As expected, Cronbach's alphas confirmed the internal consistency of all seventeen subscales of the TMCQ, further establishing the psychometric properties of the TMCQ. Together, these findings provide useful information about temperament during middle childhood, setting the stage for future research and practice.

## **SYNTHESIS AND EXAMINATION OF SULFONAMIDES USING X-RAY CRYSTALLOGRAPHY**

Presenter: Lawton, Zachary  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Christopher Hamaker  
Author(s): Zachary Lawton, Christopher Hamaker

The interactions of pharmaceuticals in the solid state can be important for their function. To study the interactions of sulfonamides in the solid state, a series of N-(4'-acetyaminophenylsulfonyl)-4-bromoaniline)sulfonamides have been prepared and characterized by spectroscopic techniques, including NMR and X-ray crystallography. We have compared the structural differences of the compounds with different para-substituents of the aniline group to gain insight into the interactions of this important class of molecules.

## **STUDIES DIRECTED TOWARDS THE SYNTHESIS OF DIDEAZAPORPHYRINS**

Presenter: Laxner, Jonathan  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Timothy Lash  
Author(s): Jonathan Laxner, Timothy Lash

The aromatic characteristics of porphyrins are often attributed to the presence of an 18pi electron delocalization pathway. Recently, a dideazaporphyrin was reported that retained porphyrin-like properties but no longer possessed two of the pyrrolic subunits. In order to further investigate this system, new examples of dideazaporphyrins have been targeted for synthesis. Pyrrolic intermediates have been prepared using the Barton-Zard reaction and converted into the related bis(acrylaldehydes). It is anticipated that McMurry coupling will afford the desired dideazaporphyrins.

## **PIEZOELECTICITY AS A FUNCTION OF PRESSURE**

Presenter: Legner, Christopher  
Mentor Department: Physics  
Faculty Mentor(s): Prof. David Marx  
Author(s): Christopher Legner, David Reisinger

The piezoelectric effect is a property of some crystals and ceramics that allows for a mechanical stress to be converted into a voltage. Potassium sodium tartrate (Rochelle salt) is one such piezoelectric crystal that can be grown from a simple reaction between sodium carbonate and potassium tartrate in de-ionized water. Such crystals are the subjects of study and the relationship between their voltage output and the pressure applied, as a mechanical stress, is the primary subject of study.

## **STICKS AND STONES VS. WORDS: EXAMINING THE POSSIBILITY THAT THEY ARE ONE IN THE SAME**

Presenter: Lyons, Gentry  
Mentor Department: Politics and Government  
Faculty Mentor(s): Prof. Erik Rankin  
Author(s): Gentry Lyons

This work seeks to analyze the legal and cultural issues surrounding the protection of hate speech in the United States, specifically examining how the eliminationist rhetoric that is often used in the media today allows for the transmission of extremist viewpoints into mainstream ideology. By first defining and looking into the various forms that hate speech can take on, we are better able to recognize its usage in everyday settings. Each of these forms, independently and as a whole, serve a purpose when employed in one's communication and often have the power to create a chilling effect on individuals and their society. Multiple theories on the transmission and psychological impact of hate speech are examined. This analysis allows us to investigate the contexts in which these messages are likely to occur, as well as where they are likely to originate and find support.

A review of the current literature suggests possible sociological and psychological influences that may moderate an individual's attitudes and reactions towards hate speech. An understanding of the impact that this rhetoric has on society is crucial if our legislators and citizens are to make informed decisions regarding the continued protection of those who promote hate and violence against others. An investigation of how eliminationist messages influence

violent acts demonstrates a relationship between the power of speech and the decision to cause harm. Furthermore, we are able to see how the political and legal environments of the United States have shifted their position on the issue back and forth over the years.

## **THE IMPACT OF PHONEMIC SCAFFOLDING ON PRINT AWARENESS**

Presenter: Lyons, Gentry  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Gregory Braswell  
Author(s): Gentry Lyons, Gregory Braswell

In this study, I will utilize data collected from 9 preschool children to investigate how a teacher's level of phonemic scaffolding may be associated with a child's level of print awareness. As print awareness and phonemic awareness are both emergent literacy skills that begin to develop during the preschool years, I chose to examine how instruction in one area may relate to a child's competency and development in another. Over an 8-week period at a local preschool, a teacher was videotaped interacting with the students during various literacy activities. These tapes were then coded to assess the level of scaffolding that the teacher employed when working with each child.

In order to measure the children's print awareness skill and development, pre- and post-tests were administered. The assessments used in this study included the Preschool Word and Print Awareness (PWPA) and an instrument to test letter knowledge. These outcome measures will allow us to determine how an increase in the child's print awareness correlates with the teacher's use of scaffolding. It is hypothesized that as a child's skill in print awareness increases the teacher will utilize lower levels of scaffolding. A better understanding of the interaction between these two emergent literacy skills can be applied to teaching strategies in preschools in order to foster more developed reading and writing skills before kindergarten.

## **MALARIA AND ITS DIAGNOSIS**

Presenter: Marshall, Kevin  
Mentor Department: Health Sciences  
Faculty Mentor(s): Prof. Meridee Van Draska  
Author(s): Kevin Marshall

Malaria is a parasitic disease caused by organisms of the genus Plasmodium. Although many species are present in the genus, only four are considered pathogenic to humans. It is transmitted to humans through mosquitoes, specifically the genus Anopheles. Malaria is endemic to much of Africa, southern Asia, and parts of South America. Microscopic identification of the organism is the most common way to diagnose the disease in the United States. The uses of molecular techniques such as PCR are very helpful in classifying the species of Plasmodium causing. Other diagnostic techniques will also be discussed. Treatment varies depending on the species, severity, and the geographic region the disease was obtained.

## **THE EFFECT OF CROSS-TURBULENCE ON COUNTER-ROTATING VERTICAL-AXIS WIND TURBINES**

Presenter: Massey, Jasen  
Mentor Department: Physics  
Faculty Mentor(s): Profs. David Marx and George Rutherford  
Author(s): Jasen Massey, William Heidorn, David Marx

When wind turbines rotate, cross-turbulence is the byproduct. The cross-turbulence, or wake, results in a non-uniform flow of the air as it reaches the next sequential turbine. If vertical-axis wind turbines (VAWTs) are arranged in an array with symmetrical rotation, the resulting wake will be in the opposite direction of the rotation of the neighboring turbine, which results in negative interactions. By having an array of counter-rotating VAWTs, the cross-turbulence produced will flow synchronously with the rotation of the subsequent turbine. We examined the effect cross-turbulence had on the power output for counter-rotating VAWTs with relation to symmetrically rotating VAWTs. The savonius wind turbine design was utilized in the examination of the effect of cross-turbulence on counter-rotation orientations of VAWTs. Results showed when the orientations were opposite, there was a negligible drop in efficiency compared to independent turbines; and an order of magnitude drop in efficiency when the orientations are symmetrical. These observations will hopefully provide a better understanding about the orientation and spacing of the turbines.

## **METAL ION CONCENTRATION IN LOCAL WATERSHEDS, BLOOMINGTON ILLINOIS**

Presenter: Meinzer, Evan  
Mentor Department: Geography-Geology  
Faculty Mentor(s): Prof. Catherine O'Reilly  
Author(s): Evan Meinzer, Laura Hanna, Laura Sugano, Catherine O'Reilly, Richard Twait

Water resources in the Midwest, like all places, are vital to sustain a growing and thriving region. In a region where larger cities use surface water for drinking and industry, pollutants and particulates can have dramatic effects on a population and the ecology. While these pollutants may take many forms, the focus of this project was the metallic compounds and elements which enter water supplies. This study was aimed to research the concentration of metal ions in major tributaries supplying local drinking water to Bloomington, namely Money Creek to the Northeast (supplying Lake Bloomington) and Six Mile Creek to the North (supplying Lake Evergreen). Samples from the two streams are acidified to prevent coagulation and bonding, and run through an atomic absorption spectrometer to determine the types and concentrations of specific metals which are present. Samples have been taken during a variety of times, day and night, and various weather events, to obtain a more broad understanding of the stream dynamics.

## **CANCER-RELATED GENE AND REPETITIVE STRUCTURE-FORMING G-RICH SEQUENCES WITHIN THE HUMAN GENOME**

Presenter: Micensky, Morgan  
Mentor Department: Biological Sciences  
Faculty Mentor(s): Prof. Erik Larson  
Author(s): Morgan Micensky

The human genome is highly repetitive, with regions that are capable of forming non-duplex DNA structures that are connected with disease. In particular, DNA sequences that contain tandem repeats of guanine can adopt four-stranded structures known as G4 DNA. G4 DNA leads to genetic instability and cancer, but the mechanisms are not well defined. We have taken a bioinformatic approach to better understand the connection between sequence motifs capable of adopting G4 DNA and genes associated with cancer. This is important because DNA alterations at cancer-associated genes leads to oncogenesis. We hypothesized that extensively G-rich DNA sequences in the human genome will be concentrated at cancer-associated genes, explaining why these particular regions of the genome are prone to instability. We have found multiple repetitive G-rich sequences in the human genome, and characterized the nearby genes. Correlating these repeats with gene type and with genome instability measures will clarify the mechanisms leading to gene rearrangements connected with disease.

## **EFFECTS OF SLOW SPEECH ON SPEECH AND LANGUAGE IN STUTTERING**

Presenter: Moloney, Kathleen  
Mentor Department: Communication Sciences and Disorders  
Faculty Mentor(s): Prof. Heidi Harbers  
Author(s): Kathleen Moloney

Studies on slow speech intervention have shown that decreasing speech rates of parents or caregivers has had a positive effect on increasing the fluency of children who stutter. Research shows that stuttering has decreased after their mothers had been taught to slow their speech rate. Fewer studies, however, have been done to find the effects of this intervention on the language output. This study assesses both the effects of slow speech on children's disfluencies, as well as changes in language due to reduced speech rate. The participants of this study included 10 children who stutter, ages 44 to 66 months, and their caregivers. Conversation samples between the children and their caregivers were collected to gather baseline data, and then again after the caregiver received intervention on using slow speech when communicating with their child. Analysis of speech rate and fluency revealed that the caregivers were able to slow down their speech and that the reduction of speech rate of the parent resulted in more fluent speech by the child.

The focus of this presentation will be to report on the changes in language as a result of slow speech intervention. We hoped to find the relationship between a reduced caregiver speech rate and a variety of language measures (e.g., discourse, semantic, and morphosyntactic measures). To find these relationships, all transcripts were coded using the Systematic Analysis of Language Transcripts (SALT) program. This allowed us to find results of language

analyses both before and after slow speech intervention, which will be illustrated on this poster.

### **ACCEPTABILITY OF TWO DAIRY-FREE CHOCOLATE PUDDINGS USING CASHEW CREAM AND RICE MILK**

Presenter: Moss, Caroline  
Mentor Department: Family and Consumer Sciences  
Faculty Mentor(s): Prof. Julie Schumacher  
Author(s): Caroline Moss, Tejaswini Mirji, Molly Bragg, Brady Jiter

This paper aims to study the acceptability of two-dairy free chocolate puddings against the control using cashew cream and rice milk. The Control used cow's milk, Variation 1 used a 100% cashew cream substitution, and Variation 2 used a 1:1 ratio of cashew cream and rice milk. The first research question was to test if there was a statistically significant difference in the desired sensory properties of mouthfeel, flavor, and overall acceptability for chocolate pudding made with Variation 1, Variation or the Control. The second research question asked if there was a statistically significant difference in the desired objective variables of gumminess and cohesiveness for chocolate pudding made with Variation 1, Variation 2, or the Control. The cashew cream was prepared by soaking cashews in water overnight and grinding them to a smooth paste using the same water in a food processor. Variation 2 was prepared by first mixing two cups of cashew cream to two cups rice milk before cooking the pudding. All three puddings were made on a conventional stove top and were cooled overnight prior to sampling. Based on the sensory results of 30 participants, both variations had an acceptable flavor but Variation 2 had a higher score for mouthfeel. The objective results were tested on only three pudding samples and showed considerable differences in the gumminess of both variations and resulted in Variation 2 being more acceptable than Variation 1. Although the flavor for Variation 1 was acceptable, it had higher scores on gumminess (very dense, thick consistency). Based on the findings of the current study, it was determined that Variation 2 which used rice milk and cashew cream in a 1:1 ratio to substitute cow's milk were acceptable modifications for the whole milk in the dairy-free chocolate pudding. These puddings can be used as a potential dairy-free, high-calorie food item in clinical settings. Modifications to the amount of ingredients used in Variation 1 could improve the mouthfeel and gumminess and thus produce a more acceptable milk-free product. The results of this study may be useful to future researchers who are interested in creating dairy-free pudding alternatives.

### **ASYMMETRIC SYNTHESIS: STUDYING THE POTENTIAL OF LIGANDS AND CHIRAL AUXILIARIES IN MEDICAL SYNTHESIS**

Presenter: Nelson, Brandon  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Shawn Hitchcock  
Author(s): Brandon Nelson, Shawn Hitchcock

The synthesis of medicinal agents often invokes the asymmetric nature of molecules and the need to develop synthetic routes that maintain the chiral nature of a molecule as complexity is added. The two molecules under investigation are Tamiflu, used to combat avian bird flu, and Saquinavir, an HIV protease inhibitor. In order to decrease cost and increase speed and efficiency of the synthesis of Tamiflu, monophosphines were synthesized using an ephedrine backbone and used as catalysts in the Tsuji-Trost Asymmetric Allylic alkylation and enantiomeric ratios were measured. We have shown that monophosphines possess equal potential as ligands and maintain equal enantiomeric ratios. The synthesis of two chiral auxiliaries, oxazolidinones and oxadiazinones, were investigated for their use as suitable auxiliaries in the aldol reaction leading to the synthesis of Saquinavir.

### **ABSORBING-LIKE BOUNDARIES FOR QUANTUM FIELD THEORETICAL GRID SIMULATIONS**

Presenter: Norris, Samantha  
Mentor Department: Physics  
Faculty Mentor(s): Profs. Charles Su and Rainer Grobe  
Author(s): Samantha Norris, Andrew Vikartofsky, Robert Wagner, Q. Charles Su, Rainer Grobe

We introduce a computational method [1] that permits us to increase the interaction time for quantum and quantum field theoretical simulations of multi-particle states on a finite space-time grid. In contrast to the usual approach where the unwanted wave function close to the grid boundaries is absorbed by a potential with a negative imaginary part, this method is unitary and therefore conserves the norm of the state. This technique is based on assigning

particles close to the boundary a larger effective mass (or slower speed of light), such that these particles slow down and cannot re-enter the interaction zone. The method can therefore be applied to multi-particle states.

### **ANALYSIS OF COMMONLY ABUSED PHARMACEUTICALS USING A PORTABLE MASS SPECTROMETER**

Presenter: O'Leary, Adam  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Christopher Mulligan  
Author(s): Adam O'Leary, Kyle Vircks, Christopher Mulligan

In today's society, the variety and amount of evidence at crime scenes has become very widespread. Although many noteworthy analytical methods and techniques have been established over the years, increases in crime rates has led to forensic laboratories not being able to keep up with the influx, resulting in large amounts of backlogged evidence. This has created the need for a more rapid and on-site form of forensic technology that would significantly reduce this inflow of backlogged evidence.

This research focuses on the implementation of a broadly-applicable and portable form of chemical detection based on a mass spectrometer capable of "ambient" detection. This technology would allow the direct detection of a variety of target analytes, specifically abused pharmaceuticals, in their natural state and environment without prior sample preparation. Equally important, physical analyses could be performed on-site at crime scenes thereby reducing the amount of evidence being sent to forensic science practitioners and associated laboratories.

### **PREVIOUS HOOK-UP EXPERIENCE AND SEXUAL BEHAVIORS IN ROMANTIC RELATIONSHIP DEVELOPMENT**

Presenter: Park, Ashley  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Marla Reese-Weber  
Author(s): Ashley Park

The purpose of this study is to examine the difference between when sexual behaviors first occur in romantic relationships for people who have had previous hook-up experiences compared to those who have not. The participants in this study were undergraduate students at Illinois State University who were given extra course credit for their participation. Participants were asked to complete a demographic questionnaire which asked about their past and current relationships. Specifically, participants were asked if they ever had a hookup with someone. Participants also completed a questionnaire regarding when romantic milestones first occurred in their current romantic relationship (e.g., saying I love you, sexual intercourse). The results expect to find that participants who report having had a previous hook-up experience will also report having engaged in sexual behaviors earlier in their current romantic relationships than participants who report not having had a previous hook-up experience. The implications of this study will be further discussed.

### **SURVEY OF ASSESSMENT TOOLS USED IN ILLINOIS EARLY CHILDHOOD EDUCATION PROGRAMS**

Presenter: Patnaude, Melissa  
Mentor Department: Special Education  
Faculty Mentor(s): Prof. Sharon Doubet  
Author(s): Sharon Doubet, Melissa Patnaude

The purpose of this research is to determine what early childhood assessment tools are being used in early education programs in the State of Illinois. Based on the literature which calls for an ongoing improvement of assessment methods (Wortham, 2005), and the significance the role assessment plays in determining eligibility for special education services (Bricker, et al., 2008), there is a need to determine what assessment tools are currently being used. An online survey was used in order to learn what assessment tools are used in early education programs in Illinois. The online survey was sent out to the public Early Education schools in Illinois. These schools included the Early Childhood Special Education and Preschool for All programs. Teachers and program coordinators sent back the survey and results will be shared at the symposium. The main questions that were asked during this survey were 1.) What assessment tools are currently being



used for Child Find screening purposes? 2.) What assessment tools are currently being used to determine eligibility? and 3.) What assessment tools are currently being used for curriculum, progress monitoring or program planning? Data will be aggregated and used to drive instruction in early childhood assessment courses offered in institutions of higher education.

#### **A REVIEW: LISTENING EFFORT AND COGNITIVE LOAD IN MILD-SEVERE HIGH FREQUENCY HEARING LOSS.**

Presenter: Pearson, Rebecca  
Mentor Department: Communication Sciences and Disorders  
Faculty Mentor(s): Profs. Jennine Harvey and Rene McClure  
Author(s): Rebecca Pearson

Hearing is only the initial component in understanding verbal communication. Cognition also plays a role in processing auditory information. The ability to hear refers to the capacity to perceive and transform acoustic signals that come from the environment and deliver them to the brain. After the acoustic signals are captured and sent to the brain, however, cognitive processing is necessary to filter, examine, and analyze the signal from the external environment (Healthy Hearing, 2007). Just as the abilities of hearing and cognition work together, so do audiologists and speech-language pathologists when they collaborate their efforts to facilitate evaluations and remediation services with the adult population. This partnership of professions begins at the level of research. For speech-language pathologists and audiologists to develop the most beneficial therapy techniques for adult clients with hearing loss, they rely on consulting the research and data in both the areas of cognition and hearing. The purpose of this project is to investigate literature that 1) examines listening effort and cognitive load in mild and severe high frequency hearing loss, and 2) studies how this research can be incorporated into therapy with clients. A systematic literature search will be conducted in the following areas: listening effort in noise, cognitive load in dual task, and listening effort and cognitive load in populations with mid-severe high frequency hearing loss. All articles and research found will be added to a digital database of articles for the use of speech pathology and audiology students. At the conclusion of this project, I will have compiled and reviewed literature in preparation for assessment and treatment of clients with issues of hearing and cognitive loss.

#### **DOES GENDER AND RACE/ETHNICITY MATCHING MAKE A MENTORING RELATIONSHIP MORE EFFECTIVE?**

Presenter: Perez, Kailey  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Eros DeSouza  
Author(s): Kailey Perez, Eros DeSouza

Mentoring is an effective tool for organizations to help the success of protégés and it also can help fulfill the needs of mentors. An effective mentorship is difficult to achieve and can become dysfunctional or abusive if proper care is not taken. Therefore, this study addresses the question; does gender and race/ethnicity matching make a mentoring relationship more effective? Since most individuals have an affinity towards others who are similar to them, I hypothesize that protégés and mentors in a mentoring dyad will also prefer to be matched with those who are similar to them but there will be no significant difference in the outcomes of the mentoring relationship. This study examines mentorships that take place in the fields of science, technology, engineering, and mathematics (STEM). Faculty members and graduate students at Illinois State University in the departments of Biology, Chemistry, Technology, and Mathematics will be contacted initially surveying if they have been a part of a mentoring relationship within the past two years. Those who respond affirmatively will be invited to participate in a confidential interview. The responses gathered through the interview process will further be evaluated through the process of content analysis to identify a theory explaining the collected data.

#### **CHARACTERIZATION OF THE PRODUCT OF $[\text{Re}_6\text{Se}_8(\text{PEt}_3)_5(\text{NCPh})](\text{BF}_4)_2$ and KOH**

Presenter: Quilty, Calvin  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Lisa Szczepura  
Author(s): Calvin D. Quilty, Stanley A. Knott, Lisa F. Szczepura

The reactivity of benzonitrile as a ligand of  $[\text{Re}_6\text{Se}_8(\text{PEt}_3)_5(\text{NCPh})](\text{BF}_4)_2$  was tested.  $[\text{Re}_6\text{Se}_8(\text{PEt}_3)_5\text{I}]$  was exposed to  $\text{AgBF}_4$  and benzonitrile to produce the  $[\text{Re}_6\text{Se}_8(\text{PEt}_3)_5(\text{NCPh})](\text{BF}_4)_2$ . Previously this had been reacted with roughly twenty equivalents of KOH yielding  $[\text{Re}_6\text{Se}_8(\text{PEt}_3)_5(\text{C}_7\text{H}_6\text{NO})](\text{BF}_4)$ , where the benzonitrile has been converted to a carboxamide. This time the  $[\text{Re}_6\text{Se}_8(\text{PEt}_3)_5(\text{NCPh})](\text{BF}_4)_2$  was reacted with five equivalents of KOH. The product appeared significantly different on the  $^{31}\text{P}$  NMR spectrum from the previously synthesized complex. The complex was characterized by IR and UV-

vis spectroscopy, mass spectrometry, combustion analysis, as well as the proton and  $^{31}\text{P}$  NMR spectroscopy already run. IR spectroscopy showed some differences in the C=O peak. Based on the characterization the new product and the previously synthesized product appear to be constitutional isomers. When a sample of the new product was analyzed with IR a couple months after synthesis its spectrum matched the previous product suggesting that the new product is the kinetic isomer.

### **ANALYZING PHONETIC STRUCTURES IN FAMOUS CHILDREN BOOKS**

Presenter: Raia, Daniela  
Mentor Department: Communication Sciences and Disorders  
Faculty Mentor(s): Prof. Heidi Harbers  
Author(s): Daniela Raia

Infants, toddlers, and preschoolers learn to develop their own language system by the input they receive from their environment. They are able to listen to the speech and language of others and comprehend the meaning of some words before they are able to produce those same words. According to the National Institute of Literacy, a 1-year-old already knows a lot about spoken language. They recognize some speech sounds and they know which sounds make the words that are important to them. One of the most common ways that children develop this knowledge is by participating in shared book reading experiences with adults.

Children's books help young children learn about the subsystems in language: pragmatics, semantics, morphology, syntax, and phonology. Semantics is the vocabulary of a language. Morphology is the smallest unit of meaning in a language. Children usually learn morphemes in a book while they are also learning about semantics. Children's books also allow young children to hear the syntax, or rules for combining words into sentences, while listening to their caregiver read to them.

My poster presentation will share the results from an in-course honor's project. I will be examining the phonological aspect of language development. Phonology is a part of a language that consists of the specific sounds used in a language, the variations of sounds when produced, and the rules of combining sounds. Because children's books are used to develop language, my project analyzes the phonological structure of words used in common books. My project will analyze the words used in these books for: 1) word shape, 2) syllable shape, and 3) sounds composition of the words that children hear when being read to. Trends in these phonological aspects will be presented.

### **METALATION AND ALKYLATION OF PORPHYRINS**

Presenter: Rooney, John  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Timothy Lash  
Author(s): John Rooney, Timothy Lash

Carbaporphyrins (e.g. 1) are porphyrin-like systems where one of the pyrrolic nitrogens has been replaced by a carbon. Recently, we have shown that 1 reacts with methyl iodide in the presence of potassium carbonate to give a mixture of N- and C- methylated derivatives 2a and 3a, respectively. Metalation of 2a with palladium(II) acetate gave a palladium complex 3b where the internal methyl group had undergone an unexpected migration rather than the expected complex 2b. However, attempts to metalate 2a with nickel(II) acetate and platinum(II) chloride have been unsuccessful. Further studies are in progress to investigate the metalation of carbaporphyrins 1 and 2a.

### **EVIDENCE EVALUATION AND EXPLANATION IN A FOOD ALLERGY CONTEXT**

Presenter: Russell, Kailyn  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Steve Croker  
Author(s): Kailyn Russell

Scientific reasoning often involves suspending prior beliefs when evidence contradicts such beliefs. Kuhn, Amsel, and O'Loughlin (1988) found that responses on evidence evaluation tasks were influenced by prior beliefs. Even when covariation data were correctly interpreted, participants justified their answers in terms of new beliefs about the causal mechanisms involved. We present data from an evidence evaluation task in which participants were asked to explain their judgments about which foods were responsible for causing allergic reactions in story characters.

We presented participants with (n=39) and without food allergy (n=178) with sets of pictures representing covariation evidence for foods causing allergy symptoms. Participants were assigned to one of two conditions in which the causes of symptoms were either plausible (peanuts, milk), or implausible (fries, cola). Participants were asked which foods caused the symptoms and gave explanations for their answers. Explanations in which participants mentioned the pattern of evidence were coded as evidence-based. If participants' explanations referred to foods being healthy/unhealthy or known to cause allergic reactions, the explanations were coded as theory-based. Explanations were coded by two raters, with good inter-rater reliability ( $K = 0.75$ ).

There was a main effect of condition,  $\chi^2(1) = 3.86$ ,  $p = .05$ , with more evidence-based explanations in the plausible condition and more theory-based responses in the implausible condition. The same effect was found for explanations given by participants without food allergy  $\chi^2(1) = 4.91$ ,  $p = .027$ . However, the participants with food allergy did not differ in the frequencies of their responses across the two conditions,  $\chi^2(1) = 0.003$ ,  $p = .96$ .

The theory-based explanations given in the implausible condition suggest that participants were relying on domain-specific knowledge and not trying to consider the evidence in isolation. Participants with food allergy gave more theory-based explanations in both conditions, a pattern consistent with the need to identify a plausible causal link before data can be accepted. These findings support with Klaczynski's (2000) dual process model, in which evidence that is inconsistent with prior beliefs can be processed either heuristically or analytically. The need to refer to a causal mechanism in the implausible condition may be evidence for analytic processing of the data.

### **SYNTHETIC METHODOLOGY IN THE TSUJI-TROST REACTION: THE DEVELOPMENT OF OXADIAZINONE SCAFFOLDS FOR PHOSPHINE LIGANDS**

Presenter: Rutherford, Lily  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Shawn Hitchcock  
Author(s): Lily Rutherford, Shawn Hitchcock

This research is focused on the development of chiral, non-racemic diphenylphosphino oxadiazinone ligands from oxadiazinones based on ephedrine, pseudoephedrine and other chiral scaffolds. These ligands are used in asymmetric catalysis reactions with the test substrate 1,3-diphenylpropenyl acetate, with the goal being to increase the enantioselectivity of the Tsuji-Trost asymmetric allylic alkylation reaction. Previous work has shown the ephedrine-based ligand to have poor enantioselectivity, and the pseudoephedrine-based ligand to have a surprisingly improved enantioselectivity. This is believed to be due to the conformational flexibility at the methylated N3 position of the heterocycle. We are now synthesizing other ligands, seeking to determine if this is indeed a valid explanation of the phenomenon. This poster will outline the evolution of this project, the work that has been accomplished, and the future directions that will be pursued.

### **PHYSICAL ACTIVITY AND HEALTH-RELATED FITNESS AMONG PRE-SERVICE PHYSICAL AND HEALTH EDUCATION TEACHERS**

Presenter: Ryba, Adrienne  
Mentor Department: Kinesiology and Recreation  
Faculty Mentor(s): Prof. Skip Williams  
Author(s): Adrienne Ryba, Skip Williams

Introduction: Physical educators are supposed to be fit and good role models of what they teach. The saying "preach what you teach," is often said. Physical educators are role models for students and how they present themselves affects not only what the students see, but also impacts whether the students believe or learn what the teacher presents. How can we be effective in promoting good health and fitness if our bodies are not living testimonies of our commitment? (Wilmore, 1982). Melville and Maddalozzo (1988) found that physical education teachers who displayed good levels of cosmetic fitness had a more positive influence on their students' exercise behaviors than unfit educators. Good fitness is essential to exhibit good role modeling for K-12 students and it is something that all physical and even health education teachers need to be held accountable for. Purpose: The purpose of this study was to assess fitness levels and actual physical activity participation of pre-service physical and health education teachers. Methods: The Participants were approximately 65 physical and health education majors/minors between

the ages of 19-27. Participants completed the 8 question Physical Activity Questionnaire for Adults (PAQ-AD) (Copeland, Kowalski, Donen & Tremblay, 2005) through select survey. After the completion of the survey participants completed the Fitnessgram health-related fitness test. The Fitnessgram consists of 5 fitness assessments that measures and individuals body composition, muscular strength and endurance, flexibility and cardiovascular endurance. Results: IRB approval was obtained prior to data collection. Data has been collected and is currently being analyzed. Conclusions/Future Directions: Through this research project it is hoped that we better understand pre-service physical and health education teachers' current physical activity participation and fitness levels. Additionally, it is our hope that this study raises awareness to higher education faculty on the importance to promote physical activity participation to pre-service physical and health education teachers.

#### **WHERE CRIMES OCCUR: MAPPING CRIME IN BLOOMINGTON IL**

Presenter: Salazar, James  
Mentor Department: Geography-Geology  
Faculty Mentor(s): Prof. Jonathan Thayn  
Author(s): James Salazar

The ability to accurately predict the spatial distribution of crime, or the probability that a crime will occur in a given location, can reduce policing expenses, streamline administration, and most importantly, increase citizen and officer safety. Over 130,000 crimes were committed in Bloomington, Illinois from December 2002 to December 2012. Working in conjunction with the Bloomington Police department, we entered the location and the severity of these crimes into powerful spatial statistical software where we generated a series of crime distribution maps. The maps clearly show that the locations of crimes change from year to year, with seasons, and even with the time of day. This information will allow police officers in Bloomington to prepare for and respond to crime more efficiently.

#### **EFFECT OF GROUP SIZE ON LEARNING JOURNAL ARTICLE STRUCTURE**

Presenter: Samuelson, Jory  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Dawn McBride  
Author(s): Jory Samuelson

Humans have to work together on many things and just how efficient a team is relies on many factors. The current study analyzes the effectiveness of a learning activity requiring students to read and discuss an APA article. When discussing the article, students will be in either groups of two or four, to gauge which team size will be more effective to help the students learn about the introduction to an APA style journal article. We expect that the learning activity will increase scores from pre-test to post-test for knowledge regarding the structure and content of APA articles. In addition, previous research (Basden, Basden, & Henry, 2000) has indicated that dyads often work together more efficiently than groups larger than two. We predict that the discussion groups of two will learn more efficiently than the groups of four. We will compare the mean difference scores between the two types of groups.

#### **THE EFFECT OF TWO COOLING MODALITIES ON SKIN SENSATION AND BLOOD FLOW**

Presenter: Schodrof, Sarah  
Mentor Department: Kinesiology and Recreation  
Faculty Mentor(s): Prof. Noelle Selkow  
Author(s): Sarah Schodrof, Noelle Selkow, Jeremy Hawkins

Context: Cold air therapy has become a recent trend in the athletic population to recovery from injury. The skin is exposed to very cold temperatures, which is hypothesized to bring new blood to the injured area. However, its effectiveness has not been compared to other cooling modalities. Objective: To measure skin sensation and blood flow following 2 cooling modalities. Setting: Laboratory. Patients and other participant(s): Fourteen healthy participants volunteered between the ages of 18-30. Intervention(s): A thermometer was placed .5 cm into the Achilles tendon using sterile techniques. Subjects had an ice bag or cold air placed over the area. The ice bag was applied for 20 minutes and cold air was applied for 2 ½ minutes. The subject returned at least a week later to receive the opposite treatment. Main Outcome Measures: Skin sensation and blood flow measurements were collected at baseline, immediately after treatment, 10, 20, and 30 minutes post treatment. Expected Results: We hypothesize

that the cold air condition will have lower skin sensation and blood flow at all-time points compared to the ice bag condition. Conclusion: If our hypotheses prove to be true, we would recommend the option of using cold air therapy during rehabilitation of an injury.

### **STRUCTURE AND STABILITY OF PHENYL ISOCYANATE ANION RADICALS**

Presenter: Scholtens, Cody  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Steven Peters  
Author(s): Cody Scholtens, Steven Peters

Polyisocyanate macromolecules, such as 1-nylon, formed through poly-amide bond linkages have been widely studied as artificial helical polymers that mimic some aspects of protein structure. Some methods utilize the formation of an isocyanate anion radical to initiate the polymerization to create these macromolecules. The one electron reduction of an isocyanate and subsequent polymerization is done using alkali metals or other electron donors at low temperatures. In the following study, Phenyl isocyanate and a number of substituted analogs have been reduced with sodium metal in hexamethylphosphoramide (HMPA) and analyzed via EPR spectroscopy. Our intent in reducing these compounds is to determine the effects of both electron donating functional groups (e.g., methoxy) and electron withdrawing functional group (e.g., nitro) on the structure and stability of phenyl isocyanate anion radicals.

### **GENETIC MAPPING OF ARABIDOPSIS MUTANT WITH DEFECT IN CELL WALL AND PLANT GROWTH**

Presenter: Seifert, Stephanie  
Mentor Department: Biological Sciences  
Faculty Mentor(s): Prof. Viktor Kirik  
Author(s): Stephanie Seifert, Bangxia Suo, Viktor Kirik

Cell walls are the main support system for plants and also provide protection. Plant cell walls also act as barriers for anything harmful that comes into contact. We chose Arabidopsis thaliana to conduct our experiment because of its small genome size, thick cell walls, and stereotypic shape, making it a useful model for genetic mapping and sequencing. Specifically, the research focuses on the cell walls to determine the leaf hair (trichome) phenotype. PCR based chromosome walking was used to map the 316 mutant, which we found to have a defect in trichome cell wall. While studying segments of DNA, we used SSLP markers for mapping. Our goal was to find plants that had high amounts of Columbia and low to no amounts of *Landsburg erecta*, or less recombination to determine where on the chromosome our 316 mutant was located. Out of the five chromosomes, chromosome three contained the highest amount of Columbia hits, telling us that is where our mutant was located. When looking at the phenotype we saw that the wild type had white trichomes and the mutant had a glassier look. The information from this study will allow us to further determine which genes are important for cell wall formation in plants.

### **THE INFLUENCE OF ALKALI METAL ION ASSOCIATION ON THE CHEMISTRY OF ARYL ISOCYANATE ANION RADICALS**

Presenter: Servos, Mark  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Steven Peters  
Author(s): Mark Servos, Steven Peters

Through the cyclotrimerization of isocyanates, the versatile and increasingly popular isocyanurate can be created. Used in a variety of polyurethane blends, isocyanurates are able to increase their impact resistance and transparency. They are also becoming more widely used in the fields of pharmacology and nanochemistry. In these experiments, the full and partial reductions of both phenyl and p-tolyl isocyanate were performed in hexamethylphosphoramide (HMPA) or tetrahydrofuran (THF). Exposure of these solutions to alkali metals results in the one electron transfer forming their respective anion radicals. Under conditions where ion association is absent (e.g., in HMPA) spectroscopic data reveals that the stable anion radical of each isocyanate is observed. Alternatively, when the potassium metal reduction is carried out in THF (a solvent where ion association is common) a rapid cyclotrimerization occurs that is initiated by the isocyanate anion radical. Spectral data reveal that a stable isocyanurate anion radical is formed. Furthermore, when sodium metal is used as the reducing agent, the

isocyanurate anion radical is further reduced to the dianion. Both electron paramagnetic resonance and nuclear magnetic resonance techniques were utilized in exploring the structure of these isocyanate anion radicals and isocyanurate dianions.

### **EFFORTS TOWARD A MORE EFFICIENT SYNTHESIS OF A HUMAN T-CELL LEUKEMIA VIRUS PROTEASE INHIBITOR**

Presenter: Simpson, Chad  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Shawn Hitchcock  
Author(s): Chad Simpson, Shawn Hitchcock

The focus of this research program is the synthesis of a pharmaceutical agent known as a human T-cell leukemia virus protease inhibitor. There are a limited number of examples of the synthesis of this drug that have been reported in the chemical literature. Our research group is interested in developing a more efficient preparation of this drug using synthetic organic chemistry based on asymmetric glycolate aldol reactions. The synthesis plan uses a series of commercially available starting materials and uses the concept of chiral auxiliaries based on the oxazolidinone model developed by Evans and coworkers. The principal chiral auxiliary that has been used in this research thus far is an oxazolidinone derived from L-phenylalanine. This poster will illustrate the work that has been accomplished up to this point.

### **COMPARTMENTAL MODEL EQUATIONS FOR THE CRAB'S STOMATOGENIC NEURAL SYSTEM**

Presenter: Skilling, Quinton  
Mentor Department: Physics  
Faculty Mentor(s): Prof. Epaminondas Rosa  
Author(s): Quinton Skilling

It is not uncommon to find subnetworks of nervous systems containing interacting neurons oscillating over a large range of frequency values. One such example is the stomatogastric nervous system of the crab *Cancer borealis*. It produces a fast pyloric rhythm and a notably slower gastric mill rhythm. Here we present conductance-based model equations intended to study the activation effects of the modulatory commissural neuron 1 (MCN1) on the crab's gastric mill rhythm. Our approach consists of extending the original Huber-Braun neural equations to the multi-compartmental model. This model allows for physiologically meaningful tree topologies with branches, which adds to the complexity of the model, but uses simplified interactions between branches to compensate. Preliminary results show good agreement with experimental results, collected from the literature, obtained in vitro from the real stomatogastric neural system of the crab.

### **ROLE OF IDENTITY ACHIEVEMENT IN SOCIAL ANXIETY**

Presenter: Steakley-Freeman, Diana  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Jeffrey Kahn  
Author(s): Diana Steakley-Freeman, Martin Gallegos

The goal of this study will be to examine the relationship between social anxiety and identity achievement. Social anxiety can influence one's ability to establish relationships, as well as hinder emerging adults' ability to achieve important developmental milestones like establishing new relationships with mentors and peer groups (Burstein, 2012). While much independent research has been done on identity status and the developmental consequences of social anxiety, very little has been done on the relationship between the two variables. Further understanding and exploration of the aforementioned relationship can aid clinicians in the assessment, understanding and treatment of social anxiety.

Participants will score into four identity status groups: Achievement Status (explored his/her identity options and committed themselves to a lifestyle or path), Foreclosure Status (not exploring his/her options but committing to a path nonetheless), Moratorium Status (actively exploring his/her options, but not committing to anything), or Diffusion Status (neither exploring options, nor committing to an identity). Clancy and Dillinger (1993) found that participants in the Identity Moratorium Status had higher overall anxiety. This can be explained by the psychologically unpleasant state characterized by Moratorium status. Social anxiety is a facet of overall anxiety, and I predict that the highest social anxiety will come from the groups with the lowest degree of

commitment—Moratorium and Diffusion, and the lowest social anxiety will come from Achievement and Foreclosure groups. The lack of motivation to explore one’s identity, as characterized by the Diffusion status, may render them unconcerned (and therefore less anxious) about their lack of direction.

The Extended Objective Measure of Ego Identity Status-Revised (EOM-EIS-R; Bennion & Adams, 1986) will be used to measure the extent to which 18- and 19-year old college students identify with each achievement status based on the Marcia (1967); identity Achievement, Moratorium, Foreclosure, and Diffusion. The Brief Fear of Negative Evaluation Scale (FNE; Leary, 1983) will be utilized to measure social anxiety in participants. If clinicians and researchers can better understand social anxiety, further research into the treatment and possible prevention of social anxiety can be explored.

### **THE EFFECT OF ROSE BENGAL ON THE VIABILITY OF AXENIC LEISHMANIA CELLS**

Presenter: Sternisha, Shawn

Mentor Department: Chemistry

Faculty Mentor(s): Profs. David Cedeño and Marjorie Jones

Author(s): Shawn Sternisha, David Cedeño, Marjorie Jones

Photosensitizers such as rose bengal (4,5,6,7-tetrachloro-2',4',5',7'-tetraiodofluorescein) are increasingly being used to treat cancers and inhibit bacteria. We evaluated the effects of rose bengal on the protozoan parasites, *Leishmania tarentolae* in culture. *Leishmania* are parasitic protozoans which infect more than 12 million people worldwide and for which there are few good drugs. Rose bengal, with and without encapsulation into silica nano-particles, was incubated with cell cultures, with and without light exposure. Cell viability was assessed using the 3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay and by light microscopy. Nano-particles were loaded by stirring a dispersion with a 160 µM solution of rose bengal in water, followed by centrifugation multiple times, with the absorbance of the supernatant measured after each centrifugation step. The spectral data confirmed that approximately 60% of the rose bengal was encapsulated. Cells incubated with encapsulated rose bengal or with nano-particles only resulted in the same cell viability (without and without light exposure). They also exhibited no major abnormalities by microscopy. We speculate that this is likely due to limited diffusion of rose bengal out of the nano-particles into the medium during the time of the assay. Cells incubated with free rose bengal (at 20 µM) were inhibited about 86% (following light exposure) relative to control cells and approximately 34% (no light exposure) relative to control cells. The cells exposed to the rose bengal assumed a different shape than control cells as observed by microscopy. Future work will focus on increasing the rose bengal nano-particle load and release as well as determining dose-response curves. Such studies may lead to use of rose bengal as a photodynamic therapy agent for cutaneous leishmaniasis.

### **DEVELOPMENT OF RECREATIONAL THERAPY PROCESS: A CASE STUDY**

Presenter: Stocco, Marianna

Mentor Department: Kinesiology and Recreation

Faculty Mentor(s): Prof. Melissa Zahl

Author(s): Marianna Stocco, Melissa Zahl

Dementia is a progressive disability in which cognitive function decreases. The prevailing symptom of dementia is continued deterioration of memory (learning and retrieving information). However, other symptoms that may be as problematic may include but not limited to declining ability to recognize one’s relationships, orientation to others, day, and place, impaired ability to solve problems, declining ability to focus attention on the task at hand, impaired mental functions related to language, and declining ability to act in a socially appropriate and contextually appropriate manner in relationships (Porter & Burlingame, 2010; “what is dementia” <http://www.alz.org/what-is-dementia.asp#dementia>). In addition to those symptoms, many individuals with dementia will have secondary problems. Secondary problems may include but not limited to agitation and aggression, pressure sores, depression, sleep disturbance, muscle weakening, pacing, or psychosis (Porter & Burlingame, 2010). There is no cure for dementia; however treatment is used that “is to support the remaining functions of the client and to make the client comfortable” (Porter & Burlingame, 2010, p. 55). The role of recreational therapy in the approach to treat a person with dementia is to focus on “physical exercise, activities that the client can do, validation training simulating senses, stress reduction, and compensatory strategies” (Porter & Burlingame, 2010, p. 56).

The nature of this case study is to implement the Therapeutic Recreation (TR) process with an individual with

dementia and bipolar disorder (case study subject). The TR process involves assessment, planning, implementation, and evaluation of an individual. From the assessment, a program plan is designed that will best meet the needs of the case study subject. The plan only occurs after the assessment is completed. This student facilitated case study will assess the individual in four domains (cognitive, physical, affective, and social functioning), plus leisure. Once assessment is completed planning, implementation, and evaluation can occur. When providing treatment through interventions, and following the TR process it is considered recreational therapy. During each phase of the TR process, the student will receive clinical supervision to ensure professional growth of the student as well as ensuring safety for the case study subject receiving intervention.

### **PHOSPHATIDYLCHOLINE BIOSYNTHESIS IN LEISHMANIA: CLONING AND EXPRESSION OF CTP:PHOSPHOCHOLINE CYTIDYLYLTRANSFERASE**

Presenter: Stoller, Jeanette  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Jon Friesen  
Author(s): Jeanette Stoller, Justin Lange, Alisha Morganthaler, Jon Friesen

*Leishmania major* is a single-cellular protozoan parasite causing the disease leishmaniasis, which is prevalent in many regions of the world including portions of Central and South America, Africa, and the Middle East. *L. major* has been found to have the CDP-choline pathway, which is a series of reactions in the biosynthesis of phosphatidylcholine, a major membrane component. One step in the CDP-choline pathway utilizes the enzyme CTP:phosphocholine cytidylyltransferase (CCT) to convert CTP and phosphocholine into CDP-choline. In this study, the CCT enzyme in *L. major* (LmCCT) and a truncated form of this enzyme which is believed to be the catalytic region (LmCCTtrun) are expressed in *Escherichia coli* and *Leishmania tarentolae* for further characterization with a series of enzymes assays.

### **PAIR CREATION FOR BOSONS IN ELECTRIC AND MAGNETIC FIELDS**

Presenter: Su, Alexander  
Mentor Department: Physics  
Faculty Mentor(s): Profs. Rainer Grobe and Q. Su  
Author(s): Q.Z. Lv, A.C. Su, M. Jiang, Y.J. Li, R. Grobe, Q. Su

By solving the quantum field theoretical version of the Klein-Gordon equation numerically, we study the creation process for charged boson/antiboson pairs in static electric and magnetic fields. The fields are perpendicular to each other and spatially localized along the same direction, which permits us to study the crucial impact of the magnetic field's spatial extension on dynamics. If its width is comparable to that of the electric field, we find a magnetically-induced Lorentz suppression of the pair creation process. When the width is increased such that the created bosons can revisit the interaction region, we find a region of exponential self-amplification that can be attributed to a spontaneous emission-like enhancement. If the width is increased further, this trend is reversed and the magnetic field can even shut off the particle production completely [1].

[1] Q.Z. Lv, A.C. Su, M. Jiang, Y.J. Li, R. Grobe and Q. Su, Phys. Rev. A (in press).

### **PHOSPHOROUS CONCENTRATIONS IN SIX MILE CREEK AND MONEY CREEK, MCLEAN COUNTY, IL**

Presenter: Sugano, Laura  
Mentor Department: Geography-Geology  
Faculty Mentor(s): Prof. Catherine O'Reilly  
Author(s): Laura Sugano, Evan Meinzer, Laura Hanna, Rick Twait, Catherine O'Reilly

Keeping drinking water resources safe and uncontaminated is important to the economic, social, and environmental quality of the United States. Phosphorous nutrient levels influence water quality, affecting the life in the water. Specifically, in our study, we are focusing on the phosphorous concentrations in the water samples. The samples were collected on a biweekly basis from main tributaries that flow into drinking water reservoirs for Bloomington, Illinois: Money Creek and Six Mile Creek. Samples were also collected during storm events. We measured concentrations of phosphorous in water samples using a spectrophotometer. Introductory results indicate that phosphorous concentrations vary from 5 to 90 micrograms per liter in storm event samples.



### **THERMALLY-RESPONSIBLE GOLD-POLYMER NANOCOMPOSITES FOR CONTROLLED CHEMICAL REACTIONS**

Presenter: Sullivan, Jamie  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Jun-Hyun Kim  
Author(s): Jamie Sullivan, Chase Brackemyer, Brett Boote, Jun-Hyun Kim

This study describes the thermally controlled chemical reaction in the presence of multiple gold cores within a poly(N-isopropylacrylamide) nanoparticle. The formation and properties of these nanocomposites was thoroughly examined by electron microscopes, UV-visible spectrophotometer, and dynamic light scattering. Unlike bare gold nanoparticles, these nanocomposites exhibited high stability under various temperatures and/or pHs. Subsequently, these nanoparticles were employed in the catalytic reduction of 4-nitrophenol, whose reactivity was significantly faster at room temperature than above 40 °C due to the deswelled polymer structure presumably preventing the access of hydrophilic reactants to the gold cores. This highly controllable chemical reaction using these nanocomposites can allow for the development of a unique nano-scale chemical reactor.

### **FINAL STATE SENSITIVITY OF CHARGED PARTICLES IN A MAGNETIC NEUTRAL LINE FIELD**

Presenter: Svetich, Jamie  
Mentor Department: Physics  
Faculty Mentor(s): Prof. Richard Martin  
Author(s): Jamie Svetich, Richard Martin

Interactions between plasma particles and Earth's magnetic field are relevant to magnetic storms, which affect the aurora, radio communications, and the power grid. Observations indicate a region in the Earth's magnetotail is important in the dynamical processes involved. In this presentation, we will concentrate on particle dynamics in a magnetic neutral line field, where the magnetic field goes to zero along a line across the magnetotail. Previous work has shown scattering in a current sheet field has fractal behavior and we would like to see if the neutral line exhibits the same properties. The motion is known to be chaotic for some parameters and we will investigate final state sensitivity after the particles scatter off the neutral line region. In particular, we will report on possible fractal structure of the boundary between exit basins.

### **SURFACE SWABBING PROTOCOL OF FORENSIC SAMPLES OF INTEREST**

Presenter: Swiontek, Alex  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Christopher Mulligan  
Author(s): Christopher Mulligan, Alex Swiontek

The goal of the swabbing research is to determine the transfer efficiencies for commercially-available swabs in certain solvents. Some solvents of interest include methanol and isopropanol. This will be done with GC-MS and compared against a standard to determine how well the sample was extracted. A common drug of abuse, cocaine, will be tested against a standard, cocaine-d3, and this will be used to determine transfer efficiency.

### **PERCEPTION OF MAXIMUM REACHING HEIGHT IMPROVES WITH PRACTICE IN RELATED REACHING TASKS**

Presenter: Taheny, Craig  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Jeffrey Wagman  
Author(s): Craig Taheny, Jeffrey Wagman

Practice performing a given task (e.g., vertical reaching while standing on the floor) improves perceptual accuracy for both this task related tasks (e.g., vertical reaching while standing on a steps tool).

This experiment investigated the perception of maximum reading height for three different means of reaching. The three means of reaching were standing while reaching, kneeling while reaching, and standing on a stepstool while reaching. The perceived maximum reaching heights were recorded under these three conditions. A practice group received practice in the standing and reaching condition and a control group received no practice. It was found that

perception of maximum reaching height in all three reaching tasks improved from pre-test to post-test with practice reaching while standing. There was no change in perception of maximum reaching height when no practice was provided.

### **SYNTHESIS OF HETEROBENZIPORPHYRINS**

Presenter: Toney, Ashley  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Timothy Lash  
Author(s): Ashley Toney, Timothy Lash

Benziporphyrins are porphyrin analogues with a benzene ring in place of one of the usual pyrrole units. Although this system is nonaromatic, protonation leads to the formation of a dication with significant diatropic character. In order to further investigate the phenomenon, hetero-analogues 1 of benziporphyrins have been synthesized. Tripyrrane analogues 2 were prepared by reacting dicarbinols 3 with pyrrole in the presence of  $\text{BF}_3 \cdot \text{Et}_2\text{O}$ . Further reaction with furan or thiophene dicarbinols 4 afforded the desired macrocycles 1. Protonation of these novel porphyrin analogues reveals the presence of weak diatropic ring currents.

### **MILITARY OCCUPATION CORRELATION TO VETERANS WITHIN THE LABOR MARKET**

Presenter: Tonkovic, Michael  
Mentor Department: Economics  
Faculty Mentor(s): Prof. Daniel Rich  
Author(s): Michael Tonkovic

Which branch? Which job? How can the military benefit me? These are questions asked by many deciding whether or not they should enlist in the military. The purpose of my thesis is to develop a starting point answering these questions using economical analysis.

I came up with the idea behind my thesis after I began questioning individual characteristics about myself before and after the military. I myself am a veteran who served in the United States Marine Corps as an infantryman for two combat tours in support of Operation Iraqi Freedom. After I was discharged, it was as if I was a completely different person than before I went in. I then began noticing former peers I served with and questioned, "Were their lives like mine?" Day after day questioning myself, "Why did I join the Marine Corps and not the Air Force? Why did I join the infantry? What good is the infantry going to do for me when I get out? What skills can I bring to find success in the job market besides one's for law enforcement?"

After collecting and analyzing data I plan on developing an economical model representing research found by both survey and literary analysis. Over the past six months I've been researching numerous economical studies similar to mine. My mentor, Dr. Billger, Economics, has been explaining the entire process of creating and distributing a survey for collecting data while using human subjects with all the appropriate procedures, including IRB approval.

The survey consists of numerous questions based on three aspects of a veteran's life: before military, during military, and after military. Each question was carefully written and placed to cancel any possible bias found in correlations discovered. All subjects who volunteered to take the survey remained completely anonymous one hundred percent of the time, and were found using various networks within the U.S Government such as Department of Veteran Affairs and social networking sites like Facebook.

Once complete, I would like to reach out to our nation's youth who have future aspirations of the military. Paint the picture, "If you want a career in law enforcement you should focus on jobs dealing with combat more than fighter jet maintenance."

In my own life, I have strong aspirations to earn a doctoral degree in Economics while focusing a majority of my research on veterans. My thesis has been extremely beneficial both on a personal and professional level because it has shown me the amount of time and effort results can take.

## **TRENDS OF ADOLESCENT FAMILIAL ABUSE AT ILLINOIS STATE UNIVERSITY**

Presenter: Tracy, Sylvie  
Mentor Department: Curriculum and Instruction  
Faculty Mentor(s): Prof. May Jadallah  
Author(s): Sylvie Tracy

The purpose of this study is to gain perspective of the nature of familial abuse experienced among adolescents. The onset of child abuse occurs averagely between the ages of 4 and 6, depending on the type of abuse. The shortest duration of abuse occurs with sexual abuse, ending averagely at age 14. Though the cycle experienced by abused children typically persists beyond age 12, research is primarily focused on young children or on abuse in general. Minimal research has been conducted based on the nature of abuse for the isolated adolescent group. By doing this study, I hope to answer a set of four questions: (a) What are the types of abuse that adolescents ages 12-17 experience and how prevalent is each type? (b) To whom do the abused adolescents disclose; by disclose we mean when an adolescent tells somebody, intentionally or unintentionally, about the abuse he or she is experiencing. (c) To what extent are participants aware of available resources including, but not limited to, other family members, friends, school and religious personnel? (d) To what extent are participants aware of and/or have experienced immediate and delayed psychological affects of the abuse?

The participants of this study will include whomever of the 19,700 Illinois State University students and faculty who have opted to receive surveys through the Select Survey System and choose to complete this survey. They will be contacted via e-mail with a link to the survey if they wish to complete it. The survey is composed of 26 questions encompassing the following categories: the nature of abuse, disclosure, awareness of resources, and psychological implications.

The research will be completed during the Spring 2013 semester. The survey will be sent on upon approval from the International Review Board (IRB), and then the results will be analyzed. Based on the research, it is expected that the results will portray greater prevalence of abuse involving female victims. The onset of the cases disclosed in this study is expected to be between the ages of 4 and 6. Reports of Post Traumatic Stress Disorder (PTSD), depression, early sexual encounters, and use of substances, such as alcohol, are expected –especially among those who experienced sexual abuse. It is expected that participants disclosed to someone of the abuse or acknowledge there was someone that they were regularly around who knew of the abuse and did not take action.

## **HELPING THE HAREDI: AN ANALYSIS ON SEX EDUCATION RHETORIC**

Presenter: Tristano, Michael  
Mentor Department: Communication  
Faculty Mentor(s): Profs. Megan Koch and Jon Carter  
Author(s): Michael Tristano

Considered the most orthodox of all sects of Judaism, the Haredi Jews have long swept crimes of sexual abuse under the rug. The Jerusalem post of May 15<sup>th</sup>, 2012 laments, in particular, children that are victims of sexual abuse struggle to speak up about what has happened to them. However, complete with illustrations, a new book has come out to bring the issue of child sex abuse into Haredi classrooms for the first time. Mutav Lehighaher K'dei lo Lehitza'er. While it is a reinterpretation of a popular English book, Better Safe Than Sorry, In order to function in such an ultra-conservative culture, the book attempts to educate children without using so called obscene words like “penis, vagina, or sex.” Because this book could provide insight on how to introduce taboo topics in a conservative and previously unreceptive culture, we must ask today’s research question: how can messages about sexual health be successfully translated for a conservative religious culture? To answer this question we will turn to Peter Pugsley’s model Sex and the City State: A Study of Sexual Discourse in Singaporean Women’s Magazines published in the September 2007 edition of the Asian Journal of Communication. And besides being fabulous, this model is appropriate for our analysis because it studies women’s magazines, specifically publications that deal with women’s sexuality, that reinterpret a text to break through a barrier of cultural taboos. So lets first, examine Pugsley’s model, then apply it to Mutav, before finally drawing critical implications about a book, that Nitai Melamed, one of the books co-authors, describes as “It’s like printing a recipe in a cookbook, without saying the word food.”

## **MEMORIES OF SCHOOL: A COMPARISON OF HIGH-RISK AND LOW-RISK MOTHERS**

Presenter: Veitch, Hillary  
Mentor Department: Curriculum and Instruction  
Faculty Mentor(s): Prof. Kyle Miller  
Author(s): Hillary Veitch, Kyle Miller

Parents are typically the primary caregivers of children's development, and a family's background and characteristics have a large impact in a child's learning environment both at home and with their connections to school. Research typically focuses on current practices and characteristics of parents, and often ignores the role of parents' educational histories and memories of school. The purpose of this study was to explore how mothers remember their school experiences and to examine similarities and differences on memories of school between high-risk and low-risk mothers. This qualitative study consisted of forty interviews regarding recollections of schooling, utilizing a five-step process, along with NVivo 9 to develop themes and codes throughout the data. Based on a preliminary analysis, mothers recalled very vivid memories of school, and for almost all of the participants, they currently contribute to how they view schools and their relationships with their children's learning. Comparing high and low risk mothers revealed that higher risk mothers reported more negative or challenging memories of school, whereas lower risk mothers reported more positive and rewarding experiences in school. Themes and subthemes for each group of mothers will be presented. Through the analysis of mothers' memories, we begin to understand how educational histories and experiences in school contribute to mothers' current circumstances and attitudes toward schools. Because parents have such an immense influence on a child's readiness and attitudes towards school, we as educators need to be aware of the various backgrounds of our students and be receptive to their multiple learning experiences within the family community. Very little work has been done in this area, and this inquiry will provide a foundation for further research and important implications for professionals in the field.

## **VIRTUAL PARTICLES AND THE PHYSICAL VACUUM**

Presenter: Vikartofsky, Andrew  
Mentor Department: Physics  
Faculty Mentor(s): Profs. Charles Su and Rainer Grobe  
Author(s): R.E. Wagner, M.R. Ware, A.M. Vikartofsky, Q. Su, R. Grobe

We discuss the role of virtual particles in the description of the physical vacuum. Through simple one-dimensional  $f^2$ - and  $f^4$ -model systems we have demonstrated how the physical vacuum can be decomposed into the bare vacuum and virtual particles [1]. We analyze the momentum distribution of the vacuum virtual pairs as well as the spatial and temporal correlations between virtual particles for both systems. We summarize recent efforts to complement quantum simulations with semi-classical treatments.

## **A SPACE-TIME RESOLVED APPROACH FOR INTERACTING QUANTUM FIELD THEORIES**

Presenter: Ware, Matt  
Mentor Department: Physics  
Faculty Mentor(s): Profs. Charles Su and Rainer Grobe  
Author(s): R.E. Wagner, M.R. Ware, B.T. Shields, Q. Su, R. Grobe

We present an alternative approach [1] to the usual perturbative S-matrix evaluation of quantum field theories. This technique is non-perturbative and provides the full space-time resolution of the quantum fields. The method is used to study the dynamical development of the force between two fermion wave packets for a one-dimensional Yukawa Hamiltonian model. The spatial distribution of the virtual bosons that act as mediators of the force can be analyzed along with the fermionic densities. The fermion-fermion interaction can be approximated by a potential function, which is used for a comparison of the quantum field theoretical densities with the ones obtained from the corresponding classical and quantum mechanical dynamics. It is shown that these models are good approximations to the exact field theoretical calculations when the Fock space is restricted to only one boson, but in the full quantum field theory the fermion-fermion force is enhanced by higher-order multi-boson processes. Furthermore, the normally attractive fermion-fermion Yukawa force can in principle be manipulated to even be repulsive if the momentum modes available to the virtual bosons are restricted.

### **CONTESTED NATION: FREEDMEN AND THE CHEROKEE NATION**

Presenter: Watt, David  
Mentor Department: History  
Faculty Mentor(s): Prof. Linda Clemmons  
Author(s): David Watt

The Freedmen are, most simply, those individuals that have been freed from bondage. In the United States this term is often used in reference to legally emancipated slaves and consequently, their descendants. The term "Cherokee Freedmen" refers to those freed slaves who joined with the Cherokee Nation, or, men and women who were formerly held in servitude within the Cherokee Nation. This term has also been given to the descendants of marriages involving freed Africans and Cherokee spouses, thus making the network of people labeled Freedmen an expansive group of people. Totalling roughly 3000 people in the present day, Cherokee Freedmen have had a history of a strongly contested citizenship and relationship to the Cherokee Nation. At first held as slaves and then forcibly freed at the hands of the United States government, the Cherokee Freedmen are today trying to regain and cement their acceptance into the Nation and no longer be relegated to a position of secondary citizens or not members at all. This paper looks at the long standing history of slavery and relations between slaves and the Cherokee people historically and up to the present day legal battles for citizenship rights.

### **COMPARISONS OF SOCIOECONOMIC STATUS, CHILDHOOD SEXUAL ABUSE, AND SEXUAL ASSAULT AS AN ADULT**

Presenter: Wenger, Emily  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Marla Reese-Weber  
Author(s): Emily Wenger

This research study examines the relationship between socioeconomic status and childhood sexual abuse and does a comparison of childhood sexual abuse and sexual assault as an adult. The participants included undergraduate students at Illinois State University who were given extra credit in exchange for their participation. The demographic questionnaire that was given assessed the socioeconomic status of the participant's parents. Participants completed a survey to measure their previous experience with childhood sexual abuse and recent experience with sexual assault. Hypothesis one states that individuals who rank lower on the socioeconomic status will have had a greater likelihood of experiencing child sexual abuse. Hypothesis two states that individuals who were sexually abused as children will also be more likely to have experienced sexual assault as an adult. Implications of the study will be discussed in further detail.

### **THE COMMITMENT AND RELATIONSHIP CHANGE OF FRIENDS WITH BENEFITS: SEX DIFFERENCES**

Presenter: Williams, Maya  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Marla Reese-Weber  
Author(s): Maya Williams

The purpose of the current research is to examine the gender differences of attachment of individuals in a Friends with Benefits (FWB) relationship and if the individuals would want a future committed relationship. The participants in this study was 380 undergraduate student attending Illinois State University from the ages of 18 to 25 years. Participants were given an extra credit point for class for participating. Participants completed a questionnaire to assess their attachment styles and current relationship type. Participants were also given a survey on their FWB relationship. Hypothesis one and two was not supported such that men and women did not show a difference in attachment styles and desire to further their FWB relationship into a committed relationship.

## **LUMINESCENCE STUDIES OF HEXANUCLEAR RHENIUM CLUSTER COMPLEXES**

Presenter: Wilson, Wade

Mentor Department: Chemistry

Faculty Mentor(s): Prof. Lisa Szczepura

Author(s): Wade Wilson, Jessica Durham, Lisa Szczepura, David Cedeño,

The compounds of interest in the Szczepura group are termed supraoctahedral cluster complexes and these compounds have the following formula:  $[M_6(\mu_3-X)_8L_6]^n$ , where M represents the metal (this is usually molybdenum or rhenium),  $\mu$  represents the bridging ligand, X represents a halide or chalcogenide (this is usually selenium), and L represents the terminal ligands. Recently, the Szczepura group published a manuscript that discussed the preparation of a family of ten hexanuclear rhenium cluster complexes and these compounds have been shown to display luminescent properties. Efforts in determining the quantum yields of these compounds are reported. The method of quantum yield determination being utilized is the comparative method of quantum yield determination. This method requires an appropriate reference compound with an accurate quantum yield value, and this has so far posed to be a difficult step in the process of quantum yield determination for the compounds of interest. Past, current, and future research will be presented regarding the work towards determining these compound's quantum yields.

## **ATTENTION TESTS: BRINGING SELF-REPORT TESTS IN LINE WITH ACTUAL ABILITY**

Presenter: Wing, Ellen

Mentor Department: Psychology

Faculty Mentor(s): Prof. Joel Schneider

Author(s): Ellen Wing

It is hard for the public to be confident that diagnoses of attention-deficit/hyperactivity disorder are valid because all of the methods clinicians use to assess attention problems (questionnaire ratings, attention tests, direct observation, and brain scans) have low correlations with each other. That is, if none of the methods agree, which one is correct? The aim of this study is to investigate conditions in which self-reports of attention problems and attention ability tests are likely to agree with each other and conditions in which they are likely to give discrepant information. In this study, three variables will be manipulated. In order to reduce social desirability biases, objective self-awareness will be induced in half of the participants by means of a mirror while they complete questionnaire ratings of attention problems. In order to reduce the ambiguity of the word "attention," half of the participants will be encouraged to think about their attention problems in a very specific situation (i.e., listening to a boring lecture). In order to reduce the ambiguity of the reference group to whom participants compare their attention problems, half of the participants will be instructed to compare their attention abilities to other college students in their classes. It is hypothesized that each of these manipulations will increase the correlation between attention ability tests and self-reported attention problems. The results of the study may have implications for how questionnaires measuring self-reported attention problems should be administered in clinical settings.

## **USING MODERN TECHNOLOGY TO INCREASE AND TRACK CALORIE EXPENDITURE**

Presenter: Wolfe, Alex

Mentor Department: Kinesiology and Recreation

Faculty Mentor(s): Prof. Dale Brown

Author(s): Dale Brown, Alex Wolfe, Maria Canino

Inactivity and obesity is a significant problem that Americans are struggling with today. Obesity and other complications that are adopted from living a sedentary lifestyle have increased over the past few decades. It has been found that as age increases, the amount of physical activity gradually declines. Calories are also being consumed in amounts greater than the number of calories being expended throughout the day and week. Lack of physical activity combined with the over consumption of food is what led to the obesity epidemic that our country is currently experiencing. Unfortunately, the public is neglecting to take neither preventative nor aggressive action to putting a halt to this growing epidemic. Participating in the minimum requirements physical activity, it can help prevent and even decrease risk of developing chronic diseases associated with sedentary and unhealthy lifestyles

such as cardiovascular diseases, metabolic diseases, hypertension, etc. Aside from following a formalized exercise regiment consistently, it also important to maintain physically active throughout the day and not becoming sedentary after completing a workout.

Technology is also becoming more advanced. Cell phones are high demand devices that provide the latest news and updates to consumers. Engineers have designed cell phone applications to help make it easier for people to monitor, assess, and track their calorie expenditure as well as consumption of foods. In all honesty, there should be no excuse for this escalating obesity epidemic when tools are readily available and have been provided to the public to aid in the transition of being overweight and obese to reaching a healthy body composition. Specifically, Polar came out with a cell phone application to be used along with their Bluetooth heart rate monitor to track heart rate, time and pace, distance, steps, and calories burned in order to log workouts to track progress. Another gadget that is increasing in usage is the SenseWear Pro software. SenseWear provides armbands that are an accelerometer and skin response monitor that track calories expended, steps, and even sleep to give a gross calorie expenditure per day.

The goal of this study was to promote and educate the importance of being physically active while demonstrating how relatively easy it is to fit extra movement throughout a college student's day. Faculty and staff members can also benefit from the information. Increasing physical activity for a college student can be done simply by walking to campus and moving around campus instead of using the readily available transportation. By providing mapped out common pathways on campus that can be utilized by college students, this should set the initial start of increasing incidental physical activity outside of a scheduled work out completed at the gym or at home.

### **GROUP HEART RATE MONITORING DURING EXERCISE USING THE POLAR CARDIOGX SYSTEM**

Presenter: Zook, Kelly  
Mentor Department: Kinesiology and Recreation  
Faculty Mentor(s): Prof. Dale Brown  
Author(s): Kelly Zook

Technological advancements are providing new and innovative ways for individuals and trainers to monitor the physiological responses to physical activity. Cardiovascular heart rate responses to activity are, perhaps, the most accurate way to gage exercise intensity. The older style heart rate monitors, while accurate, were typically beneficial only to the wearer of the monitor, and data was usually only available upon completion of the workout session. New technology allows for group monitoring that both the trainer and the participant can use to get real time information about the individual's physiological response to exercise. This project will examine the feasibility of using a group heart rate monitoring system (Polar CardioGX) during exercise programs.

More specifically, I will be using this software in various Active for Life courses here on campus. Within each class, individuals will wear heart rate monitors, and their physiological responses to an exercise session will be monitored and recorded. The data collected will be used to compare the individual responses to the same exercise program as it is performed at a later date. This will be done in hopes that each individual will not only see progression in cardiovascular fitness from one session to the next, but will have easy access to that information as it is presented through the Polar CardioGX System.

## **GROUP PROJECTS**

### **NEW BEGINNINGS**

Primary Presenter: Afzal, Sarah  
Secondary Presenter(s): Nayelli Cisneros, Samantha Mazgay, Elizabeth Soteno  
Mentor Department: Politics and Government  
Faculty Mentor(s): Prof. Michaelene Cox  
Author(s): Sarah Afzal, Nayelli Cisneros, Samantha Mazgay, Elizabeth Soteno

This camp is a newly established transitional camp for displaced peoples feeling the conflict in Libya, located along the southern side of highway route P1, 8.5 kilometers west of the Ra's Ajdir border crossing facility. We feel that it is a good way to learn about refugee camps by obtaining information on recently established camps. Due to recent conflicts in Libya, citizens have fled the country for a multitude of reasons. Citizens have also fled due to social injustice and the lack of goods and services being provided by the government. The conflict between Colonel Muammar al-Qadhafi loyalists and revolutionary activists continues in major cities. With all this conflict we have to ask ourselves, how the international community is helping to maintain the camp. We plan on acknowledging why the conflict has started, how the people are moving into this refugee camp, and how international organizations are helping. We will gather information that will connect the past and future refugee camps, so we can better understand this global issue, to acquire the knowledge on the restrictions on how the world can correct the injustices around the world.

### **THE ROLE OF JOB CHARACTERISTICS IN ADOLESCENTS' WORK ENGAGEMENT AND JOB SATISFACTION**

Primary Presenter: Archos, Hannah  
Secondary Presenter(s): Adam Hampton  
Mentor Department: Psychology  
Faculty Mentor(s): Profs. Kimberly Schneider and Patricia Jarvis  
Author(s): Kimberly Schneider, Patricia Jarvis, Hannah Archos, Adam Hampton

Although the topic of "burnout" has generated much psychological discussion in the past decade, less attention has been paid to its antithesis – work engagement. However, as psychology strays from the study of negative states, it emphasizes topics of enrichment and wellness to a greater degree. Such topics include work engagement and job satisfaction. Work engagement is associated with the affective components of the worker. It is defined as the vigor, dedication, and fulfillment employees feel about their work (Bakker, Schaufeli, Leiter, , & Taris, 2008). Job satisfaction is the degree of pleasure an employee derives from a particular job (Muchinsky, 2000).

The current study examined high school students' work engagement and job satisfaction as correlated with job type and perceived relevance of adolescents' part-time job skills to their future career goals. The sample was limited to students from 14-17 years of age. The scales used included the Job Descriptive Index (perception of coworkers) to measure job satisfaction, the Utrecht Engagement Scale to assess work engagement and the Job Diagnostic Survey to assess five job characteristics (skill variety, task significance, task identity, autonomy, and feedback from the job).

It was hypothesized that frequent performance feedback, high autonomy, and positive impressions of co-workers and supervisors would positively impact job satisfaction. It was also proposed that the perceived future usefulness of current job skills would be significantly correlated with work engagement and job satisfaction.



## **DEVELOPMENTAL CHANGES IN EXECUTIVE FUNCTIONING AND SOCIAL UNDERSTANDING DURING MIDDLE CHILDHOOD**

Primary Presenter: Arratia-Bedolla, Olivia

Secondary Presenter(s): Audrey Parzyk, Caryn Schmidt

Mentor Department: Psychology

Faculty Mentor(s): Prof. Alycia Hund

Author(s): Olivia Arratia-Bedolla, Kristin Gallaway, Audrey Parzyk, Caryn Schmidt

Executive functions are cognitive processes governing goal-directed behavior. Executive functioning is described as an umbrella term for three specific components: working memory, inhibitory control, and shifting abilities (Hill, 2004). First, working memory refers to memory that can process information and act on it. It is a functional form of memory that remains active and readily available. Second, inhibitory control manages distractions and impulse suppression to complete goal-oriented activities. Third, cognitive flexibility (shifting abilities) describes the ability to modify thinking when the situation changes and thinking about multiple concepts simultaneously. Each of these components is necessary to carry daily activities such as going to work, deciding what to wear, knowing to initiate or stop behaviors, and adjusting to change. For example, when children resist the temptation to grab a cookie sitting in an unattended cart they are demonstrating executive function. This ability to self-regulate and suppress the urge to act on impulse is essential for social interactions. As such, it is not surprising that there is a link between executive functioning and social understanding, especially understanding the self and others (i.e., theory of mind, Best et al., 2009). Executive functioning is associated with the pre-frontal cortex, and its development during childhood sets the stage for higher cognitive processes (Funahashi, 2001). Much research has focused on the development of executive functioning and social understanding during early childhood (Garon, Bryson, & Smith, 2008). Nonetheless, little is known about the development of these skills during middle childhood (Best & Miller, 2010).

The purpose of this study was to observe developmental changes in executive functioning and social understanding during the elementary years. Seven-through 11-year-old children completed tasks measuring executive functioning. Memory was measured via an object replacement task that involves remembering object locations. Inhibition was measured using a color word Stroop task. Shifting was measured through reading and spatial multiple classification card sorting tasks (MCCS) and a modified dimensional change card sorting task (DCCS). Theory of mind was measured using a second order false belief task. Ongoing work focuses on coding and analysis of data. We expect performance on executive functioning and theory of mind tasks will improve with age demonstrating developmental improvement across middle childhood. We also expect strong correlations between executive functioning and theory of mind scores. These findings would provide valuable insight regarding development during middle childhood.

## **UNDERSTANDING LAN PERFORMANCE**

Primary Presenter: Baird, Christopher

Secondary Presenter(s): Andrew Lester

Mentor Department: Information Technology

Faculty Mentor(s): Prof. Yongning Tang

Author(s): Christopher Baird, Andrew Lester

Each day, the Internet becomes a larger and larger part of daily life for both individuals and corporations. More and more tasks now take place online. For many local area network applications (e.g., course on line, voice over IP), real-time operation is expected and necessary. As such, it becomes imperative for a LAN to operate with satisfactory performance. To that end, we will be analyzing and presenting our findings on the performance of Ethernet network (the dominating LAN technology) using traffic patterns modeled after a number of the most popular LAN applications.

### **APPLE CINNAMON BRAN MUFFINS WITH OMEGA 3 FATTY ACIDS**

Primary Presenter: Barbier, Samantha  
Secondary Presenter(s): Laurie King, Carolyn Meyer, Allison Wright  
Mentor Department: Family and Consumer Sciences  
Faculty Mentor(s): Prof. Julie Schumacher  
Author(s): Samantha Barbier, Laurie King, Carolyn Meyer, Allison Wright

This study intended to determine the effects of different types of omega-3 additives on flavor, texture, and overall acceptability of apple cinnamon bran muffins. Three variations of the muffins were evaluated, including a control, a flax seed muffin, and a chia seed muffin. Results showed that the control muffin was rated substantially higher than the other two variations for flavor, texture, and overall acceptability. Although the control had higher scores, it was determined that the flax seeds and the chia seeds were acceptable additives in order to increase the amount of omega-3s in the muffins. Overall, these results emphasize the varying effects that omega-3 additives have on baked products and the importance of selection when using them as an ingredient in recipes.

### **PRESCHOOLERS AND PHYSICAL ACTIVITY**

Primary Presenter: Boczek, Mallery  
Secondary Presenter(s): Elena Granados, Kimberlee Lucchesi  
Mentor Department: Kinesiology and Recreation  
Faculty Mentor(s): Prof. Kristen Lagally  
Author(s): Mallery Boczek, Elena Granados, Kimberlee Lucchesi

As the prevalence of obesity is rising, researchers are examining physical activity levels in preschool children with the goal of developing interventions that will help prevent obesity as the children age. Our presentation will include an in-depth review of the existing research on physical activity levels in preschool children, and present the results of previous interventions that have been implemented with this age group. Additionally, the presentation will include the results of the planning and implementation of a physical activity workshop for children occurring on the ISU campus on March 1, 2013. Student authors will be responsible for the planning and implementation of physical activities for development of motor skills, balance, agility, cardiovascular endurance and muscular endurance, as well as learning activities to help children understand heart and muscle health, the importance of physical activity, and the problems associated with sedentary activities. Previous research will inform the choice of activities. The effectiveness of these activities will be analyzed and discussed.

### **ACQUIRING FOOD PREFERENCES FROM INTERACTION WITH RECENTLY FED CONSPECIFICS IN CONGENITALLY DEAF AND HEARING DOGS**

Primary Presenter: Borowski, Tim  
Secondary Presenter(s): Garrett Hartzell  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Valeri Farmer-Dougan  
Author(s): Tim Borowski, Garrett Hartzell

Domesticated pet dogs, obviously, are highly social creatures. Dogs are able to attend to and understand a variety of both human and other dog behaviors. However, a recent debate is whether these socialization behaviors developed as part of the complex socialization period, or are relatively inflexible, and perhaps innate. Using deaf versus hearing dogs, we are able to examine two groups with highly different socialization experiences. Deaf dogs, unlike hearing dogs, are unable to benefit from early experience regarding vocalized socialization skills, but otherwise appear to develop relatively normally. How deaf dogs compensate for the loss of vocalized cues during social interactions then provides a basis for understanding innate versus learned socialization patterns. An intriguing social behavior between dogs is snout-to-snout contact. While this behavior is not well understood, it appears that dogs transmit information regarding sources of food by licking each other's snouts (Lupfer-Johnson & Ross, 2007). The present investigation focuses on differences between deaf and hearing dogs as they respond to olfactory cues provided by a demonstrator dog. We predict that there will be greater snout contact by the deaf dogs, and the deaf dogs will

choose the food eaten by the demonstrator dog more frequently than hearing dogs. This is because deaf dogs must rely on alternative cues because of the lack of auditory input.

### **THE SENSORY AND OBJECTIVE EFFECTS OF SILKEN TOFU AND PEAR BABY FOOD AS EGG REPLACERS IN A MODEL CHEESECAKE SYSTEM**

Primary Presenter: Brkovic, Nikolina

Secondary Presenter(s): Liz Hamilton, Jessica Hubert, Constance Evans, Kelsey Iversen

Mentor Department: Family and Consumer Sciences

Faculty Mentor(s): Prof. Julie Schumacher

Author(s): Liz Hamilton, Jessica Hubert, Constance Evans, Kelsey Iversen, Nikolina Brkovic

Eggs are one of the most versatile and most used products in food production. The functions of eggs include coloring agent, emulsifier, texturizing and moisturizing agent, and leavening and thickening agent (McWilliams, 2012; Berkoff, 2012). The high proportion of proteins in the albumen and yolk of eggs are responsible for many of these properties.

Coincidentally, a growing number of people are suffering from an allergy to the protein in eggs. Because of the prevalence of eggs in food products, alternatives and substitutions for eggs have become a focus of much food science research. New products are being researched and developed but research is lacking for egg replacers that are currently readily available products that can be found in the home.

The purpose of this study was to determine the effects on tenderness, batter viscosity, taste, texture, and overall acceptability when silken tofu and pear baby food are substituted separately for eggs in cheesecake. Samples of the Control, Variation 1 silken tofu, and Variation 2 pear baby food were tested for by a group of students for taste, texture, and overall acceptability, by a line spread test for viscosity, and for cohesiveness by the Brookfield CT3 Texture Analyzer using a TA2/1000 30mmD, 60 degree cone attachment. After subjective and objective evaluations, it was determined that both silken tofu and pear baby food can be successfully substituted for eggs in cheesecake.

### **THE CONNECT MENTORSHIP PROGRAM: PROMOTING POSITIVE YOUTH DEVELOPMENT**

Primary Presenter: Budnick, Kimberly

Secondary Presenter(s): Jessica Stahl, Annie Leahy, Sabrina Roppo

Mentor Department: Psychology

Faculty Mentor(s): Prof. Gary Creasey

Author(s): Kimberly Budnick, Martin Gallegos, Jessica Stahl, Annie Leahy, Sabrina Roppo, Michelle Brown

The CONNECT Program involves pairing college students with middle school students attending high-need schools. The mentors tie their mentees to the collegiate experience, whereas mentees tie mentors to their school/community culture. Further, a collaborative community enhancement project is included and provides mutually beneficial effects—youth are often motivated to internalize the program goals if they perceive ownership in such experiences (Larson, 2006). Thus, participation was expected to influence the 5 elements of positive youth development (PYD) (e.g., character, confidence) and the 6<sup>th</sup> component, Commitment. Civic engagement commitment in the mentees and urban teaching intentions in the mentors were assessed.

#### **Method**

Sample: The CONNECT Program involves high need, middle schools that contain adolescents from low-income households. Whereas one school is ethnically diverse, the other schools contain either predominately African American or Latino adolescents. Each school partners with a community-based organization (CBO), which assists in community tours and enhancement capstones.

Procedures: The college students first visit their mentees for a “shadow day”. Next, weekly 20-minute SKYPE interactions are conducted over 9 months. Also, we encourage mentors to learn about the worlds of their mentees via “community mapping” queries. It is via these interchanges that the mentors/mentees develop ideas for the

enhancement project.

The mentors are transported to the schools again and shadow their mentees for a half-day and participate in a community tour. The mentees are next transported to the college for a visit. Finally, the mentors are transported to the mentees' communities to participate in the enhancement project.

### Results

Via survey, elements (e.g., competence, contribution) of the PYD framework were assessed. The mentees reported more confidence, competence and civic commitment. The mentees strongly endorsed items concerning commitment to attend college. Most improvement in the mentors concerned confidence in domains like ability to teach in an urban context and work with different cultural backgrounds. Further, the mentors reported greater understanding concerning integrating civic engagement in curriculum and reported commitment to teaching in an urban context.

### Discussion

The progress of PYD was noteworthy, and it was promising to observe strong commitment to college in the mentees and urban teaching intentions in the mentors. We also noted incidental findings: a number of the college students volunteered for events hosted by the partnering CBO. Our next step is to collect qualitative data to specify the program elements that contribute to PYD and motivation for civic commitment.

## **TEACHING INDIVIDUALS WHO WORK WITH CHILDREN WITH AUTISM: A COMPARISON OF THREE STRATEGIES**

Primary Presenter: Carlino, Madeline

Secondary Presenter(s): Audrey Parzyk

Mentor Department: Psychology

Faculty Mentor(s): Prof. Karla Doepke

Author(s): Madeline Carlino, Audrey Parzyk

This study is designed to test which form of training leads to the greatest acquisition of skill and knowledge in the areas of Autism Spectrum Disorders (ASD) and Discrete Trial Training (DTT). Three different training types will be compared: in-vivo, videotape and reading-only (information packets). Participants will be given pre- and post-tests to assess their knowledge of ASD and DTT as well as pre- and post-tests to assess skill development of DTT. From this study we will be able to shed light on which type of training is most effective for individuals and various employees at schools, clinics and companies working with individuals with ASD.

## **DEVELOPING IMITATION IN CHILDREN WITH AUTISM: A COMPARISON OF TWO STRATEGIES**

Primary Presenter: Chmielewski, Tara

Secondary Presenter(s): Jillian DiGiacomo, Krissa Victor

Mentor Department: Psychology

Faculty Mentor(s): Prof. Karla Doepke

Author(s): Tara Chmielewski, Jillian DiGiacomo, Joselyn Meissner, Krissa Victor

Autism Spectrum Disorder (ASD) is a pervasive developmental disorder with impairments in, both, communication and social interactions, as well as a restricted range of interests and repetitive behaviors (APA, 2000). Imitation is a means by which individuals copy another person's behavior, including both its physical properties and its connotation (Sevlever & Gillis, 2010). Imitation is important in learning and social interactions. Through the social use of imitation, typically developing infants acquire social communication skills that have been shown to be deficient in children with ASD (Ingersoll, 2008). Without these precursor imitation skills, children with autism often show deficiencies in social communication and interactions. This study directly compares the effects of two imitation training models – teacher-directed imitation training and child-directed imitation – on the development of spontaneous imitation ability, as well as effects on expressive language ability. Studies have shown that while teacher-directed imitation training in the form of discrete trial training is effective in increasing elicited imitation skills, child-directed imitation training has been shown to be more effective in increasing spontaneous imitation skills (Lovaas, Freitas, Nelson, & Whalen, 1967; Ingersoll, 2010).

Participants include children between the ages of three and twelve years old diagnosed with Autism Spectrum

Disorder (ASD) and who have not demonstrated spontaneous imitation skills. The current study uses a multiple baseline design to measure spontaneous imitation skills and expressive language skills over three subsequent conditions: a baseline condition, a teacher-directed imitation condition, and a child-directed imitation condition. It is hypothesized that participants will show an overall increase in both spontaneous imitation and expressive language skills, but will show a greater increase in both skills in the child-directed imitation condition. Results will be shown graphically.

### **THE EFFECTS OF VOCAL PERFORMANCE TECHNIQUES FOR RELAXATION ON STUTTERING- LIKE DISFLUENCIES**

Primary Presenter: Cleary, Molly  
Secondary Presenter(s): Morgan McCaslin  
Mentor Department: Communication Sciences and Disorders  
Faculty Mentor(s): Prof. Jean Sawyer  
Author(s): Molly Cleary, Morgan McCaslin, Emily Monteagudo, Jean Sawyer

The present study investigates the efficacy of an experimental treatment for stuttering. Proper breath support and relaxation are two key components of stuttering modification. Past research has shown positive results when incorporating breath and relaxation in therapy treatments for stuttering. The treatment used in this study was adapted from techniques developed by Kristin Linklater. These techniques emphasize breathing and relaxation to maximize the expressive capabilities for voice actors. Based on Linklater's work, this study focused on regulated breathing by interlocking relaxation, awareness, and breathing. Three adults who stuttered participated in the treatment study. Participants met with a graduate clinician for eight to twelve weeks for approximately 60-minutes per session. The study was structured as an ABAB design. Three baseline sessions were followed by four treatment sessions, and then a second set of three baseline sessions were followed by four treatment sessions. Sessions were audio recorded by the graduate clinician and transcribed by undergraduate students. Data was collected by transcribing orally read narrative passages and spontaneous speech during baseline and treatment sessions. Baseline and treatment transcripts were analyzed to measure stuttering-like disfluencies in baseline and treatment conditions. Stuttering-like disfluencies are typical of stuttered speech, and include part-word repetitions, single-syllable word repetitions, and disrhythmic phonation. Disrhythmic phonation includes blocks and prolongations. The speech samples were also analyzed for other disfluencies, which include interjections such as "like" and "um," phrase repetitions, revisions, multisyllabic word repetitions and abandoned utterances. Preliminary results from this study indicate participants were able to reduce these core behaviors of stuttering after participating in this treatment.

### **UNDERDEVELOPMENT IN THE KUKUMA REFUGEE CAMP**

Primary Presenter: Cousin, Jacob  
Secondary Presenter(s): Caleb Albo, Nicholas Mullins, John Rumbaugh  
Mentor Department: Politics and Government  
Faculty Mentor(s): Prof. Michaelene Cox  
Author(s): Jacob Cousin, Caleb Albo, Nicholas Mullins, John Rumbaugh

This project will consist of a close examination of one of the largest refugee camps in the East African region. The research required in analyzing developmental and humanitarian issues and the causes for these issues will serve our team by granting us the perspective of a refugee of conflict in Kakuma Refugee Camp. We have selected to research this particular refugee camp because it is one with many issues relating to infrastructure, water shortage, conflict, and many other humanitarian issues, whose refugee population continues to climb upward. Initially established in 1992 to serve Sudanese refugees displaced from war or persecution, the camp is now home to refugees from a myriad of different African regional conflicts. Internal issues at Kukuma Refugee camp include radicalism, ethnic and religious conflict, dangerous living conditions, and much more. Diseases such as malaria have also been a major problem within Kukuma Refugee Camp. Difficult access to safe drinking water has made every day living a challenge for those living within the camp. With our research, we will find the cause of these major developmental and humanitarian issues and why they are still prevalent today.

### **LOW SODIUM WHITE MACARONI AND CHEESE FOR CHILDREN**

Primary Presenter: Daniels, Emelia  
Secondary Presenter(s): Jessica Fink  
Mentor Department: Family and Consumer Sciences  
Faculty Mentor(s): Prof. Julie Schumacher  
Author(s): Emelia Daniels, Jessica Fink, Cristina Pronove

In order to lower sodium intake, particularly in children, the researchers manipulated ingredients in a control recipe of macaroni and cheese to include lower sodium substitutes. The research questions that led this study included 1) Is there a statistically significant difference in the desired sensory properties of flavor, mouthfeel, and overall acceptability for macaroni and cheese made with a 50% substitution of lower sodium butter, cheese, and rice milk, and a 100% substitution of lower sodium butter, cheese, and rice milk? and 2) Is there a statistically significant difference in the desired objective variables of viscosity and adhesiveness for macaroni and cheese made with a 50% substitution of lower sodium butter, cheese, and rice milk, and a 100% substitution of lower sodium butter, cheese, and rice milk? The study was conducted with a convenience sample of 30 students at a large public Midwestern university. The researchers prepared three variations and presented participants with the product labeled with a three digit code on a paper plate for sensory evaluation. They then conducted objective tests using a texture analyzer and a line spread test to assess adhesiveness and viscosity respectively. The findings revealed a statistically significant difference in the flavor and acceptability of the final products; however, the flavor among all three of the macaroni and cheese variations failed to produce any statistically significant results. Based on the outcome of the experiment, a 50% substitution of lower sodium butter, cheese, and rice milk were acceptable modifications for flavor, mouthfeel, and overall acceptability.

Keywords: macaroni and cheese, sodium, children

### **SELF PERCEPTION RATINGS OF TEACHERS OF THE DEAF, SPEECH LANGUAGE PATHOLOGISTS, AND AUDIOLOGIST RELATED TO SERVING YOUNG CHILDREN WITH HEARING LOSS**

Primary Presenter: Davidson, Jamie  
Secondary Presenter(s): Anna Tess  
Mentor Department: Special Education  
Faculty Mentor(s): Prof. Maribeth Lartz  
Author(s): Anna Tess, Megan Liddell

Pre and post self-perception ratings were compared for three groups of professionals: teachers of the deaf, speech language pathologist, and audiologist related to 0-3 services with children with children with hearing loss, working with families and cochlear implants and other assistive devices.

### **SATISFACTION OF VOLUNTEERS**

Primary Presenter: Dawson, Laura  
Secondary Presenter(s): Kailyn Russell  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Kimberly Schneider  
Author(s): Laura Dawson, Kailyn Russell

Over the last few months, the Volunteer Program Assessment research group within the Psychology Department has examined the satisfaction of volunteers working in Humane Society organizations by conducting Volunteer Program Assessments. Working together with researchers and faculty from the University of North Carolina Charlotte, we administered an online survey of volunteers at a Humane Society in Boulder, Colorado. The survey focuses on a multitude of factors such as Satisfaction with Communication, Organizational Commitment, Role Ambiguity, and Satisfaction with Paid Staff. The volunteers rated their satisfaction and also included responses to open ended questions focused on their satisfaction with the organization and their satisfaction with their volunteer activities. Previous research on dimensions of job satisfaction, burnout, and job constraints has focused almost entirely on examining experiences of paid employees. Given the possibility that volunteers are working at animal shelters for

very different reasons than paid employees, we were interested in examining how their experiences and satisfaction may differ from paid employees.

The Boulder Valley sample included 258 volunteers, who on average had volunteered at the animal shelter for 1-2 years. Out of the 258 respondents, 236 were currently active volunteers while 22 were inactive. Most of the volunteers in this sample (53%) volunteered at the shelter weekly. The survey results from this sample indicated that volunteers were highly satisfied with their volunteer work, organizational commitment and competence, with 95% or more of volunteers responding agree or strongly agree. They were less satisfied with perception of voice and engagement, but the overall satisfaction of the volunteers at the animal shelter was very high.

More recently, we have started surveying volunteers at Homeward Pet Adoption Center in Seattle. Data collection is ongoing for this project, and I will be looking at combined data from both the Seattle and Boulder volunteer organizations. For the current study, I plan to analyze the relationship between perception of voice and burnout for volunteers. I hypothesize that these two constructs will be significantly negatively related such that volunteers who feel they have input and voice in the organization will report lower levels of burnout symptoms. I also plan to examine whether satisfaction with communication predicts organizational constraints.

### **SPATIAL LANGUAGE DURING THE PRESCHOOL YEARS: MEASUREMENT ISSUES AND POTENTIAL MECHANISMS OF CHANGE**

Primary Presenter: Domek, Samantha  
Secondary Presenter(s): Kaitlin Brady  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Alycia Hund  
Author(s): Samantha Domek, Kaitlin Brady

Communicating about locations is important in everyday life. For example, when a child is explaining to you exactly where she hid your car keys, she needs to be precise in her directions so you can find your keys and get to school and work on time. This important linguistic skill emerges during early childhood but improves over time. For instance, the first locative expressions to emerge for English language learners are in, on, under, and beside. These are followed by back, front, and between (Johnston & Slobin, 1979). Despite years of research, little is known about how and why the more challenging locative expressions develop. The overall goal of this project was to specify the development of locative expressions across early childhood by focusing on parent reports of their children's comprehension and production of spatial terminology and child comprehension and production. Sixty-three 3- to 5-year-old children (26 girls, 37 boys) participated. In the child language production task, children were asked to describe where a smiley face was located compared to other objects (i.e., squares) on the page for each of the 12 trials. In the child language comprehension task, the children were asked to draw X's in specific locations relative to squares on the page for each of the 12 trials. Twenty-seven parents completed a demographic form and a parent-report that measured child spatial language comprehension and production and

related activities. This form asked parents to indicate which of fourteen spatial words their child understood and used regularly. The last section asked parents to rate how often their child participated in activities related to spatial understanding, such as books, puzzles, blocks, games, videos, or songs. It then asked parents to list specific activities their children undertake that help facilitate spatial concepts. In general, we expect spatial language comprehension and production to improve with age. Moreover, we expect a strong relation between the parent reports and children's demonstration of production and comprehension of spatial terms, though we predict that comprehension will surpass production. Finally, although exploratory in nature, we anticipate a positive relation between children's involvement in play activities and their spatial language. Together, these findings will provide important information about the development of spatial language during early childhood.

## **SATISFACTION OF VOLUNTEERS IN HUMANE SOCIETIES AND THE CONNECTION BETWEEN COMMUNICATION AND ENGAGEMENT**

Primary Presenter: Elam, Michelle  
Secondary Presenter(s): Aaron Whitely  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Kimberly Schneider  
Author(s): Michelle Elam, Aaron Whitely, Kim Schneider

The majority of research focused on workplace experiences has examined paid employees. The Volunteer Program Assessment research group in the Department of Psychology recently undertook a project focused on volunteers' experiences within their organizations. A few studies of volunteer work examined why people choose to volunteer, whereas other studies focused on the perceptions of volunteers. According to research by Rogelberg et al., (2010) positive experiences of either volunteers or paid employees may positively impact the organization.

The current study will focus on volunteers' perceptions of the workplace. Volunteers completed an online survey that examined variables such as organizational commitment, recognition, various dimensions of satisfaction, perception of voice, competence, engagement, organizational constraints, burnout, and intention to quit. Ongoing data collection will be combined from data our research group recently collected from multiple Humane Society sites in Boulder and Seattle. We are interested in the relationships between satisfaction with communication, satisfaction with volunteer work, and engagement. We will also present themes evident from volunteers' responses to open-ended questions relevant to job satisfaction. We predict that satisfaction with communication will be positively correlated with satisfaction of volunteer work. It is also hypothesized that satisfaction with communication will have a positive correlation with engagement. In addition, we predict that engagement will positively correlate with volunteer satisfaction.

## **PRODUCTION AS PREDICTION DURING LANGUAGE COMPREHENSION**

Primary Presenter: Flessner, Nick  
Secondary Presenter(s): Jessie Bode  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Cooper Cutting  
Author(s): Nick Flessner, Jessie Bode

Our study looks deeper into language comprehension and language production. During conversation, speakers use their production system to produce language while listeners use their comprehension system to understand what is being said. However, it may be possible that both systems interact within individuals as well. In this investigation, we examine the possibility that the listeners may use their production system to predict what might be said next to facilitate comprehension. Our research looked for evidence as to determine whether the production system make predictions during comprehension. Data has been collected from 30 college students from Illinois State University. We ran a two -factor design for our study. Each participant listened to a recording on headphones of a person saying a sentence (ex. "The baby jumped over the chair") while watching an animation on a computer screen that would either match up or not match with what was being said over the headphones (e.g., a picture of a baby/dog moving across the screen over a picture of a chair). The participants were to attempt to immediately say out loud what they heard over the headphones as soon as they heard the beginning of the sentence ("shadowing" the recording). These utterances were recorded and transcribed. Experimental trials used pictures that had been previously normed to have clear dominant and subordinate "names." For example in these norms, the picture of the baby was typically called "baby" first, and "infant" was second. Our expectation was that if production processes are used to predict comprehension, then participants will predict the dominant name "baby." If the sentence that they hear and must shadow matches this prediction, then we expected fast and fluent shadowing. However, if they instead heard "infant" then the mismatch between the predicted "baby" and the presented "infant" would lead to slower, more disfluent shadowing. So our first factor was the match (dominant) / mismatch (subordinate) between what participants expected and what they heard. Our second factor was whether the critical object picture was located in the subject or the object position of the sentence. This was included to examine the potential impact of sentence position on prediction. Some limitations of our study included limited resources and the demographic levels the



students. Future research will provide us the opportunity to use different settings and new perspectives to combine previous studies with ours and open the world to new levels of psycholinguistics.

### **OPEN NONNEGATIVE MATRIX PROBLEM**

Primary Presenter: Franco, Alexander  
Secondary Presenter(s): Austin Buck, Justin Paggao  
Mentor Department: Mathematics  
Faculty Mentor(s): Prof. Gaywalee Yamskulna  
Author(s): Austin Buck, Alexander Franco, Justin Paggao, Gaywalee Yamskulna

In this work, we are interested in classification of nonnegative matrices that share the same rational canonical forms. The main tools of this study are matrix decompositions such as rational canonical forms, Jordan canonical forms, Schur forms, etc. We begin by using eigenvalues of diagonalizable matrices to classify matrices that share the same rational canonical forms. Next, we study the non-diagonalizable case. Precisely, we investigate matrices obtained from non-diagonalizable matrices by using various types of matrix decompositions. Also, we study reducible and irreducible matrices which are two important classes of matrices. These will provide an insight into such specific cases. The results of this work will be applied to the well-known open nonnegative inverse eigenvalue problems which have been around for seventy years.

### **USE OF THE CANINE-ALITY AND SAFER ASSESSMENTS AS BEHAVIORAL PREDICTORS TO DISTINGUISH DEAF AND HEARING AUSTRALIAN SHEPHERD DOGS (CANIS FAMILIARIS)**

Primary Presenter: Harper, Kelsey  
Secondary Presenter(s): Craig Teheny  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Valeri Farmer-Dougan  
Author(s): Kelsey Harper, Craig Teheny, Valeri Farmer-Dougan

Domesticated pet dogs, obviously, are highly social creatures. Dogs are able to attend to and understand a variety of both human and other dog behaviors. However, a recent debate is whether these socialization behaviors developed as part of the complex socialization period, or are relatively inflexible, and perhaps innate. Using deaf versus hearing dogs, we are able to examine two groups with highly different socialization experiences. Deaf dogs, unlike hearing dogs, are unable to benefit from early experience regarding vocalized socialization skills, but otherwise appear to develop relatively normally. How deaf dogs compensate for the loss of vocalized cues during social interactions then provides a basis for understanding innate versus learned socialization patterns. This project, then, empirically compares the behavioral traits and aggressive tendencies of deaf/low vision and typical Australian Shepherds who have been relinquished to the Australian shepherd Rescue Midwest organization. These dogs are relinquished at a variety of ages (newborn to elderly), and for a variety of reasons (financial, allergies, family moving, or behavioral difficulties). Approximately 25% of the dogs relinquished are so called lethal whites: dogs that are deaf, have low vision, or both. The project uses the ASPCA Canine-ality and Puppy-ality behavioral assessment instruments and the ASPCA aggression inventory to evaluate each relinquished dog. Results of these assessments will then be compared across deaf/low vision dogs and typical dogs. These data may provide some of the first empirical data examining different behavioral traits and sociability between deaf/low vision and hearing Australian Shepherds.

### **IS YOUR CHOICE MY CHOICE? OWNERS EFFECT ON PET DOGS (CANIS FAMILIARIS) PERFORMANCE ON A FOOD CHOICE TASK:**

Primary Presenter: Harper, Kelsey  
Secondary Presenter(s): Patrick Donlan  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Valeri Farmer-Dougan  
Author(s): Kelsey Harper, Patrick Donlan, Tim Borowski, Valeri Farmer-Dougan

Domesticated pet dogs, obviously, are highly social creatures. Dogs are able to attend to and understand a variety of both human and other dog behaviors. However, a recent debate is whether these socialization behaviors developed

as part of the complex socialization period, or are relatively inflexible, and perhaps innate. Using deaf versus hearing dogs, we are able to examine two groups with highly different socialization experiences. Deaf dogs, unlike hearing dogs, are unable to benefit from early experience regarding vocalized socialization skills, but otherwise appear to develop relatively normally. The project examines whether deaf dogs show increased visual attention or increased attention to human visual cues than typical dogs. Specifically, we examine whether deaf dogs will be more likely to respond to reputation-like inference (Kundely, et al, 2011). That is, deaf dogs will be as good, if not better, at identifying the human who is more likely to provide higher amounts of reinforcers than typical dogs. A second, intriguing, question is whether deaf dogs are more likely to attend to human cues regarding reward, and thus can be more easily fooled than hearing dogs.

### **AGGRESSIVE BELIEFS AND BEHAVIOR AT SCHOOL**

Primary Presenter: Harris, Lakeitta  
Secondary Presenter(s): Denisha Maddie  
Mentor Department: Psychology  
Faculty Mentor(s): Profs. Renée Tobin and Adena Meyers  
Author(s): Jennifer Engelland, Emily Morrow, Aundrea Lane, Lakeitta Harris, Denisha Maddie, Adena Meyers, Renée Tobin

Why are some children and adolescents more likely to behave aggressively? Research indicates that aggressive beliefs predict aggressive behavior in elementary students. Additionally, high quality school environment (i.e., climate) is linked to reduced behavior problems, and lower rates of bullying and victimization. The purpose of the present study is to extend this research by examining the relation between middle school students' aggressive beliefs and behavior as moderated by school climate. Participants included 263 middle school students in grades five through eight at four middle schools in a rural county in the Midwest. Middle school students completed the Normative Beliefs About Aggression scale (Huesmann & Guerra, 1997) and a school climate scale measuring students' sense of school as a community (Child Development Project, 2005). The majority (87%) of students in this sample reported engaging in at least one aggressive behavior in the past week. Endorsements of specific aggressive behaviors ranged from 11% (encouraging others to fight) to 69% (getting angry very easily with someone). Preliminary regression analyses revealed that students who perceived a sense of community at school were less likely to report frequent aggressive behavior than those with more negative views on school climate. No evidence of a significant interaction between aggressive beliefs and school climate on aggressive behavior was found. Together, aggressive beliefs and sense of school as a community accounted for 17% of the variance in aggressive behavior. Results will further be discussed in terms of prevention and intervention strategies for reducing aggression at schools.

### **ILLINOIS STATE UNIVERSITY TURNER HALL LED RETROFIT FEASIBILITY STUDY**

Primary Presenter: Hart, Adam  
Secondary Presenter(s) Jesse Massa, Matt Noehre, Dan Spethmann  
Mentor Department: Technology  
Faculty Mentor(s): Prof. Jin Jo  
Author(s): Adam Hart, Jesse Massa, Matt Noehre, Dan Spethmann

As energy consumption increases along with our growing student body, we will perform a feasibility study to assess the potential utilization of an LED retrofit at Illinois State University. We propose to upgrade the outdated fluorescent lighting within Turner Hall, with state-of-the-art, efficient LED tubes. Several other buildings on campus have received lighting system upgrades, and several more are scheduled for upgrades; Turner Hall is not included in any upgrade schedules. The purpose of this research is to report the economic feasibility, energy savings potential, and qualitative benefits of this proposal. Because lighting accounts for approximately 30% of ISU's annual energy usage, the exchanging of fluorescents to LEDs will not only significantly reduce energy consumption and building maintenance costs, but also lessen negative externalities. The goals for this project can be accomplished through comparison of expected life cycles of LED tubes and fluorescent tubes, an extensive cost/benefit analysis of LED tubes from various manufacturers, and an examination of similar projects. A final feasibility report will be generated and delivered to ISU's Offices of Sustainability and Energy Management.

## **INVESTIGATING THE PHENOMENON OF SPORE KILLING IN NEUROSPORA FUNGI**

Primary Presenter: Harvey, Austin  
Secondary Presenter(s): Kevin Sharp, Danielle Kuntz  
Mentor Department: Biological Sciences  
Faculty Mentor(s): Prof. Thomas Hammond  
Author(s): Austin Harvey, Kevin Sharp, Danielle Kuntz, David Rehard, Patrick Shiu, Thomas Hammond

In Mendelian genetics, two alleles of the same gene have an equal chance of being passed from parents to progeny. However, Mendel's laws do not apply when one of the alleles becomes selfish. An example of such selfish behavior can be observed in the fungus *Neurospora* during the phenomenon of spore killing. For example, when a *Neurospora* Spore killer strain is crossed to a non-Spore killer strain, half of the spores are killed during development. The only spores to survive are those which encode the genes that cause spore killing. Using a mutant screen and three point crossing assays, we have narrowed the location of one such 'spore killing gene' to a 155 kb portion of chromosome III.

## **THE EFFECT OF FAMILIARITY AND WORKING MEMORY ON DIRECTION GIVING AND WAYFINDING**

Primary Presenter: Hauptmann, Kassandra  
Secondary Presenter(s): Robert Wolter  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Alycia Hund  
Author(s): Kassandra Hauptmann, Robert Wolter

People regularly travel to and from various locations and provide or follow directions. While there is literature that provides a detailed background of wayfinding and direction preference, surprisingly little is known about the integration of direction giving with wayfinding performance. We know that familiarity plays a part in both wayfinding and direction giving (Hund & Nazarczuk, 2009). Cognitive processes such as working memory also have been shown to assist in wayfinding (Pazzaglia, Meneghetti, De Beni, & Gyselinck, 2010). The purpose of this research study was to understand the qualities that affect direction giving and wayfinding, especially familiarity and working memory. We expected that the more familiar participants were with the environment, the more descriptive directions those individuals would provide. In addition, we expected more effective wayfinding performance for participants who were more familiar with the environment, and for those with greater working memory. We predicted that participants as a whole would include more descriptive features when providing directions for an individual who is not familiar with the environment as compared to an individual who is familiar with the environment. Participants were 59 (24 male and 35 female) undergraduate students at a large public university. They were asked to provide directions to a fictitious listener who was familiar with the basement environment, to provide directions to another listener who was not familiar with the basement, and to locate a destination in the basement themselves. Participants repeated lists of numbers in backward order to assess working memory. The total number of features participants provided in their directions was entered into a one-way repeated measures Analysis of Variance (ANOVA) with familiarity as the repeated factor. This analysis yielded a significant main effect of familiarity, indicating that participants provided more information for unfamiliar recipients than for familiar recipients. In addition, correlational analyses indicated that as participants' familiarity with the environment increased, so did the number of descriptive features provided in directions. In addition, as working memory increased, errors during wayfinding decreased. These findings indicate that working memory and familiarity are both involved in wayfinding and direction giving.

## **CAMP GIHEMBE TROUBLES**

Primary Presenter: Higgins, Bridget  
Secondary Presenter(s): Aaron Michaud, Joseph Schachner, Jesus Fregoso  
Mentor Department: Politics and Government  
Faculty Mentor(s): Prof. Michaelene Cox  
Author(s): Aaron Michaud, Bridget Higgins, Joseph Schachner, Jesus Fregoso

We will research the current lifestyle of the occupants in the area. We will also research the reason behind the refugee camp; why is it there? This project will entail the aspects of education and the need for it in Gihembe. We, as a group, will reasearch ways to improve the living conditions in Gihembe. We will be researching information about the Gihembe camp, especially the members. We will be looking at the lifestyles of the refugees, determining camp problems(drug, alcohol addictions,lack of funding for educational purposes), and coming up with possible solutions to address current issues. We will be using the internet for research and we will also use information from the class textbook to incorporate international law and international realtions, as well as outside sorces from numerous libraries. We will incorporate photos of the general lifestyle among the occupants as well as an overlying map of the area of the refugee camp. If nations truly follow UN Resolutoins, then there would be more done for the children in refugee camos. In the Convention for Childs Rights, the UN drafted and ratified a UN Resolution for all children and it states in Article 22 of the resolution, children "receive appropriate protections and humanitarian assitance in the enjoyment of applicable rights set forth in the present Convention." And it has been stated that all children are in a safe enviroment and receive proper nutrition, but in the case of education, one classroom for 2,000 children is extremely inefficent. The UN needs to do more in creating resolutions to increase proper education for these children to grow up with, so that tey may have a successful future.

## **ISU DICTIONARY**

Primary Presenter: Hoover, Kelsey  
Secondary Presenter(s): Sareh Ricca  
Mentor Department: History  
Faculty Mentor(s): Prof. Tony Adedze  
Author(s): Kelsey Hoover, Sareh Ricca

Together Kelsey and I researched words and phrases that are culturally relevant to only ISU students and created an ISU Dictionary. Through this we were able to engage in the study of historical linguistics that will develop a more united pride among Illinois State Students.

## **OFFSHORE WIND'S POTENTIAL IN MITIGATING ELECTRICITY GENERATED FROM FOSSIL FUELS FOR NEW YORK CITY**

Primary Presenter: Janociak, Michael  
Secondary Presenter(s): Jon Uelsmann, Alex Thompson  
Mentor Department: Technology  
Faculty Mentor(s): Prof. Jin Jo  
Author(s): Michael Janociak, Jon Uelsmann, Alex Thompson

The State of New York has in place a Renewable Portfolio Standard which states that 29% of all electrical generation in the state must come from renewable sources by the year 2015. Also, regulations proposed in July of 2012 have set CO2 limitations to 925 lbs per megawatt-hour of electrical generation. With these standards in place, the state is actively seeking new ways to achieve these goals. We plan to assess the benefit and feasibility of harnessing favorable wind resources found off the coast of Manhattan through the development of offshore wind turbines. Wind speeds in this area reach upwards of 9.5 m/s , prospective sites could be very fruitful in wind energy production. We estimated potential electrical generation production and evaluated economic and environmental impact of the offshore wind farm development. Another option for New York would be to import renewable electricity from other sites in the Midwest or Quebec Canada area, through the use of High Voltage Direct Current (HVDC) transmission lines. Here we report the results of comparative analysis to explore feasibility of the offshore wind farm off the coast of Manhattan as compared to other alternatives to meet these goals of renewable generation, while also reducing environmental externalities.

## **NOISE INDUCED HEARING LOSS, THE HIDDEN HEALTH EFFECT OF BARTENDING**

Primary Presenter: Jeralds, Brandon  
Secondary Presenter(s): Logan Futris, Travis Fellers  
Mentor Department: Health Sciences  
Faculty Mentor(s): Prof. George Byrns  
Author(s): Brandon Jeralds, Logan Futris, Travis Fellers

Noise in any setting can be harmful to workers, whether it is in a manufacturing plant or a bar. Bars on a regular basis promote loud music; contain lots of people, and employees work long shifts. This study surveyed multiple bars in a college town to determine noise levels and how these levels can potentially damage bar employees' hearing. The data was collected using DuPont dosimeters. The study discovered noise levels differed among the establishments and over different days. Measurements included both total and projected doses. In several instances, total and projected dose exceeded both the Occupational Safety and Health Administration Hearing Conservation Act and the Permissible Exposure Limits criteria. Reportedly, employees were unaware of the effects of long term noise exposure. These results suggest that long term employment in college bars may negatively affect hearing.

## **DEAF OR HEARING STATUS AS A VARIABLE PREDICTING INDIVIDUAL AND SOCIAL LEARNING PERFORMANCE IN THE DOG (CANIS FAMILIARIS)**

Primary Presenter: Kaplan, Sasha  
Secondary Presenter(s): Kellie Swoboda  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Valeri Farmer-Dougan  
Author(s): Sasha Kaplan, Kellie Swoboda

Domesticated pet dogs, obviously, are highly social creatures. Dogs are able to attend to and understand a variety of both human and other dog behaviors. However, a recent debate is whether these socialization behaviors developed as part of the complex socialization period, or are relatively inflexible, and perhaps innate. Using deaf versus hearing dogs, we are able to examine two groups with highly different socialization experiences. Deaf dogs, unlike hearing dogs, are unable to benefit from early experience regarding vocalized socialization skills, but otherwise appear to develop relatively normally. How deaf dogs compensate for the loss of vocalized cues during social interactions then provides a basis for understanding innate versus learned socialization patterns. One of these critical behaviors is the ability to model behavior from either a human or another dog. Dogs that can imitate others are more likely to avoid punishers and find rewards. For example, if one dog in a household learns to open a door, soon the other dogs in the house are also able to repeat the behavior. This study examines whether deaf dogs are more attuned to both humans and another dog model during a barrier task. Initially, the dog must move around a barrier to find the toy on its own, and then after watching a human or dog model. We predict that deaf dogs will attend to a human providing the cue to move around the barrier at a higher rate than they will attend to another dog providing the cue.

## **EFFECTS ON QUALITY CHARACTERISTICS OF FAT AND SODIUM REDUCTION IN CHILI USING KONJAC GEL AND PROVESTA**

Primary Presenter: Kaplan-Shank, Rebecca  
Secondary Presenter(s): Elizabeth Mathes  
Mentor Department: Family and Consumer Sciences  
Faculty Mentor(s): Prof. Julie Schumacher  
Author(s): Tyler Farwell, Rebecca Kaplan-Shank, Elizabeth Mathes, Natalie Zanger

The aim of this study was to examine the effect of reducing fat and sodium on acceptability and other sensory and objective measures of a standard chili recipe. One Control and two Variation recipes were tested. The first Variation used lower-fat ground beef, ground turkey, and a konjac gel fat substitute, as well as Provesta-029 as a sodium replacer paired with reduced-sodium canned ingredients and increased spice and herb levels. The second Variation was identical except for using textured vegetable protein instead of ground turkey. Sensory testing was performed using a convenience sample (n=36) of university students. Sensory results indicated a significant negative impact on flavor and overall acceptability for both Variations, and a negative impact on texture for the second Variation. Despite the decreased scores, the first Variation was found to be on the "acceptable" end of the spectrum.

Suggestions for future studies include a larger number of variations with marginal changes, as the drastic reductions in fat and sodium in this study would not be required to earn “low fat” and “low sodium” labels, or to be healthful inclusions in heart-healthy therapeutic diets.

### **EFFECTS OF TASK INSTRUCTION AND RULE COMPLEXITY ON INDUCTIVE REASONING**

Primary Presenter: Kirk, Olivia  
Secondary Presenter(s): Ashley Boaz  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Steve Croker  
Author(s): Olivia Kirk, Ashley Boaz

Inductive reasoning is a fundamental component of scientific thinking. Induction can be implicit or explicit; implicit induction is unconscious and involuntary whereas explicit induction is conscious and voluntary. Zimmerman and Pretz (2012) found evidence for the implicit processing of stimuli on the balance-scale task. We investigated the effects of implicit vs. explicit strategy use and rule complexity on multivariable inductive reasoning with a computer-based task.

To evaluate the effects of task instruction and rule complexity, participants (N=274) made judgments about which of two cars presented on a computer screen would go faster. The cars differed with respect to five variables: color, shape, wheel size, tailfin, and tailpipe. Half the participants were given a complex rule and half were given a simple rule to discover. The complex rule was that sports cars were faster than SUVs, medium wheels were faster than small or large wheels, and presence of a tailfin slowed a sports car, but not an SUV. Color and tailpipe had no effect. The simple rule was that blue cars were faster than red cars. Participants in both rule complexity conditions were randomly assigned to the explicit or the implicit condition. Participants in the explicit condition were instructed to try to discover the rules governing speed whereas participants in the implicit condition made speeded intuitive judgments. Participants completed 300 trials. After each trial, feedback about accuracy was provided.

We analyzed reaction times as a manipulation check for whether the instructions to make quick decisions in the implicit condition were followed. Results confirm that participants responded more quickly in the implicit condition ( $p < .001$ ). A 2x2 ANOVA was conducted to test the effects of task instruction and rule complexity on accuracy of predictions. There was a main effect of rule complexity,  $F(1,270) = 6.17, p = .014$ , a main effect of task instruction,  $F(1,270) = 11.69, p = .001$ , and a rule complexity x task instruction interaction,  $F(1,270) = 7.38, p = .007$ .

These results suggest that an explicit strategy leads to better performance on simple problems than complex problems, but that no such advantage holds for an implicit strategy. These findings run counter to recent work showing an advantage for implicit processing of complex rules (Zimmerman & Pretz, 2012).

### **THE SPROUTS EARLY CHILDHOOD PROGRAM: RESULTS OF A PROGRAM EVALUATION**

Primary Presenter: Kirk, Olivia  
Secondary Presenter(s): Olivia Kirk, Katelyn McCabe, Christine Miller, Melissa Rittgers, Brooke Seaquist, Ashley Weppner  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Karla Doepke  
Author(s): Olivia Kirk, Katelyn McCabe, Christine Miller, Melissa Rittgers, Brooke Seaquist, Ashley Weppner

Early intervention programs have shown to be beneficial to children ranging in ages from 3 to 5 who are diagnosed with autism. Sprouts is an intensive service program that focuses on three main goals which include functional communication development, social skills development, and independence with functional routines. The staff consists of 7 to 9 clinicians per day that were evaluated by the researchers with the intention to find the effectiveness of the Sprouts program over a 9 month period. The current study evaluated how often the staff successfully implemented the Sprouts program components as outline in the program manual. We predicted that by evaluating and providing proper feedback to the Sprouts staff regarding components of the program will essentially benefit the progression of the children and program overall.

## **SOLAR CONVERSION EVALUATION OF BROWNFIELD SITES IN ILLINOIS**

Primary Presenter: Krail, Kameron  
Secondary Presenter(s): Thomas Radochonski  
Mentor Department: Technology  
Faculty Mentor(s): Prof. Jin Jo  
Author(s): Kameron Krail, Thomas Radochonski

There are thousands of Brownfield sites in the United States that are contaminated and unsafe for use by humans or animals. By converting “Brownfields to Brightfields” or installing Photovoltaic solar arrays on the property, you instantly improve a myriad of factors in the area. The construction of a Photovoltaic system on a brownfield site will produce clean energy, generate tax revenues, and put unutilized land to good use. Our project examined the various aspects in the evaluation of whether or not prospective Illinois brownfield sites would be optimal for conversion. We gathered data on ownership, contamination, costs, profits, electrical generation, and socioeconomic benefit. During the course of our project we contacted previous contractors and executives from Exelon city solar who have had experience in brownfield conversions. This research project will encompass all the evaluating factors of what goes into converting a brownfield site to a solar powered renewable energy facility. The outcomes of this study will provide insight as to what sites are optimal for renewable energy development.

## **THE STORY OF CAMP IFO: A STORY OF FAMINE AND WAR**

Primary Presenter: Leffler, Nathan  
Secondary Presenter(s): Mario Bovino, Michael Bovino, Jack Kielma  
Mentor Department: Politics and Government  
Faculty Mentor(s): Prof. Michaelene Cox  
Author(s): Mario Bovino, Michael Bovino, Jack Kielma, Nathan Leffler

We chose Camp Ifo due to several factors. Camp Ifo is the largest refugee camp in the world. Second, it is one of the oldest camps in the world. The camp turned 21 on April 14<sup>th</sup> 2012. It is relevant to world politics because many of these refugees are trying to escape the political instability of Somalia. They are, at the same time trying to survive what has been called the worst drought in 60 years. This drought has affected 9.5 million people throughout all of Eastern Africa. We will determine whether or not climate change has spawned this drought. We will also assess how the population has been affected by the drought. We will also look at how the drought has caused a strain on local resources, and what are the consequences of this strain. Along with the drought we are also going to take a look at the political instability in the region. We will look at the various causes of this instability, and how it might be resolved.

We will do a majority of our research online through various academic sources such as scholarly articles and various primary sources. We will analyze the information as a group and we expect to find that the political instability has limited the ability of the population to return to their homeland. We also expect to see that climate change has elevated the hostilities within the region also creating the poor conditions that many of these refugees are suffering in. Through various approaches, critical analysis, and various perspectives used in international relations such as, Marxist, constructionist, realist and various approaches we are going to pose questions of why the poor conditions are present.

## **AN EXAMINATION OF PHONOLOGICAL PROCESSING SKILLS BEFORE AND AFTER ENROLLING IN A PHONETICS COURSE: PRELIMINARY FINDINGS**

Primary Presenter: Leonard, Maggie  
Secondary Presenter(s): Ashley Lewand, Katie Affara, McKayla Ellsworth, Rachel Grewe  
Mentor Department: Communication Sciences and Disorders  
Faculty Mentor(s): Prof. Heidi Harbers  
Author(s): Heidi Harbers, Maggie Leonard, Ashley Lewand, Katie Affara, McKayla Ellsworth, Rachel Grewe

All undergraduate programs in communication sciences and disorders include a course in learning the English Phonetic Alphabet which assigns a symbol to each sound in our language and transcribing speech using these symbols. To be successful in learning such knowledge and skills, students must attend to the sound structure of the

language (i.e., phonological awareness). This can be challenging to most students because a typical student has not paid attention to individual sounds since mastering reading and spelling in the early elementary grades. Van Riper and Smith (1979) refer to this as being “eye-minded” rather than “ear-minded.” Adults give minimal attention to the particular sounds in an overall message because of our rapid and automatic processing abilities. For adult students enrolled in a course in which they are faced with the task of attending to individual sounds in words in order to learn a new symbol, attention needs to shift from the visual system back to the auditory and kinesthetic characteristics of those sounds (Harbers, 2013). This shift poses a variety of challenges to adult learners.

Phonological awareness skills (i.e., one’s ability to attend to the sound structure of words) are contributing factors in students’ success (or difficulty) in learning phonetic transcription skills (Hall—Mills & Bourgeois, 2008; Harbers, Maher, Dhom, & Erwin, 2003; Moran & Fitch, 2001; Robinson, Mahurin, & Justus, 2011). The contribution of phonological working memory (i.e., the ability to keep sound information in memory long enough to complete a task) to phonetic transcription skills needs to be researched as well due to the fact that both phonological awareness and working memory skills are components of phonological processing.

This poster presents data pertaining to the first phase of the study. It presents the data pertaining to the phonological awareness and memory skills of college students before enrollment in a phonetics course. The research questions addressed include:

- What are the phonological awareness and memory skills of students before enrolling in a phonetics course?
- Is there a relation between phonological awareness and memory skills before enrollment in a phonetics course?
- Is there a difference between phonological awareness and memory skills when using real and nonwords?

### **COMPARISON OF MODESTY IN FASHION ADVERTISEMENTS THROUGHOUT THE DECADES**

Primary Presenter: Levi, Danielle  
Secondary Presenter(s): Erin Cotter, Aubrey Kalchbrenner  
Mentor Department: Family and Consumer Sciences  
Faculty Mentor(s): Prof. Ui-Jeen Yu  
Author(s): Danielle Levi , Caitlin Hanselmann, Erin Cotter, Aubrey Kalchbrenner , Ui-Jeen Yu

Over the past fifty years, the acceptance of immodest dress in fashion advertisements has grown. It has become socially acceptable to photograph women and men in advertisements where they wear clothing that barely covers their bodies. Modesty has continued to evolve in the media over time. The purpose of this study was to examine the changes in modesty depicted by fashion magazines over the past 50 years. The following research questions were addressed in this study: (1) How has modesty changed over the past 50 years? (2) Does modesty vary, based on gender? and (3) How does modesty vary, depending on the type of product advertised? A content analysis was conducted regarding 144 fashion ads published in Vogue magazine from 1960 to 2010. Findings from this study showed fashion advertisements in Vogue have changed in modesty throughout the decades. The current ads showed less modesty than ads from the past. More current ads displayed models with exposed legs, hips, stomach, arms, and upper body. Ads in the 2000s showed a large number of nude models with the lowest modesty scores. Ads in the 2010s had more modest models compared to the 2000s, but the positioning of the models appears more sexual. The ads of model’s modesty vary, depending on gender. More female models of immodesty were advertised in Vogue and a sexual immodesty was more likely placed on male models in the more recent decades. Ads for outerwear, jewelry, and fragrances had an increase in immodesty as time progressed. This study explored the content of Vogue magazine during the past fifty years to determine a representative change of modesty in the magazine. The results support a noticeable change of modesty in fashion advertisements. Implications for future research on modesty are discussed.



## **RELATIONSHIPS BETWEEN PARENTS AND EMERGING ADULT COLLEGE STUDENT ADJUSTMENT**

Primary Presenter: Madden, Brianne  
Secondary Presenter(s): Elizabeth Stefan  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Patricia Jarvis  
Author(s): Brianne Madden, Elizabeth Stefan

Emerging adulthood is a newer developmental stage in which young adults navigate into the world of adulthood to achieve autonomy and identity in life in general, and in relationships in particular (Arnett, 2000). Parents may play a pivotal role in supporting their adult child as they achieve adult status broadly and search for careers in particular (e.g., Seginer, Vermulst, & Shoyer, 2004). While many researchers have considered parenting of children and adolescents (e.g., Belsky, 1984, Baumrind, 1971), few scholars have examined other parenting variables with regard to emerging adult children. Following transactional models of development, parents and children may reciprocally influence one another. This research considers the congruence of perceptions of parents and their adult child following this theory. We also seek to capture the challenges of parenting adult children who are not fully autonomous although they are living away from parents while at college. College students (n = 100) will be asked to complete measures of adjustment to college and measures will be sent to their parents to complete as well. Both students and their parents will be asked about challenges in their relationship and about the college student's adjustment to college and future orientation. Measures will include standard background information as well as questions about contact/closeness between the parent and the student, an assessment of emotional autonomy, parental expectations, stressors, coping strategies, depressive symptoms, and student drug and alcohol use. It will be expected that parental variables will predict college student adjustment with coping serving as a moderator between parental stressors and adjustment variables. In addition, it will be expected that more congruent perceptions overall and greater family closeness will be associated with healthier relationships and better adjustment. This research has implications for understanding emerging adult adjustment broadly and college success in particular.

## **COLORFASTNESS OF SCREEN-PRINTED APPAREL COMPARED TO CARE LABEL**

Primary Presenter: Madden, Kelly  
Secondary Presenter(s): Megan Boston , Laura Leidig, Mollie Petersen  
Mentor Department: Family and Consumer Sciences  
Faculty Mentor(s): Prof. Ui-Jeen Yu  
Author(s): Kelly Madden, Megan Boston , Laura Leidig, Mollie Petersen, Jackie Carmichael, Ui-Jeen Yu

Screen-printing is a common technique for cloth printing by using a mesh screen, where dye or pigment paste penetrates the screen in selected areas only. It creates sharp-edged and multi-colored print designs. Widely used today on apparel products, the best example for screen-printing is graphic t-shirts. Screen-printed t-shirts have continuously been in high demand in the apparel market and are mass-produced in a rapid way. However, little has been investigated about whether the screen-printing method upholds the same properties as the original product during colorfastness testing, as well as whether the care instructions provided are appropriate to avoid any loss or transfer of color during laundering or usage. Thus, the purpose of this study is to examine colorfastness of screen-printed apparel compared to the care label. Two black 100% cotton t-shirts with the same single jersey structure—one non-printed and one screen-printed—were used. The care label for the screen-printed t-shirt included “turn inside out, machine wash, cold with like colors, only non-chlorine bleach when needed, tumble dry low, low iron if needed, do not iron decoration.” The standard test methods were completed: AATCC 61-2006 Colorfastness to Laundering, AATCC 8-2005 Colorfastness of Crocking, and AATCC 119-2004 Color Change due to Flat Abrasion (Frosting). Results indicate no color loss and color staining resulting from detergent and abrasive action of five home launderings for both the screen-printed and unprinted specimens. Regarding colorfastness of crocking, there was more color transferred from the screen-printed specimen than from the unprinted one to the white test cloth in dry tests. Both the screen-printed and the unprinted specimens had color transfer on the white test cloth by rubbing in wet tests. Besides, the screen-printed specimen showed a greater change in color, due to the flat abrasion in comparison to the unprinted specimen. Screen-printed t-shirts can be expected to withstand frequent laundering, but is very likely to transfer color onto other garments by rubbing and change color by flat abrasion with other materials.

This study suggests more in-detail care instructions should be added to the label for screen-printed apparel products to prevent color transfer or color change, due to rubbing and flat abrasion.

### **ON THE SYMMETRIC NONNEGATIVE EIGENVALUE PROBLEM**

Primary Presenter: Matousek, Sarah  
Secondary Presenter(s): Margaret Kopp, Jacqueline Morrison  
Mentor Department: Mathematics  
Faculty Mentor(s): Prof. Gaywalee Yamskulna  
Author(s): Margaret Kopp, Sarah Matousek, Jacqueline Morrison, Gaywalee Yamskulna

The symmetric nonnegative eigenvalue problem concerns the necessary and sufficient conditions for a set of  $n$  real numbers to be the eigenvalues of symmetric nonnegative matrix of order  $n$ . This problem is open for the case when  $n$  is greater of equal to five.

In this work, we first investigate the relationship between nonnegative matrices and symmetric matrices. Precisely, we classify the nonnegative matrices that are similar to symmetric matrices. This classification answers the question asking by W. Junliang in his paper "On the Realizability of Open Nonnegative Inverse Eigenvalue Problems, Applied Mathematics Letters 25(2012) 907-913" regarding the similarity of nonnegative symmetric matrices.

Next, we use the above information along with matrix decompositions to study the similarity of nonnegative matrices and symmetric nonnegative matrices. Such similarity will help us tackle the symmetric nonnegative eigenvalue problems for  $n$  is greater than of equal to five.

### **HOW DOES THE TOPIC OF DISCUSSION AFFECT INTERPERSONAL OUTCOMES?**

Primary Presenter: Miller, Christina  
Secondary Presenter(s): Samantha Helms, Heather Gilbert, Samantha Travers, Juliet Vogel, Brittany Weber  
Mentor Department: Sociology and Anthropology  
Faculty Mentor(s): Prof. Susan Sprecher  
Author(s): Susan Sprecher, Christina Miller, Samantha Helms, Heather Gilbert, Audrey Parzyk, Samantha Travers, Juliet Vogel, Brittany Weber

Why do some people get along the first time that they meet while others are indifferent or even express dislike? This is a research question that social psychologists have been studying for decades. One type of research used to address this issue is the face-to-face interaction process (strangers are placed in a room together for an initial interaction). A number of factors (e.g., level of disclosure) have been found to be associated with positive interpersonal outcomes in the initial interactions. In a study conducted in the fall of 2012 in the Social Interaction Lab at Illinois State University (directed by Dr. Susan Sprecher), we have examined two issues regarding initial interactions. First, we examined whether first interactions enhance mood. We measured our participants' positive and negative moods before and after 15-minute get-acquainted interaction. Second, we examined whether the randomly assigned topic of discussion in the interaction affects mood, enjoyment of interaction, and other interpersonal relationship phenomena. Participants were randomly assigned to discuss either political views (this was before the fall Presidential election), hobbies and interests, or to "just become acquainted". Sixty-four female-female pairs and 18 male-female pairs interacted in our study. Results indicated that interaction leads to the enhancement of positive mood and the decrease in negative mood. However, the participants' mood and other reactions to the interaction were not affected by the topic of discussion.

## **THE RHETORIC OF PASSING : AN ANALYSIS OF THE CROSS IN THE CLOSET**

Primary Presenter: Murphy, Jeremy  
Secondary Presenter(s): Joe Schemel, Kambria Vance, Becki McCorckle, Molly Mehochko, Raegan Larberg, Robi Mahan  
Mentor Department: Communication  
Faculty Mentor(s): Profs. Megan Koch and Jon Carter  
Author(s): Jeremy Murphy, Joe Schemel, Kambria Vance, Becki McCorckle, Molly Mehochko, Raegan Larberg, Robi Mahan

John Howard Griffin, a Caucasian Texan, artificially blackened his skin to appear African American. The 1961 book *Black Like Me* follows his travels through the segregation-era South to challenge race relations. Inspired by Griffin, 26-year old Timothy Kurek decided to embark on a similar journey. But while Griffin had to spend hours under an ultraviolet lamp and take large doses of a skin-altering drug, Kurek who identifies as straight, and was raised a devout Evangelical Christian, just had say two words – “I’m gay.” Beginning in 2009, Kurek decided to undergo a social experiment, living as a gay man for an entire year. However, he chose not to engage in any sexual activity, and noted in his book that he didn’t change his behavior, dress, or talk. He simply identified as gay. He saw this as an opportunity, not only to understand the individuals who his local Nashville church told him were abominations, but also to hopefully bridge the gap between the Christian and LGBTQ communities. While some see his project and subsequent book, *The Cross in the Closet*, as a revolutionary effort to open communication between two groups that are often seen as rhetorically incompatible, others argue that his deception undermines the ethos of his campaign. Considering this tension between good intentions and honesty we must ask the research question: How does building a message on deception alter efforts to develop understanding across cultures? To answer this, we turn to Jeffrey Bennett’s essay, “Passing, Protesting, and the Arts of Resistance: Infiltrating the Ritual Space of Blood Donation,” published in the February 2008 *Quarterly Journal of Speech*. Because Bennett examines how the process of hiding one’s identity (or passing) can be used to challenge social norms, it is ideal for our analysis of Kurek’s false coming out. To fully understand this project, we will examine Bennett’s essay, then apply it to Kurek’s project, before finally drawing some rhetorical implications.

## **CENTRALIZED RESIDENTIAL SOLAR PV SYSTEM FOR COMMUNITY ELECTRICITY GENERATION IN BLOOMINGTON, ILLINOIS.**

Primary Presenter: Piehl, Nicholas  
Secondary Presenter(s): Brian Peterson, Zach Priestley, Josh Bertolet  
Mentor Department: Technology  
Faculty Mentor(s): Prof. Jin Jo  
Author(s): Nicholas Piehl, Brian Peterson, Zach Priestley, Josh Bertolet

Community-scale electric generation is a complicated, yet unique approach to becoming a more sustainable society. By incorporating centralized, photovoltaic generation into neighborhood design and construction in central Illinois, we will be able to solve many problems such as meeting Illinois Renewable Portfolio Standards, reducing resident's carbon footprint, strengthening our infrastructure, and economy. Using simulation and analytic models, we have determined the proper size PV system to sustain the base electric load for a neighborhood of 100 homes in Bloomington, Illinois. By comparing this system with conventional fossil fuel sources of energy, as well as applying policies in theory and in practice, we can establish the realized costs and benefits to the residents and state of Illinois. Also, by establishing a working model in a state like Illinois, a "non-optimal" state for solar production, we can provide information to policymakers as well as the general public that the benefits of solar energy can be realized anywhere with the proper design.

## **AN OVERVIEW OF THE IMMUNOLOGY IN A NORMAL PREGNANCY FROM THE CLINICAL LABORATORY PERSPECTIVE**

Primary Presenter: Rich, Kaleigh  
Secondary Presenter(s): Sydney Condon  
Mentor Department: Health Sciences  
Faculty Mentor(s): Prof. Beverly Barham  
Author(s): Kaleigh Rich, Sydney Condon, Beverly Barham

Pregnancy involves many changes in the immune system from both a maternal and fetal perspective. The immune response during a normal pregnancy is a complex set of events. This is an overview of the expected changes that occur at various times throughout the gestational period, addressing both the humoral and cellular aspects of the immune system response during a normal pregnancy and how those responses would be measured in the clinical laboratory.

## **TOWARD THE TOTAL SYNTHESIS OF MUIRONOLIDE A**

Primary Presenter: Roche, Sydney  
Secondary Presenter(s): Erin M. Mortimer  
Mentor Department: Chemistry  
Faculty Mentor(s): Prof. Andy Mitchell  
Author(s): Sydney C. Roche, Erin M. Mortimer, Courtney E. Shaner, Andrew T. Mitchell

Muironolide A was isolated from the same marine sponge that gave phorboxazole A, an extremely potent bioactive natural product with potential anticancer properties. Unfortunately, only 90 µg of muironolide A was isolated and preliminary biological investigations showed moderate anticancer properties and possible antifungal properties. The total synthesis of muironolide A is the only viable means to obtain and evaluate this molecule since the marine sponge that delivered these natural products has never been re-isolated. The structure of muironolide A has been characterized and, through retrosynthetic cleavage, it can be broken down into three simpler molecules. After the synthesis of these building blocks, they will be connected through the Mitsunobu esterification, Horner-Wadsworth-Emmons olefination and marcolactonization reactions.

## **RADICAL FEMINISM AND THE CATHOLIC CHURCH: AN ANALYSIS OF POISONED WELL RHETORIC**

Primary Presenter: Rohman, Brian  
Secondary Presenter(s): Cole Moriarty, Bobby Bobbitt, Gabby Avila, Marissa Gallas, Tom Forrest, Hananiah Wiggins  
Mentor Department: Communication  
Faculty Mentor(s): Profs. Megan Koch and Jon Carter  
Author(s): Brian Rohman, Cole Moriarty, Bobby Bobbitt, Gabby Avila, Marissa Gallas, Tom Forrest, Hananiah Wiggins

Catholic nuns are typically characterized by their overall do-good nature and strict enforcement of behavior in orphanages, but are rarely associated with the terms "Radical" or "Feminist." Recently, however, the Vatican concluded a four-year investigation of the Leadership Conference of Women Religious, a group of nuns that represents eighty percent of all nuns in the United States, and found that these nuns were guilty of supporting Radical and Feminist themes - support of gay marriage and contraception - and declared "incompatible with church doctrine." Despite the fact that the personal stances of the majority of American Catholics aligns with LCWR, the organization agreed to negotiate their position to remain in the Catholic Church. Because the Church used a simplistic argument to diminish the credibility of the LCWR, and gain their compliance, we pose the research question: How does the label of Radical Feminism function within modern American Religious Discourse? To answer this, we will turn to Ben Kotzee's article "Poisoning the Well and Epistemic Privilege" as published in the August 2010 issue of Argumentation. Kotzee discusses the rhetorical technique known as "poisoning the well" and whether it is a valid argumentative tool or unethical technique to manipulate the rhetorical situation. This article is an ideal lens to analyze the Catholic Church's tactics against the LCWR. To better understand this rhetorical technique, we will explore Kotzee's model, apply it to the Church's rhetoric, before drawing implications regarding the nuns that are too radical for the Pope to handle.

## **THE ECONOMIC FEASIBILITY OF BIO-CHAR PRODUCTION FROM UPDRAFT GASIFIER INSTALLATION ON ILLINOIS ORGANIC FARMS**

Primary Presenter: Roubal, Thomas  
Secondary Presenter(s): Kyle Cadagin, Kyle Zomick  
Mentor Department: Technology  
Faculty Mentor(s): Prof. Jin Jo  
Author(s): Thomas Roubal, Kyle Cadagin, Kyle Zomick

The overuse of Illinois agricultural land is leading to a downward trend of crop yield in Illinois. The application of bio-char will reduce the amount of field inputs while addressing the removal of infected Illinois Ash trees in an environmentally beneficial way. An updraft gasifier capable of producing 200,000 BTU of heat energy will allow conversion of feedstock to Bio-char on location while decreasing transportation needs. In addition to bio-char, the secondary product is heat, which will be used in place of propane to heat and dry grains in a grain dryer. To accomplish this, we determined how much the application of bio-char will improve crop yields. We also acquired data from a grain drier located in Normal Illinois, showing how much propane they use and the annual cost in order to determine the difference when using a gasifier to dry the grain. Through this research project, we hope to show both the impact bio-char application has on crop yields, and how grain dryers can reduce costs by switching from propane to heat generated by the gasifier. Illinois forestry will benefit from decreased risk to tree population due to infestation, while Illinois agriculture will benefit from maximized yield outputs.

## **FEASIBILITY OF CONCENTRATED PHOTOVOLTAICS (CPV) VS. FLAT PLATE PV IN VARIOUS U.S. GEOGRAPHICAL LOCATIONS**

Primary Presenter: Shawgo, Michael  
Secondary Presenter(s): Brett Hodgdon, Ryan Waszak  
Mentor Department: Technology  
Faculty Mentor(s): Prof. Jin Jo  
Author(s): Michael Shawgo, Brett Hodgdon, Ryan Waszak

Renewable energy sources are needed to reduce the country's reliance on greenhouse gas producing fossil fuels. Many states have mandated Renewable Portfolio Standards to begin meeting this need. Photovoltaics are an option for producing this green energy. Concentrated Photovoltaic (CPV) systems are one of the newest commercially available PV technologies, yielding the highest cell efficiencies. The purpose of this research is to determine the feasibility of a CPV system in relation to a traditional Flat Plate PV system in various locations throughout the United States. We will conduct a feasibility study concerning the energy production, payback periods, and levelized cost of energy of each system. Any available government incentives will be included in the study. Based on this research, we will be able to recommend which regions CPV installations should be pursued.

## **RELATIONSHIPS BETWEEN PARENTS AND EMERGING ADULT COLLEGE STUDENT ADJUSTMENT**

Primary Presenter: Stefan, Elizabeth  
Secondary Presenter(s): Brainne Madden  
Mentor Department: Psychology  
Faculty Mentor(s): Prof. Patricia Jarvis  
Author(s): Brainne Madden, Elizabeth Stefan

Emerging adulthood is a newer developmental stage in which young adults navigate into the world of adulthood to achieve autonomy and identity in life in general, and in relationships in particular (Arnett, 2000). Parents may play a pivotal role in supporting their adult child as they achieve adult status broadly and search for careers in particular (e.g., Seginer, Vermulst, & Shoyer, 2004). While many researchers have considered parenting of children and adolescents (e.g., Belsky, 1984, Baumrind, 1971), few scholars have examined other parenting variables with regard to emerging adult children. Following transactional models of development, parents and children may reciprocally influence one another. This research considers the congruence of perceptions of parents and their adult child following this theory. We also seek to capture the challenges of parenting adult children who are not fully autonomous although they are living away from parents while at college. College students (n = 100) will be asked to complete measures of adjustment to college and measures will be sent to their parents to complete as well. Both

students and their parents will be asked about challenges in their relationship and about the college student's adjustment to college and future orientation. Measures will include standard background information as well as questions about contact/closeness between the parent and the student, an assessment of emotional autonomy, parental expectations, stressors, coping strategies, depressive symptoms, and student drug and alcohol use. It will be expected that parental variables will predict college student adjustment with coping serving as a moderator between parental stressors and adjustment variables. In addition, it will be expected that more congruent perceptions overall and greater family closeness will be associated with healthier relationships and better adjustment. This research has implications for understanding emerging adult adjustment broadly and college success in particular.

### **FAMILY ASSESSMENT PORTFOLIOS: PARENT AND EDUCATOR PERCEPTIONS**

Primary Presenter: Talbot, Samantha  
Secondary Presenter(s): Ashley Dolce, Marlee Goldsworthy, Felicia McGuinn  
Mentor Department: Special Education  
Faculty Mentor(s): Prof. James Thompson  
Author(s): Samantha Talbot, Ashley Dolce, Marlee Goldsworthy, Felicia McGuinn

Family Assessment Portfolios (FAPs) are multimedia materials that university students created with parents of children with developmental disabilities who were preparing for the transition to Kindergarten. To assess the value of FAPs, surveys and structured interviews were completed with parents and the children's future Kindergarten teachers. This presentation will provide information on how to create FAPs and share findings regarding parent and educator perceptions of the usefulness of the materials.

### **EXPLOSIVE HIGHLIGHTS: THE RHETORICAL IMPACT OF TEACHING MOLOTOV COCKTAILS TO KIDS**

Primary Presenter: Tenerelli, Joe  
Secondary Presenter(s): Tom McCarty, Kim Fisher, Maggie Butzen, Ayanna Guzman, Alissa Wicklein, Laura Balinski  
Mentor Department: Communication  
Faculty Mentor(s): Prof. Megan Koch  
Author(s): Joe Tenerelli, Tom McCarty, Kim Fisher, Maggie Butzen, Ayanna Guzman, Alissa Wicklein, Laura Balinski

While most of us associate children's magazines with coloring, hidden objects, and the dentist, for children in Tunisia these magazines offer a bit more bang. Russia Today reported on October 9th 2012, the October issue of popular Tunisian children's magazine "Kaws Kouzah," detailed step-by-step instruction of how to make a Molotov cocktail. It went on to explain that a Molotov cocktail is a home-made weapon which consists of a glass bottle and a folded cloth dipped in flammable liquid and is often used by revolutionaries to set fire to police, troops and tanks. Considering this magazine, whose main readers are kids mostly boys age 5 – 15, is providing step-by-step instructions on how to be a revolutionary, in a country that has just gone through a major revolution, further insight into the rhetorical values created by this article is warranted. Thus, we ask the research question: how does imposition of revolution in rhetoric for children alter representations of national character? In order to discover the answer, we must examine the Ross Collins article, "This Is Your Propaganda, Kids: Building a War Myth for World War I Children" from the Spring 2012 edition of Journalism History. Because Collins outlines how children's literature can use militaristic messages to alter their relationship with their country, it is ideal for our analysis of Kaws Kouzah's Molotov cocktail rhetoric. To effectively understand the impact of teaching kids how to take out tanks, we will analyze Collins' model, then apply it to the magazine in Tunisia, before finally bringing out some implications of this explosive kiddie cocktail.

## **CONTENT ANALYSIS OF MEDIA'S PORTRAYAL ON GENDER ROLE AND GENDER IDENTITY IN TEEN'S FASHION AND LIFE MAGAZINES**

Primary Presenter: Vavruska, Kaitlyn  
Secondary Presenter(s): Rachel Parker, Annie Kuan  
Mentor Department: Family and Consumer Sciences  
Faculty Mentor(s): Prof. Ui-Jeen Yu  
Author(s): Kaitlyn Vavruska, Rachel Parker, Annie Kuan, Elise Anderson, Ui-Jeen Yu

Previous studies indicated media tend to present women's stereotypical gender roles, such as being dependent upon men, primarily in the home setting, and preoccupied with physical attractiveness as a sexual object or decoration for men. The purpose of this study was to examine media's presentations of gender role and identity in teen magazines targeting young female adolescents and to determine the changes of stereotypical gender roles and identities from previous research. Based on Kaiser's (1997) agonic/hedonic gender role dichotomy, three researching questions were developed: (1) Are advertisements in teen magazines more agonic or hedonic? (2) What are the main messages of gender role in teen magazines? and (3) Do the advertisements lean towards feminine or masculine model images when addressing gender identity? A content analysis was conducted, using teen's fashion and life magazines. A total of 227 full-page ads were collected from Teen Vogue, Seventeen, and Girls Life published in 2012. Findings show the teen's fashion magazines presented more hedonic gender roles focusing on physical appearance, attractiveness, dependence, and heterosexual attraction, while the teen's life magazine reflected more agonic gender roles, such as achievement, independence, conquest over others, and expertise. Both fashion and life magazines for teen adolescence mainly depicted feminine gender identity along with the emphasis of fashion and beauty advertisements. This study suggests more variety of gender roles and identities in these magazines for young girls self-development is needed to avoid stereotypical gender roles and identities.

## **THE WORLD'S TOUGHEST REFUGEE CAMP**

Primary Presenter: Ventura, Patrick  
Secondary Presenter(s): Cherie Calimee, Andrew Lisowski, John Wisner  
Mentor Department: Politics and Government  
Faculty Mentor(s): Prof. Michaelene Cox  
Author(s): Cherie Calimee, Andrew Lisowski, Patrick Ventura, John Wisner

Our group's thesis is how is the UNHCR addressing the human rights violations committed against the refugees in South Sudan? We selected to research this particular refugee camp because there is a lot going on in this camp, including the hardships the refugees face in the camps and it is a hot button issue within the international community. The Sudanese military has continually violated the human rights of their own people and that is why there is an increasing number of people who are fleeing to the Yida refugee camp. We plan on gathering relevant news articles and United Nations High Commissioner for Refugees (UNHCR) documents to analyze what has specifically happened to the Sudanese, what the international community is doing to help the refugees, and what it is doing to stop the Sudanese military from continuing infringing on the Sudanese people's human rights. We expect to find why Yida is considered the world's toughest refugee camp and if there is any future improvements that will make this camp a safer place. Two of the illustrations we will incorporate into the project is a map of the surrounding conflict areas in relevance to the camp in South Sudan and Sudan and the other illustration will be a graph showing the influx population within the camp over the years.

## THE CURRENT CONDITION OF CAMP AIDA, THE STORY OF A PALESTINIAN REFUGEE CAMP

Primary Presenter: Weidner, Trevor  
Secondary Presenter(s): Marco Rodriguez, Brian Schick, Brett Simon  
Mentor Department: Politics and Government  
Faculty Mentor(s): Prof. Michaelene Cox  
Author(s): Marco Rodriguez, Brian Schick, Brett Simon, Trevor Weidner

The Current Condition of Camp Aida, The Story of a Palestinian Refugee Camp  
West Bank, Palestine

Due to the attention that Camp Aida has received from a papal visit in 2009, has the camp affected the legal and political status of the Palestinian nation?

Our interest was drawn to studying a Palestinian refugee camp because the ongoing Israeli/Palestinian conflict is one of the most controversial and talked about topics amongst the international community. We have assumed that Camp Aida will be interconnected to this conflict as well as the international law discussions that have occurred with the question of whether or not Palestine should be granted statehood. Covering an area of less than a square kilometer, Camp Aida, located near the West Bank of Palestine, has roughly 5,000 inhabitants. As a group, we collectively chose to study Camp Aida because of its rich history and influence on Palestinian life. We will first describe how the camp came into origin, and accurately depict the nature of within Camp Aida. We then aim to attain a better understanding of the effect that the relatively recent visit from Pope Benedict XVI has had on the camp. With the recent international acknowledgment of the Palestinian nation by obtaining observer state status in the United Nations, we look to find out if the daily life within Camp Aida has had an effect on the progression of Palestinian legal and political status. We will be studying recent Israeli military actions against the refugees within the camp, and what these attacks have meant in the big picture. Through the gathering of primary and secondary sources, we are determined to explain the daily life for refugees from within Camp Aida, and also if the camp has affected the status of Palestine in the international community, and if it has, to what degree. We will do all of this through the lenses of international law from the Palestinian perspective.

## SETA STRUCTURE AND FUNCTION IN THE COLEOCHAETALES

Primary Presenter: Wilson, Nicole  
Secondary Presenter(s): Matthew Trygg  
Mentor Department: Biological Sciences  
Faculty Mentor(s): Prof. Martha Cook  
Author(s): Nicole Wilson, Matthew Trygg, Tim Rockwell, Martha Cook

The green alga *Chaetosphaeridium* and its closest relative *Coleochaete* have distinctive sheathed hairs (setae) that grow at the top of their cells. The hair sheaths have thick walls and may be as tall as the cells, while the much narrower hairs are many times longer than the cells. Reports on the structure and growth of setae in *Coleochaete* are in conflict, and despite what is apparently a considerable amount of resources and energy involved in making these complex hairs, their function is not known. We are attempting to resolve the structure of sheathed hairs in *Coleochaete* and we are comparing structure of these hairs with those of *Chaetosphaeridium* (for which detailed hair structure and growth have not been previously reported). Thus far we have determined that in *Chaetosphaeridium* hairs are composed of cellulose, and grow from the base and that the single seta cell chloroplast may extend into the sheath. Two hypotheses for hair function have been proposed: herbivory avoidance and nutrient acquisition. Currently we are testing the hypothesis that the hairs function in nutrient acquisition. Specimens are grown in petri dishes in a growth chamber under controlled light and temperature conditions. Specimens grown in different inorganic nutrient media are observed with a light microscope using differential interference contrast microscopy. Hairs are photographed and their length measured. Preliminary results indicate that nutrient media do affect hair length. Since *Coleochaete* and *Chaetosphaeridium* are related to the ancestry of plants, discoveries about cell structure and function may be relevant to understanding cells of their plant relatives.