

# Individual Abstracts

## SYNTHESIS OF NEW DICARBAPORPHYRINOID SYSTEMS

Presenter: AbuSalim, Deyaa  
Student Class, Department: Graduate, Chemistry  
Mentor: Prof. Timothy Lash  
Author(s): Deyaa AbuSalim, Timothy Lash

Although carbaporphyrinoids with one carbocyclic ring in place of a pyrrole unit have been widely studied, far less work has been carried out on dicarbaporphyrinoid systems. Oxodibenziphlorins 1 were prepared by a "2+2" MacDonald condensation. Reduction with NaBH<sub>4</sub>-CeCl<sub>3</sub> afforded the related hydroxyphlorins 2 (Scheme 1). Current investigations are being directed towards the formation of stabilized carbocations 3 which may possess aromatic character. In addition, carbabilins 4 have been generated by reacting pyrrole aldehydes with bis(3-indenyl)methane and cyclization of these intermediates to dicarbaporphyrins 5 are being attempted (Scheme 2).

## UTILIZATION OF RESISTANCE TRAINING FACILITIES BY MEN AND WOMEN

Presenter: Ackerman, Brianna  
Student Class, Department: Graduate, Kinesiology and Recreation  
Mentor: Prof. David Thomas  
Author(s): Brianna Ackerman, David Thomas, Kristen Lagally, Lindy Lukenheimer, Tony Amorose, Kari Tunney

Resistance training is important for muscular strength and endurance, bone health, and metabolism. However, women tend to participate in resistance training at rates less than men do, despite its importance. **Purpose:** To determine the utilization rates of resistance training facilities within a recreation center on a university campus. **Methods:** There are five specific areas within the campus recreation facility dedicated to resistance training. Campus recreation employees record hourly use by sex for each area. This study analyzed the utilization rate of these areas at five distinct hours per day over the course of a 10-month period. Morning, noon, peak, evening, and female peak utilization intervals were selected for analysis. **Results:** Table 1 contains the total number of men and women, and percentages, using the five resistance training areas during those five intervals. Males primarily utilize the weight room, with females reporting less than a 6% usage rate amongst all time intervals. The core area shows the highest utilization by females, reporting 62% usage rate at peak female hours. **Conclusions:** Even though resistance training is of great importance to the health and well being of women, very few utilize resistance-training opportunities provided to them. Efforts must be made to encourage and convince women of the need to perform resistance training-based exercise.

**Table 1: Utilization of Training Facilities by Men and Women (N and Percent of Females Using Area)**

Location/Hour	9-10 am	10-11 am	12-1 pm	4-5 pm	6-7 pm
Fitness floor	M:231 F:136= 367 37.0%	M:794 F:421=1215 34.6%	M:503 F:300=803 37.3%	M:1428 F:512=1940 26.4%	M:1455 F:589=2044 28.8%
Weight room	M:2558 F:158=2716 5.8%	M:3512 F:129=3641 3.5%	M:5646 F:272=5918 4.6%	M:5747 F:206=5953 3.5%	M:6172 F:211=6383 3.3%
Nautilus	M:360 F:167=527 31.7%	M:500 F:230=730 31.5%	M:887 F:297=1184 25.1%	M:1043 F:421=1464 28.7%	M:870 F:386=1256 30.7%
Core	M:420 F:559=979 57.1%	M:693 F:830=1323 62.7%	M:1072 F:1198=2270 52.8%	M:1207 F:1375=2582 53.2%	M:1218 F:1131=2349 48.1%
Selectorized	M:277 F:315=592 53.2%	M:488 F:682=1170 58.3%	M:786 F:615=1401 43.9%	M:1009 F:709=1718 41.3%	M:824 F:687=1511 45.5%

**THE IMPACT OF SELF-HELP GROUPS ON THE SOCIAL CAPITAL OF RURAL COMMUNITY IN NEPAL**

Presenter: Adhikari, Shikshya  
 Student Class, Department: Graduate, Sociology and Anthropology  
 Mentor: Prof. Aaron Pitluck  
 Author(s):

Many women in rural Nepal are becoming members of self-help groups. By becoming members of self-help groups, women in rural Nepal have been able to come together and improve their livelihood through entrepreneurial or community development activities. Through these groups, women have been able to participate in income generating activities, interact with other members of their communities and the local government, and have a say in the decision making process within their households and in their communities. These women, while helping their families and communities in certain ways, are also diverting from the social norms by not conforming to the traditional gender roles. Through this research, I want to determine how participating in self-help groups affects the relationships of these women with their families and communities. In other words, I want to study how these self-help groups affect the social capital of a rural community in Nepal.

## **PRISONERS OF THE WAR ON TERROR: TORTURE, IMPRISONMENT, AND HUMANITARIAN LAW**

Presenter: Andrelczyk, Christine  
Student Class, Department: Graduate, Politics and Government  
Mentor: Prof. Michaelene Cox  
Author(s): Nina Cossidente

### Broad topic

Torture and treatment of detainees

### Research question

Since 9/11, are there any gaps in international humanitarian hard law related to the treatment of detainees/torture of detainees? This project will examine examples of prisoner abuses, such as Guantanamo Bay and CIA black sites, to shed light on these legal gaps.

### Significance/Justification

Real world significance: Since 9/11, the treatment of detainees has become increasingly noticeable and has raised a number of moral and legal questions related to the practice. This project will focus on ways in which torture and inhumane treatment could result from gaps in legal protection and how these loopholes or ambiguities could be exploited. To crystallize our research, we are going to examine hard human rights laws related to torture and how these laws can be undermined in order to allow for sites like Guantanamo Bay and clandestine CIA "black sites."

Academic significance: Since many people do not understand the intricacies of international law in terms detainee protection, it is imperative to study this subject from an academic perspective in order to educate people on the gaps in hard humanitarian law.

## **A COMPARISON OF PRESSURE BIOFEEDBACK TOOLS ON TRANSVERSUS ABDOMINIS ACTIVATION**

Presenter: Antosz, Elizabeth  
Student Class, Department: Undergraduate, Kinesiology and Recreation  
Mentor: Prof. Noelle Selkow  
Author(s): Jessica Wooldridge

Biofeedback is a technique used to allow the patient to see visually the muscular activity. However, there has been little evidence investigating the most effective biofeedback tool in measuring adequate transverse abdominis activation. A pressure biofeedback unit (PBU) allows the patient to receive visual biofeedback through monitoring the gage of the PBU for pressure changes during muscular contractions. While this a uniquely designed tool, a blood pressure cuff may be used instead to achieve the same results. Therefore, the purpose of this study is to compare transversus abdominis activation between a PBU and blood pressure cuff. Subjects will be randomized into one of 2 groups; PBU or blood pressure cuff. Initial baseline ultrasound measurements are taken assessing the effectiveness of transversus abdominis (TrA) activation.

This is done by evaluating the thickness of the TrA in resting and contracted states 3 times with instruction to perform an abdominal drawing-in maneuver (ADIM) with the following instruction: “inhale then exhale, at the point where you can no longer exhale draw your belly button to your spine”. Then the subject is allowed to use biofeedback (depending on group assignment) and receive proper verbal cueing during 10 ADIMs. After the 10 trials, 3 more images are taken of the TrA in a rested and contracted state. After 1 week, the subjects will return to use the opposite biofeedback tool. We believe that there will be no difference between the groups. This will allow clinicians to use a blood pressure cuff, which is available in any clinic, to increase the activation of the TrA, instead of having to purchase a specialized tool. In turn, rehabilitation for people with low back pain will be improved.

### **THE ROLE OF MICROTUBULE BRANCHING NUCLEATION IN CORTICAL MICROTUBULE ARRAY REORIENTATION IN PLANT CELLS RESPONDING TO GROWTH HORMONES**

Presenter: Atkinson, Samantha  
Student Class, Department: Graduate, Biological Sciences  
Mentor: Prof. Viktor Kirik  
Author(s): Samantha Atkinson, Angela Kirik, Viktor Kirik

Plant cortical microtubules are organized perpendicularly to the growing cell axis in response to different environmental cues. Hypocotyl cells of the light grown plants form longitudinal arrays on the periclinal surface. These arrays are able to reorient into transverse arrays when the hormones auxin and gibberelic acid are applied. Theories about the mechanism by which reorientation occurs vary, including, microtubule motors, treadmilling, nucleation, and localized catastrophe events.

We investigated the mechanisms of microtubule reorientation and the role that nucleation plays in that mechanism. The rates and types of microtubule nucleation were determined in both wild type and *ton2* mutant hypocotyl cells during hormone-induced microtubule reorientation. The *ton2* mutant, which has a deficiency in branching nucleation, provides a tool to assess the importance of branching nucleation for the microtubule reorientation in response to hormones. Our data has shown that cortical microtubules of the *ton2* mutants are able to reorient despite their deficiency in branching nucleation; though they reorient less efficiently and at a slower rate than the wild type cells. We also found that hormones did not cause a significant increase in nucleation for either the wild type or the *ton2* mutant. Hormones did cause an increase in the amount of microtubules that entered from the cell side for both wild type and the *ton2* mutant.

### **THE IMPACT OF MICROAGGRESSIONS AND STEREOTYPE THREAT IN SCHOOLS**

Presenter: Banks, Brea  
Student Class, Department: Graduate, Psychology  
Mentor: Prof. Steven Landau  
Author(s): Brea Banks, Steven Landau

Although the overt demonstration of racist behaviors and remarks are viewed as socially unacceptable, people of color report that they often experience acts of subtle racism by White individuals (Sue, Capodilupo, & Holder, 2008). Today, school-based professionals in the U.S. are

disproportionally White, whereas most of the children they serve are of students of color (Curtis, Lopez, Batsche, & Smith, 2006; National Center for Education Information, 2011; U.S. Census, 2012). These discrepancies are particularly concerning, as school professionals may inadvertently communicate hostile and racially charged slurs that can have negative effects on children's academic performance and how they feel about themselves.

The field of school psychology has moved toward a multi-tiered system of services for academics and social-emotional learning curricula. As such, school psychologists are more involved with consultation and intervention, instead of their traditional assessment roles. As such, school psychologists who are aware and sensitive to concerns regarding subtle racism can consult with teachers and other school professionals regarding school climate and social-emotional learning initiatives.

The presence of racial microaggressions and stereotype threat can negatively impact healthy classroom climates. Racial microaggressions are verbal, behavioral, or environmental slights directed at another person that are often automatic, unintentional, and often occur on a daily basis (Sue, Capodilupo, & Holder, 2008). These indiscretions seem harmless on the surface, but researchers have found that such slights perpetuate a worldview of White superiority and people of color report experiencing them regularly (Dovidio, 2002; Sue, Capodilupo, & Holder, 2008).

Stereotype threat refers to the risk or fear of confirming a negative stereotype about one's own group, must involve an identification with a relevant domain (e.g., viewing school as important), and deals directly with performance deficits (Steele, 1997). Although the occurrence of stereotype threat can be relevant across multiple areas in schools, it is especially relevant for school psychologists' role during data collection, as stereotype threat can compromise the reliability of findings.

The proposed poster will offer several learning opportunities for attendees. The presentation will provide attendees with an opportunity to benefit from having their perspective-taking skills enriched. Specifically, participants will learn that people see the same thing from different perspectives and that statements intended to be kind, may be heard as hurtful. Multiple suggestions will be offered as to how one can enhance classroom climate by keeping the phenomena of microaggressions and stereotype threat in mind.

#### **ACCURACY OF CONSUMER GRADE BIOELECTRICAL IMPEDANCE ANALYZERS TO ASSESS BODY COMPOSITION.**

Presenter:	Barnas, Jillian
Student Class, Department:	Graduate, Kinesiology and Recreation
Mentor:	Prof. Dale Brown
Author(s):	Jillian Barnas, Natalie Micinski, Laura Wheatley, Kelly Laurson, David Thomas, Dale Brown

There is a high demand for affordable body composition analysis technology to assess body fat and fat free mass. While there are a multitude of body composition analyzers available, their accuracy to assess body composition remains in question. Recent research has shown that the use of consumer-grade bioelectrical impedance (BIA) analyzers for determining body fat

percentages (%BF) can result in an overestimation of 8-10%.

**PURPOSE:** The purpose of this study was to examine the extent to which regression analysis could be used to correct for inaccuracies in consumer grade BIA devices.

**METHODS:** Seventy-six males and forty-nine females (mean  $\pm$  SD) [age:  $21 \pm 1.4$  yr., height:  $173.6 \pm 9.05$  cm., mass:  $76.23 \pm 20.19$  kg., body fat %:  $19.11 \pm 9.26\%$ ] participated in the study that found significant differences between BIA and the criterion reference of air displacement plethysmography (ADP). Linear regression analysis was used to develop equations to correct for BIA differences. Subsequently those equations were applied to an additional group of thirteen males and thirteen females (mean  $\pm$  SD) [age:  $21 \pm 1.6$  yr., height:  $172.13 \pm 8.31$  cm., mass:  $71.67 \pm 13.81$  kg., body fat %:  $18.49 \pm 9.03\%$ ]. All testing was completed during a single session with the subjects reporting to the laboratory having fasted and restricted fluid intake 4-h prior to testing. Height and weight were obtained followed by body composition assessments using ADP, BIA using Omron lower body analyzer (OmronLB), and BIA using Omron upper/lower body analyzer (OmronUBLB).

**RESULTS:** Corrected Omron LB analysis applied to the OmronLB and ADP cross validation group revealed no significant differences using paired t-tests. In contrast, paired t-test analysis revealed that linear regression analysis applied to the OmronUBLB and ADP cross validation group did not significantly improve the %BF between those methods.

**CONCLUSION:** %BF results obtained from the Omron LB consumer-grade device yielded a more accurate assessment of %BF. However, results for the OmronUBLB did not improve with a correction factor. Estimating %BF from various consumer-grade techniques should be used cautiously since they may provide mixed results in regard to accuracy.

## **ARE WE TRULY HELPING OUR YOUTH?**

Presenter:	Black, Christopher
Student Class, Department:	Graduate, Social Work
Mentor:	Prof. Kathryn Wehrmann
Author(s):	Christopher Black

When looking at the juvenile clientele who are served by the state of Illinois, a question may come to mind as to what happens to these youth when they are no longer in foster care? Clients in the care of the state are faced with adversities throughout their time in the system. While these clients are in care, these issues are addressed by the foster care system. However, when these clients are released from care and left to overcome all future adversities, they only have themselves to rely on. There are thousands of teens who are emancipated annually. The intention of this study is to provide the identified clients with additional clinical interventions to aid them toward more successful transitions after emancipation.

The co-principal investigator is an MSW intern, a full-time employee at a child welfare agency in a Midwestern town, the co-principal investigator will be taking the role of the "Skills Coach", and providing community based interventions to the identified clients. The co-principal investigator will utilize existing data in the form of the Ansell Casey Life Skills Assessments (Ansell Casey) and the Ohio (youth/worker) Assessment. In order to establish a baseline for the clients participating in this study, a pre-test of the existing assessments will be completed. The participants will then take part in community based support intervention therapy to help address presenting issues. These participants will be assessed after every twelfth session to monitor their progress. The agency has established a benchmark to be met on all assessments before they

will deem their progress satisfactory. For the Ansell Casey, the agency has determined that an overall increase of 20% in independent skills from their baseline must be obtained before meeting the satisfactory benchmark for this assessment. For the Ohio Assessment, problem section, the agency has set a benchmark of 48 to be obtained by a client before reaching a satisfactory level in treatment. Additionally, for the functioning section of the Ohio Assessment a score of 60 must be obtained before they will be deemed to have reached a satisfactory level of progress in the program. Clients must reach a satisfactory level in all three assessments before they can successfully complete the program. The results of the assessments will determine if there was a significant change in the client's independent skills from their initial baseline assessments.

### **CHILDREN OF ADULT PATIENTS: ARE CHILD LIFE SPECIALISTS PREPARED TO WORK WITH THIS POPULATION? DOES SELF-EFFICACY HAVE AN IMPACT ON THEIR ROLE?**

Presenter: Blader, Daphne  
Student Class, Department: Graduate, Family and Consumer Sciences  
Mentor: Prof. Connor Walters  
Author(s): Daphne Blader, Connor Walters, Bill Anderson, Jennifer Banning

This study will help medical and social service professionals better understand the preparation and role of Child Life Specialists working with children of adult patients. Prior to this there has been minimal research in the field of Child Life that focuses on children of adult patients. In conducting a literature review only one study has been identified that focused on the subjects of children of adult patients related to Certified Child Life Specialists, "How do we Talk to the Children? Child Life Consultation to Support the Children of Seriously Ill Adult Patients", (Sutter & Reid, 2012). Given the lack of relevant literature this study is explorative in nature. The purpose of this study is to examine a variety of variables related to Child Life as a profession including the formal training of the Certified Child Life Specialists (CCLS), the prior experience of the CCLS (internship, fellowships, etc.), conferences and workshops to aid in their profession, type of facility in which the CCLS work, self-efficacy of the CCLS in general and with the meeting needs of children of adult patients. Data also will be collected regarding the ages of the population of the child of the adult patient provides services to. These variables will allow the investigators to better understand the profession of Child Life and how it may serve children of adult patients as well as the role of general self-efficacy as it is related to perceptions of competence.

### **PLACEMENT DISRUPTION**

Presenter: Blake, Kandace  
Student Class, Department: Graduate, Social Work  
Mentor: Prof. Kathryn Wehrmann  
Author(s): Kandace Blake

Foster care placement disruptions results in a child experiencing adverse reactions. According to Blakey, Leathers, Lawler, Washington, Natschke, Strand, and Walton (2012), an estimated 22% to 70% of foster care placements disrupt in any given year. It is important for agencies to attempt to prevent placement disruptions within their programs. This study at a foster care agency in the mid-west, evaluates the number of placement disruptions that takes place in their foster care program and the common themes behind the disruption. The results of this

evaluation will be beneficial to the agency because it will be able to show a trend in why placements will disrupt. This research will be useful to the agency so that they can better their foster care department.

### **JAMES MADISON: FAITH AND THE FOUNDATION OF RELIGIOUS FREEDOM**

Presenter: Blankenship, Jason  
Student Class, Department: Undergraduate, History  
Mentor: Prof. Anthony Crubaugh  
Author(s):

This article examines James Madison's faith and the role it played in the foundation of freedom of religion in the United States. The article argues that James Madison's faith, while difficult to pinpoint on the Christian spectrum in the context of 18th-century intellectual and theological trends, was vital to his success in establishing religious freedom in the United States. An examination of public and private correspondence by Madison and contemporaries—especially Madison's Memorial and Remonstrance against Religious Assessments (1785)—coupled with his actions, establishes Madison's strong if unorthodox personal faith and his support for religious freedom. Likely a deist, Madison never suffered the attacks on his personal character or his policies that other Deists, such as Thomas Jefferson, endured. By showing such an enduring and strong faith, coupled with support for religion of all sorts, Madison could appeal to the broad spectrum of Christian sects in the United States to gain the support he needed.

### **EGGSHELL PERMEABILITY IN CLUTCHES OF HOUSE WRENS (TROGLODYTES AEDON): IMPLICATIONS FOR HATCHING ASYNCHRONY**

Presenter: Bowers, Emerson  
Student Class, Department: Graduate, Biological Sciences  
Mentor: Profs. Charles Thompson, Scott Sakaluk  
Author(s): E. Keith Bowers, Abigail White, Lauren Podgorski, Charles Thompson, Given Harper, Scott Sakaluk, William Jaeckle

Asynchronous hatching of eggs within clutches is a common pattern and occurs when two or more days elapse between the hatching of the first and last eggs of a clutch, whereas synchronous hatching occurs when all eggs of a clutch hatch within approximately one day. A population of house wrens (*Troglodytes aedon*) in central Illinois exhibits pronounced among-clutch variation in hatching spans, and maternal incubation behavior contributes to this variation: the onset of full incubation before clutch completion leads to asynchronous hatching, and delaying incubation until clutch completion leads to synchronous hatching. Eggshell characteristics may also contribute to variation in hatching spans, where differences in eggshell permeability can create differences in the rates of embryonic development between earlier- and later-laid eggs within clutches.

In this study, we characterized among- and within-clutch variation in the permeability of house wren eggshells to determine whether differences in eggshell permeability contribute to variation in hatching patterns. Within clutches, later-laid eggs had more pores per egg than earlier-laid eggs, but overall eggshell porosity did not change across the egg-laying sequence. Females that initiated full incubation before producing all the eggs of their clutch produced eggshells with more pores and slightly greater porosity, on average, than females that delayed



incubation until clutch completion. Our data indicate that eggshell permeability varies substantially both within and among clutches, and that a dominant behavioral predictor of hatching asynchrony (i.e., onset of incubation) is correlated with the physical properties of eggshells that are produced.

### **STAFF PERSPECTIVES OF THE EFFECTIVENESS OF THE POSITIVE BEHAVIORAL INTERVENTION SYSTEM (PBIS)**

Presenter: Bramm, Kelly  
Student Class, Department: Graduate, Social Work  
Mentor: Prof. Katheryn Sheridan  
Author(s): Kelly Bramm

This program evaluation examines school staff's perspectives of the effectiveness of the Positive Behavioral Intervention System (PBIS) in Heyworth School District. The PBIS program is a program implemented throughout the entire school district that promotes positive behavior. Many schools across the country have adopted this program as their main method of behavioral intervention. The goal of this study is to gather information about how school staff perceive the program's effectiveness in addressing problematic behaviors such as classroom interruptions or disturbances and inappropriate social interactions. Information gathered from this study will be used to determine how effective the PBIS program is in Heyworth School District and provide knowledge of areas that need improvement in its implementation.

### **TASK SWITCHING IN BILINGUALS: FURTHER INVESTIGATION OF THE BILINGUAL ADVANTAGE**

Presenter: Brown, Jennifer  
Student Class, Department: Graduate, Psychology  
Mentor: Prof. John Cutting  
Author(s):

Recent research has suggested that speaking more than one language may lead to benefits across a variety of different cognitive tasks. This effect has been dubbed the Bilingual Advantage. It has been suggested that this advantage relates to more the development of greater efficiency with processes involved in task-switching. The current study used a task-switching task to investigate three of these processes: reconfiguration, monitoring, and inhibitory control processes.

Monolingual and bilingual participants were presented blocks of trials in which they had to either categorize words as either abstract or concrete, or pictures as man made or natural. In some blocks, only one task was presented (single-task). In other blocks both word and picture trials were presented (mixed-task). Stimuli were presented in two formats: univalent stimuli contained only words or pictures and bivalent stimuli contained both a word and a picture. In the bivalent conditions, participants were cued to respond to either the picture or the word. Reconfiguration corresponds to the participants' ability to change from one task set (e.g., categorizing words) to another (categorizing pictures). This is measured in this task by comparing the switch (categorizing words -> categorizing pictures) to non-switch trials (categorizing words -> categorizing words) within the mixed-task blocks. Monitoring processes are activated on a trial-by-trial basis when the participant decides if a switch in mental sets is necessary. This process was measured by comparing performance between non-switch trials in single-task and mixed-task blocks. Inhibitory processes were measured by comparing

performance between the univalent and bivalent trials. Recent results using similar procedures have yielded mixed results. Prior and MacWhinney (2010) found that bilinguals were much faster at categorizing stimuli during the mixed-task blocks (using conditions corresponding only the univalent stimulus conditions described above). The authors concluded that bilinguals' increased performance was due to the bilinguals' ability to more quickly overcome interference of the task set for the previous trial (i.e. reconfiguration). However, Hernandez, Martin, Barcelo, and Costa (2013) replicated the Prior and MacWhinney study and found the opposite results. They speculated that the conflicting results may have been related to differences in participant characteristics. The research reported here attempts to clarify the earlier results, and further extend them to investigate the role of inhibitory control processes.

### **ASYMMETRIC SYNTHESIS OF HIV PROTEASE INHIBITOR NELFINAVIR**

Presenter: Bruce, Juandah  
Student Class, Department: Undergraduate, Biological Sciences  
Mentor(s): Prof. Shawn Hitchcock  
Author(s): Juandah Bruce, Shawn Hitchcock

Protease inhibitors have major applications in the medical field, specifically Nelfinavir, which goes by the name of Viracept to the general public. The job of a protease inhibitor is to interfere with protease enzyme associated with the HIV virus. Once the catabolism of the specific protein is blocked, the process that the protein was initially responsible for is completely shut down and unable to function properly. Protease inhibitors like Nelfinavir are essential in the fight against the progression of HIV to AIDS.

The synthesis of nelfinavir via an asymmetric aldol reaction pathway has been described in the chemical literature. This research is focused on using an asymmetric glycolate aldol addition reaction to achieve the synthesis. It is proposed that the glycolate pathway will prove to be more efficient as fewer steps would be needed in the preparation. The research for this work began with the production of a chiral auxiliary derived from L-phenylalaninol using thiophosgene, triethylamine, and dichloromethane. The product was purified by flash column chromatography in a 70:30 hexanes: ethyl acetate solution. The thione obtained from flash column chromatography was acylated with 4-methoxyphenoxy-acetic acid, N-(3-Dimethylaminopropyl)-N'-ethylcarbodiimide (EDC), and 4-Dimethylaminopyridine (DMAP). This product was purified using flash column chromatography in a 75:25 system. A boron catalyzed asymmetric aldol was carried out on the product using triethylamine, dibutylboron triflate, and enzyloxacetaldehyde. The Aldol reaction is the central concern at this time as there is a need for refinement in the asymmetric glycolate aldol reaction. Future directions include a reduction using Dibal-H and a reductive acylation. This presentation will illustrate the progress that has been made and the work that remains to be done.

### **RHENIUM BASED CLUSTER COMPLEXES CONTAINING ISOCYANIDE LIGANDS**

Presenter: Bruck, Andrea  
Student Class, Department: Undergraduate, Chemistry  
Mentor(s): Prof. Lisa Szczepura  
Author(s):

Studies in the Szczepura group have focused on the synthesis of terminal ligands on the hexarhenium cluster cores  $[Re_6Se_8]^{2+}$ . Previously,  $[Re_6Se_8(PEt_3)_5L]^{2+}$ ,  $L = MeCN, PhCN,$  and  $tBuCN$  were used to investigate haloalcohol cyclization forming 1,3-oxazine and 1,2-oxazoline ligands. This study focuses on the coordination of the isocyanide group to our cluster of interest. Isocyanides are an isomer of the previously coordinated nitriles, but have unique binding properties and reactivity. Synthesis and characterization of mono-substituted clusters containing isocyanide ligands will be conducted. These isocyanide complexes will then be used to test the resulting reactivity of the isocyanide group coordinated to the  $[Re_6Se_8]^{2+}$  core. This presentation will cover our initial results in this study.

## **EFFECTIVENESS OF THE WHY TRY INTERVENTION AT INCREASING STUDENT MOTIVATION AND GRADES**

Presenter: Cardiff, Angela  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Sheridan  
Author(s):

Students across the nation struggle with staying engaged and motivated to do well in school, often leading to drop out before high school graduation. Many researchers have attempted to determine what keeps some students in school and motivated to do well. The Why Try: Resilience Education intervention claims to increase the motivation and overall academic performance of students at any age. This program evaluation examines the effectiveness of the Why Try intervention which is being implemented at a middle school in central Illinois with 12 8th grade students. Participants of this study are the teachers of the students who are receiving the intervention. Utilizing a survey, the school related behaviors of the students (work completion, attendance, attitude, effort and engagement) are examined both before and after the intervention. Grade percentages before, during, and after the intervention are also utilized as indicators of motivation and academic performance. Findings will assist the implementers of the Why Try intervention to determine if the intervention should continue to be used with future groups of students.

## **IRONIC EFFECTS OF STIGMATIZING TOBACCO SMOKING**

Presenter: Cayer, John  
Student Class, Department: Graduate, Psychology  
Mentor(s): Profs. John Pryor, Eric Wesselmann  
Author(s): John Pryor, John Cayer, Eric Wesselmann

**Problem or Purpose:** Once seen as a matter of personal choice, tobacco smoking is increasingly viewed as a stigmatizing behavior in the US (Rozin & Singh, 1999; Stuber, Galea, & Link, 2008). Laws strictly limit the public places where people can freely smoke. Recent media campaigns use graphic images of diseased smokers in an effort to discourage people from becoming smokers and encouraging smokers to quit. In this research we examined the relationship between perceptions of a public stigma associated with smoking and intentions to quit smoking. Instead of predicting that smokers who perceive more public stigma would have stronger intentions to quit smoking, we predicted that perceived public stigma would be related to increased affiliation with smoking companions which would in turn be related to fewer close friends encouraging

smokers to quit.

Procedure: We administered a cross sectional survey to a diverse sample of 243 smokers recruited using MTurk. The survey assessed years smoking, intention to quit in the next six months, perceived social encouragement to quit from one's five closest friends, health-related attitudes about smoking, perceived control of quitting (e.g., feeling addicted), how many of the five closest friends were smoking companions ("smoking buddies"), and perceived public stigma of smoking.

Results: Relative importance analyses (Krasikova, LeBreton, & Tonidandel, 2011) found that health-related attitudes and perceived social encouragement to quit were the most important predictors of quitting intentions, accounting for 91% of  $R^2$ . Perceived public stigma did not have a significant direct relationship to intentions. While neither public stigma nor number of "smoking buddies" was correlated with health-related attitudes about smoking, both were significantly correlated with perceived social encouragement to quit,  $r(243) = -.16$ ,  $p = .02$  and  $r(243) = -.20$ ,  $p < .01$ , respectively. We tested the hypothesis that the relationship between public stigma and perceived encouragement to quit was mediated through variations in the number of close friends who were "smoking buddies" using a bootstrapping approach (Preacher & Hayes, 2008). This analysis revealed a significant indirect effect of public stigma upon perceived encouragement to quit through the mediator, number of "smoking buddies,"  $z = 2.10$ ,  $p = .04$ .

Conclusions and implications. Our results suggest that perceived public stigma is related to more close affiliation with "smoking buddies," which in turn is related to diminished encouragement to quit smoking. Social encouragement to quit is one of the more important predictors of intentions to quit.

## **STUDIES OF OPTIMIZATION OF PORE SIZE FOR GOLD PLATED FILTERS AS HIGHLY ENHANCING SURFACE-ENHANCED RAMAN SCATTERING (SERS) SUBSTRATES**

Presenter: Cermak, Lindsey  
Student Class, Department: Undergraduate, Chemistry  
Mentor(s): Prof. Jeremy Driskell  
Author(s):

This study describes the beginning stage of discovering, fabricating, and optimizing what pore size would be best for gold plated filters as highly enhancing surface-enhanced Raman scattering (SERS) substrates. Polycarbonate track etched filter membranes will be plated with a thin layer of gold via electroless deposition. By first plating gold onto the surface of a filter paper the substrate will be made. A Raman reporter molecule, 4-nitrobenzenethiol (NBT), is adsorbed onto the gold filters and utilized as a model compound to assess the SERS activity. It is well established that SERS enhancement is dependent on the nanomorphology of the substrate. Thus, systematic variation of filter pore size and gold plating time will be investigated as a means to systematically and reproducibly control filter morphology. Scanning electron microscopy (SEM) is utilized to analyze the pore sizes after gold plating, i.e., nanomorphology, and correlate to the SERS intensity. Preliminary results suggest filters with a nominal pore size of 200 nm provide the maximum SERS enhancement. Additional studies to evaluate heterogeneity of the SERS signal across the filter surface and establish a detection limit are planned.

## **A CALL FOR CHANGE: INTERNATIONAL STUDENT TEACHING**

Presenter: Chacko, Jacob  
Student Class, Department: Graduate, Teaching and Learning  
Mentor(s): Prof. Miranda Lin  
Author(s):

As globalization lessens the distance between peoples and diversifies the common classroom, Teacher Education (TE) programs lag behind in producing globally-minded educators. One approach used by some TE programs to remedy this issue is to offer International Student Teaching (IST) experiences. While the literature related to these programs is rather positive, information related to why students choose to participate in IST experiences and the challenges they encounter while abroad is limited. This study attempts to fill this gap in the literature. Drawing on interview data from current (n=3) and former (n=2) participants, as well as two program administrators, this multiple case study utilized a cross-case analysis to draw conclusions within and between the cases. Programmatic recommendations are included that are applicable to both faculty members and study abroad professionals.

Key words: International Student Teaching

## **THE EFFICACY OF CHARACTER EDUCATION IN ELEMENTARY SCHOOL**

Presenter: Childers, Len  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Sheridan  
Author(s):

Character education in schools is targeted at teaching school children the benefits of pro-social behavior, such as the values of respect, responsibility, trustworthiness, citizenship, and kindness. While many schools currently use some form of a character education curriculum, many still do not believe it improves social and academic behaviors in students. The purpose of this evaluation is to find out whether the character education program at Ridgeview Elementary School improves classroom behavior and academic performance in students throughout the school year. Surveys are administered to 14 teachers electronically, and aggregate scores from two benchmark scoring tests during the 2013-2014 school year will be used to identify improvements in student behavior and academic performance. Results will be shared with school administrators and staff to detect achievement gaps and implement improvements for greater program effectiveness in future cohorts.

## **TERRORISM: LIBYA'S ROLE IN THE INSTABILITY OF THE REGION**

Presenter: Comens, Cayla  
Student Class, Department: Graduate, Criminal Justice Sciences  
Mentor(s): Prof. Cara Rabe-Hemp  
Author(s):

When media focuses its attention on the subject of terrorism, the country of Libya is not typically at the forefront of the discussion. However, Libya has had a deep hand in terrorism dating back to when Colonel Muammar Qaddafi took control of the country in 1969. During the

years that Qaddafi was in control, he financially backed terrorist organizations, who repeatedly aimed their sights on the United States and their allies. Even after the fall of Qaddafi's regime, terrorism is still a part of the governmental strategy in the country. The attack in Benghazi against an American compound, which resulted in 4 American deaths shows that terrorism is alive and well within Libya. In this analysis, I will show the history of Libya prior to the Qaddafi regime, and terrorism during and after Qaddafi's regime. I will also show the connections between terrorism and the instability of the region following the fall of Qaddafi. The findings of this investigation, will inform the academic research, as well as the counter-terrorism efforts in Libya.

## **RESPONSE DYNAMICS IN PROSPECTIVE MEMORY**

Presenter: Conte, Angela  
Student Class, Department: Graduate, Psychology  
Mentor(s): Prof. Dawn McBride  
Author(s): Angela Conte

Prospective Memory (PM) is the act of remembering to perform a future intended action such as remembering to call a friend next week or picking up stamps before going home. Einstein and McDaniel (2005) propose a multiprocess view that includes both monitoring and spontaneous retrieval in PM when cognitive demands are high. Monitoring is a process by which the participant is rehearsing the intended action until the cue or time of retrieval. This process consumes all cognitive resources that are available. Spontaneous retrieval is less consuming as it is an automatic process that occurs when the cue or time is presented. Typically PM is investigated with a computer based task where the reaction time (RT) of key strokes is measured.

The current study used the freely available Mouse Tracker software (Freeman and Ambady, 2010) that records mouse movements, complete decision response times, and movement trajectories over time.

The current study is investigating how cue focality in a PM task might influence the response in a lexical decision task. Research has shown that focal PM cues induce spontaneous retrieval processes and nonfocal PM cues induce monitoring. This evidence is supported by at RT difference and PM cost of accuracy. We are interested in the ongoing decision making process and can hypothesize that attentional resources will be seen in response trajectories.

Participants completed a lexical decision task where they were asked to decide if a string of letters was a word or not. The first phase of the experiment was used as a baseline comparison to the second phase where a PM task was added. Participants in the focal condition were asked to press a small "X" in the corner of the screen when they encountered the words HORSE or TIGER. Similarly, participants in the nonfocal condition were asked to press the "X" when they encountered any animal word. The PM cues were the same across conditions and each presented three times in a fixed position. Participants in the control conditions were asked to continue with the same instructions as in the baseline block.

The Mouse Tracking data showed differences in trajectories across the three conditions that were not initially seen in the mean reaction time data. The mouse dynamics differences suggest potential processing variation between focality cues as predicted by previous theoretical descriptions of PM processing.

## **IMPLEMENTATION OF A SOCIAL EMOTIONAL LEARNING INTERVENTION IN A RURAL SCHOOL SYSTEM**

Presenter: Corbin, Alexander  
Student Class, Department: Undergraduate, Psychology  
Mentor(s): Prof. Adena Meyers  
Author(s): Adena Meyers, Renée M. Tobin, Jennifer Engelland

The current study examines the implementation of a social and emotional learning (SEL) program involving students from Kindergarten through junior high school. SEL programs have been shown to improve children's social and emotional skills, attitudes, behavior, and academic performance, and research indicates that the strongest effects are observed when programs are implemented carefully and consistently (Durlak et al., 2011). For example, one such program, Positive Action (PA) is a comprehensive, school-wide intervention designed to improve academics, student behaviors, and character (Synder et al., 2010). Evidence indicates that PA has improved performance on standardized tests of reading and math, and led to reductions in absences and suspensions. Importantly, PA schools had significantly higher math and reading scores when teachers spent the expected amount of time (about 55 min/week) and delivered PA almost every week of the school year (Synder et al., 2010). Overall this study showed significantly higher achievement and lower absenteeism and suspension outcomes for PA schools, and demonstrated the importance of high-quality implementation in achieving these results. The current project examines PA implementation in a rural county in Central Illinois. This project delivers PA in schools across Livingston County in grades Prek-8 as part of a multitiered system of support for children's mental health. Its aim is to improve children's mental health services by implementing a universal school-based curriculum addressing SEL objectives (Meyers et al., in press). In order to assess SEL implementation in this context, classroom teachers have been asked to complete implementation integrity checklists documenting the dates and lengths of the lessons they delivered as well as the lesson components. This presentation will summarize the implementation data that has been collected over the past 2.5 years from the participating schools. The average number of lessons and length of time spent delivering the curriculum will be examined, and trends in implementation over time will be examined.

## **FEAR OF FALLING**

Presenter: Cox, Carolyn  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Sheridan  
Author(s):

The level of fear associated with the idea of falling has been well established through previous research published over the course of several decades. The purpose of this exploratory study is to examine the fear of falling experienced by individuals of an Illinois Adult Day Services program all of whom are over the age of 60 and live independently in a variety of rural and urban settings. Utilizing a survey, the study explores how the fear of falling affects participant's daily life and willingness to take part in activities when the potential for a fall is considered. Past

experiences with falls, the use of assistive devices, and willingness to self-disclose when a fall has occurred are explored. Findings will be utilized to inform agency administrators and staff in the development of appropriate interventions.

### **MANPOWER PLANNING WITH UNCERTAIN DEMAND**

Presenter: Digby, Jacob  
Student Class, Department: Graduate, Technology  
Mentor(s): Prof. Borinara Park  
Author(s): Jacob Digby, Borinara Park

#### *Need:*

To better plan for manpower needs for inbound operations in a service parts distribution center.

#### *Overview:*

Distribution centers have uneven demand in inbound operations. This is exacerbated, especially in the long run, when visibility to inbound receipts is low. Managers must set staffing levels of inbound operations to minimize the total cost of labor and inventory holding cost.

#### *Major Points:*

- Inbound volumes to distribution centers vary and have limited visibility.
- Staffing decisions are difficult due to the variability.
- Managers must also make decisions on staffing which minimize the total cost of labor and inventory.

#### *Summary:*

A Monte Carlo simulation can help managers better decide staffing levels in inbound operations. Historical data can provide evidence for the most accurate distributions of demand volumes and inbound productivity. Data for cost of inventory also exists, which can provide some interesting insights to the trade-off between inbound velocity and inventory holding cost.

### **PRIMING MAGICAL THINKING AND REACTIONS TO STIGMAS**

Presenter: Earl, Jaime  
Student Class, Department: Undergraduate, Psychology  
Mentor(s): Prof. John Pryor  
Author(s): Christine D. LeFever

Research in our labs has explored how priming magical thinking can exacerbate negative reactions to stigmas. We have found that this relationship is moderated by participants' motivations for deliberative thinking. In several prior studies, we have found that participants who are low in the Need for Cognition (NFC; Epstein, Pacini, Denes-Raj, & Heier, 1996) had more negative reactions to a variety of stigmas following priming. In the current study, we explored



these same relationships using MouseTracker software (Freeman & Ambady, 2010). This methodology allowed us to assess real-time psychological reactions to stigmas.

130 volunteers were randomly assigned to either a Magic Priming or a Control condition. In the Magic Priming condition, participants were asked to indicate whether they agreed or disagreed with 22 statements about magical beliefs/behaviors (e.g., "It might be possible for a house or a place to be haunted?"). Control participants were asked about endorsement of non-magical beliefs/behaviors. Following this manipulation, participants were asked to imagine entering a waiting room and selecting a seat. A computer screen depicted 4 desks, the left most of which was occupied. A phrase described the person seated. Eighteen descriptions depicted 3 social groups: highly appropriate targets of negative feelings (e.g., racist), highly inappropriate targets of negative feelings (e.g., deaf person), and possibly appropriate targets of negative feelings (e.g., smoker) (Crandall, Eshelman, & O'Brien, 2002). Participants were instructed to move a computer cursor from the top of the screen to the open desk they chose to sit in. Cursor distance to the target person was recorded in 500ms intervals. Afterwards, participants completed the NFC scale. 98% of participants in the Magic Priming condition endorsed at least 1 magical belief/behavior ( $M=8.59$ ,  $SD=4.37$ ), replicating previous studies. A significant multivariate interaction indicated that NFC was significantly correlated with the distance of the cursor to the targets perceived to be possibly appropriate targets of negative feelings after 3 seconds of movement in the condition where magical thinking was primed. NFC was not correlated with cursor distance in any other conditions.

This study replicated the basic findings of our previous research: NFC moderated the impact of priming magical thinking upon reactions to stigmas. In the current study, this moderation effect only occurred when the stigmas were considered to be moderately appropriate targets of negative feelings.

### **COMMITTING TO A LONG-DISTANCE RELATIONSHIP: NEW FINDINGS ON THE ROLE OF EMOTIONAL AFFECT AND PREFERENCES FOR FREQUENT SEX**

Presenter: Eichler, Fredrick

Student Class, Department: Graduate, Psychology

Mentor(s): Profs. Eric Wesselmann, Matthew Hesson-McInnis

Author(s): Fredrick Eichler, Eric Wesselmann, Matthew Hesson-McInnis

Long distance relationship (LDR) researchers often attempt to answer the question, "Do long-distance relationships work?"

Cameron and Ross (2007) report that relational stability and negative affect predict stay/leave behavior between couples in LDRs. We sought to replicate this research and include other potential predictors of commitment to one's partner. Throughout the United States, 156 men and 225 women completed a survey via Amazon's MTurk that included the same measures used by Cameron and Ross, the PANAS, and a scale constructed to measure preferences for frequent sex. Relational security - but neither positive nor negative affect - predicted overall commitment for men and women. Men's preferences for frequent sex, however, positively predicted commitment and accounted for significantly more variance over relational security alone. Females' preference for frequent sex did not predict commitment. Although unable to replicate previous findings that negative affect continues to influence the relationship, the role for sex in LDRs warrants further investigation.

## **EFFECTS OF RECOLLECTIONS OF ACADEMIC OUTCOME ON MATH ASSIGNMENT CHOICE**

Presenter: Fisher, Jessica  
Student Class, Department: Graduate, Psychology  
Mentor(s): Prof. Gary Cates  
Author(s): Jessica Fisher, Kerry Pecho, Kiley Bliss, Gary Cates

Previous interspersal research has demonstrated a likelihood for student to choose math assignments with shorter, easier problems interspersed among longer, more difficult problems (e.g. Cates & Dalenberg, 2005; Logan & Skinner, 1998). In this experiment, recollections of past histories of reinforcement or punishment were compared to student choice of interspersal or control math assignments. Results show that recollections of past history do not impact student assignment choice.

## **SYNTHESIS OF ELECTRON-RICH BENZIPORPHYRIN ANALOGS**

Presenter: Fosu, Stacy  
Student Class, Department: Graduate, Chemistry  
Mentor(s): Prof. Timothy Lash  
Author(s):

Carbaporphyrins are porphyrin analogs in which one of the internal nitrogens is replaced by carbon. In the related carbaporphyrinoid, benziporphyrin, the pyrrole ring is substituted with a benzene moiety. Although benziporphyrins are not aromatic due to cross conjugation, these systems give further insights into the characteristics of carbaporphyrins and porphyrins. Dimethoxybenzporphyrins have been shown to have some diatropic character and this is enhanced upon protonation. In order to investigate this phenomenon in related porphyrinoids, dimethoxybenztripyrans were prepared by reacting dimethoxybenzene or dimethoxytoluene dicarbinol derivatives with excess pyrrole in the presence of boron trifluoride etherate. Condensation with a thiophene dicarbinol and oxidation with DDQ afforded dimethoxythiabenziporphyrins. The synthesis of related carbaporphyrinoids by this approach is presently under investigation.

## **NEW INDIVIDUAL DIFFERENCES PREDICTORS OF COUNTERPRODUCTIVE WORK BEHAVIORS**

Primary Group Member: Gabka, Kamila  
Student Class, Department: Graduate, Psychology  
Mentor(s): Profs. Alexandra Ilie, Dan Ispas  
Author(s): Kamila Gabka, Nicole Menolascino, Alexandra Ilie, Dan Isaps

Most of the research on individual differences as predictors of negative employee behaviors (known as counterproductive work behaviors) has focused on personality traits organized under the five-factor model of personality. We reviewed studies examining new individual differences predictors, including impulsivity and boredom proneness. We propose a new study exploring the interaction between boredom proneness and conscientiousness related traits for the

prediction of counterproductive work behaviors. Implications for research and practice are discussed.

### **COMFORT-RELATED FACTORS AFFECTING THE USE OF PERSONAL PROTECTIVE EYEWEAR AMONG A NEW WORKER POPULATION.**

Presenter: Gall, Jean Nicole  
Student Class, Department: Undergraduate, Health Sciences  
Mentor(s): Prof. David Grieshaber  
Author(s): J. Nicole Gall, D. Christian Grieshaber

To identify comfort-related factors that influence new workers willingness to use personal protective eyewear. New workers are considered to have one of the highest rates of eye injuries.

Research was collected using a simulated eight hour work day. The simulated eight hour work day included two 15-minute breaks and a 30-minute lunch break. Participants were required to wear personal protective eyewear for the entire eight hour day, except during breaks.

Participants were selected from a general education class, with efforts made to balance the number of male and female volunteers. Four different styles of personal protective eyewear were used. Participants were encouraged to participate four days, thus experiencing all four styles of personal protective eyewear. The style of protective eyewear was randomly assigned to counteract any biases from previous protective eyewear experience.

Themes that emerged from the preliminary data; participants found safety glasses with no nosepiece uncomfortable. However, a large or a bright color nose piece was distracting. Participants also preferred protective eyewear that was adjustable.

In situations where reengineering is not possible, the best defense against eye injury is protective eyewear. Finding comfort-related factors that influence protective eyewear compliance may reduce the injury rates among these workers.

### **IMPROVED DECISION-MAKING FOR CAPITAL INTENSIVE UNIVERSITY SUSTAINABILITY PROJECTS UNDER UNCERTAINTY**

Presenter: Gilmore, Emma  
Student Class, Department: Graduate, Technology  
Mentor(s): Profs. Jin Jo, Borinara Park  
Author(s): Emma Gilmore, Jin Jo, Borinara Park

In the new millennium, sustainability has become a chief concern of communities who hope to create lasting value with minimal impact on the environment around them. To this end, many institutions of higher education have identified the need to develop formal sustainability plans that address the specific activities carried out by colleges and universities. On such a large scale, energy efficiency and fossil-fuel saving projects are capital intensive, so the institutions that initiate them must ensure that sufficient monetary and environmental benefits will justify the expense. Because the business case to invest in sustainability projects is highly dependent on

factors subject to a large degree of uncertainty, there is a need to fully analyze all variables involved in these projects. In this report, a decision tree framework is utilized to quantify and assess the factors influencing emissions mitigation project selection at colleges and universities from across different climate zones and demographic categories. Stochastic modeling, specifically Monte Carlo simulation, is then employed to assess the most probable financial and environmental outcomes across the broad array of project determinants. Finally, sensitivity analyses are conducted on the project results to reveal the most crucial factors in project outcome. The proposed approach allows faculty, administration, staff, and students to evaluate uncertain factors in the optimization of financial allocations to sustainability projects.

### **THE ARTS AND AT RISK YOUTH: A CALL FOR MORE, NOT LESS, EXPOSURE**

Presenter: Goffard, Kevin  
Student Class, Department: Undergraduate, Theatre  
Mentor(s): Prof. Shannon O'Neill  
Author(s):

Everyday, in America, 70,732 youth walk the halls of detention centers and jails, while hundreds of thousands of others are at-risk. In addition, 1 in 4 of those confined youth are incarcerated for a violent crime therefore making 40% of our confined youth population being incarcerated for low level crimes, or crimes that would not of been illegal if they were older. America have been searching for a long time for an approach or program that could help reduce the number of incarcerated youth, as well as prevent at-risk youth from leading a life that could potentially land them incarcerated. The answer to this question is the arts.

This research project takes a look at the arts effect on at-risk and incarcerated youth, and will make the claim that the arts can have a positive effect on these youth. The exposure of arts to these youth helps them learn self-expression, self-esteem, cooperation in working with others, as well as many other crucial social and psychological skills that these youth currently lack. Exposure in the arts also increases their academic achievement, school and civic engagement; while lowering drop out rates and crimes committed. Successes in school and from exposure in the arts, can also help lead to positive economic results for the students, the community they live in, and for the government. In addition, it is more economically feasible to provide arts for at-risk youth, then to not have it at all or to provide some other program.

Through research and data, the project will make the claim and show that there should be more, not less, education and exposure in the arts for incarcerated and at-risk youth.

### **SYNTHESIS OF A NAPHTHOCARBAPORPHYRIN**

Presenter: Grabowski, Eric  
Student Class, Department: Graduate, Chemistry  
Mentor(s): Prof. Timothy Lash  
Author(s): Eric Grabowski, Timothy Lash

Carbaporphyrins are porphyrin analogues with one or more pyrrolic nitrogen replaced by a carbon atom. These aromatic systems have unusual reactivity, including the ability to generate organometallic derivatives under mild conditions. In order to extend the conjugation pathways

of carbaporphyrins, a naphthalene-fused carbaporphyrin 1 has been synthesized. This was accomplished by reacting dialdehyde 2 with tripyrrane 3 using an acid catalyzed "3 + 1"

MacDonald-type condensation. Reaction with silver acetate afforded the related silver (III) derivative 4.

### **HOW SATISFIED ARE FEMALE PARTICIPANTS IN A MIND BODY & SPIRIT GROUP?**

Presenter: Griffith, Kathleen  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Wehrmann  
Author(s): Kathleen Griffith

A Mind, Body & Spirit (MBS) curriculum is utilized at New Leaf Women's Inpatient addiction recovery center, and is provided to give women a choice between various approaches to enhance their recovery experience. The participants consist of women of all races, ages 18 and up, and of all ethnicities and socio-economic statuses. This curriculum serves to take a broader and more holistic view of recovery than standard approaches. The Mind, Body & Spirit curriculum focuses on scientific evidence and provides information and activities that encourage a holistic approach to recovery, and includes such topics as nutrition, neurotransmission and the effects of illicit substances on the neurons, meditation, spiritual principles, and much more. The curriculum is provided for women who are not participating in an evidence based PTSD/Addiction intervention called Seeking Safety. MBS is considered informational, rather than an intervention and thus, it provides an opportunity for women to learn about various approaches and tools that are not part of the normal "menu" of options through traditional addiction recovery models.

Survey methodology will be used to evaluate the overall satisfaction of the group's participants to assist the agency in assessing the current curriculum's strengths and to identify the weaker portions that warrant further revision. This is an exploratory study that will focus on the parts of the curriculum that participants found most and least helpful, and ask for descriptions of their own unique perspectives of the categories that they identify. A cross-sectional design was chosen due to the open enrollment of the group. Participants can enter the group at any point during the curriculum's 40 sessions. The purpose of this study is to explore clients' perceptions about what is most helpful to them in the curriculum so that it can be improved or adapted. A mixed method design was chosen, with a large portion of the questionnaire being qualitative in nature. This will provide an opportunity to incorporate the perspectives of the women who will experience the lessons in real time, thus giving the agency a tool for growth, while empowering women to have a voice and provided direction for the future.

### **CASA VOLUNTEER ATTRITION**

Presenter: Guerrettaz, Jamie  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Sheridan  
Author(s):

This program evaluation examines the factors that impact volunteer attrition among Court

Appointed Special Advocate (CASA) volunteers in McLean County. CASA relies solely on volunteers to provide supportive services to children in the foster care system and their families. CASA volunteers play a crucial role by advocating for children in foster care and ensuring their safety, permanency and well-being needs are met. The child welfare system and children in foster care are affected by attrition among CASA volunteers. A goal of this study is to identify attrition factors. Participants include both current and former CASA volunteers matched on specific characteristics that are hypothesized to be related to attrition including gender and age. Findings will aid in the development of supportive practices to eliminate barriers and increase necessary supports leading to volunteer stability.

### **TRAINING FOR CORRECTIONAL STAFF AND MENTAL HEALTH STAFF WORKING WITH MALE INMATES WITH SERIOUS MENTAL ILLNESS WHO ENGAGE IN SELF-INJURIOUS BEHAVIOR**

Presenter: Haag, Kelly  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Wehrmann  
Author(s):

The self-injurious behavior (SIB) of a growing number of male prison inmates has become a significant problem in U.S. correctional facilities. One group of researchers estimates that 30% of inmates engage in SIB at some time during incarceration. Research has identified a self-mutilation rate of 6.5% among male prison inmates. Prevalence rates may be inaccurate due to a lack of information on SIB recorded in inmate files. Regardless of the accuracy of existing data on prevalence, self-injurious behaviors-ranging from small cuts to suicide attempts-have threatened the safety of the inmate and have significantly strained the monetary and human resources of our country's penal institutions.

Inmates with serious mental illness (SMI) often have difficulty adjusting to the structure and culture of the prison environment and frequently engage in behaviors that result in disciplinary proceedings. The management of inmates with SMI engaging in SIB includes both security staff and mental health staff.

The safety of the inmate with SMI and the security of the correctional institution stands to be improved by expanding the knowledge base concerning SIB among inmates with SMI. Leaders in the field of Corrections have identified a lack of collaboration that complicates the treatment of SIB. One area of focus concerns the implementation of training for interdisciplinary staff on identification of SIB, treatment planning for these individuals, and evidence based treatments. Mental health leadership can develop training seminars and materials to increase awareness about SIB, standardize the language associated with SIB in the correctional environment and develop evidence based programming.

The purpose of this study is to measure the effectiveness of one particular training session on increasing baseline knowledge of SIB among male offenders with SMI within the correctional setting. Using a pretest-posttest model, students studying criminal justice and/or social work and/or psychology will be tested on knowledge of SIB among SMI inmates. Baseline knowledge will be garnered through pretesting. A forty-five minute presentation will be given on SIB among SMI male inmates in the correctional setting. A posttest will be administered to measure amount of knowledge gained on the topic presented. Posttest will include evaluation of the effectiveness of the presentation itself. Information collected and evaluated will be used to

further develop training programs on SIB among SMI male inmates within the correctional setting.

### **STAFF PERCEPTIONS OF THE EFFECTIVENESS OF CHILD AND FAMILY TEAM MEETINGS ON FAMILY ENGAGEMENT**

Presenter: Hall, Kirsten  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Wehrmann  
Author(s): Kirsten Hall

The primary goal of a family in foster care is to have their children returned home and function more effectively as a family unit. It is important that agencies do what is necessary to reunify families which can include family engagement through child and family team meetings. Much of the research done regarding family engagement with families in the child welfare system focuses on the beginning stages of a case when decisions are being made as to whether children should be removed from their home and placed in foster care and where those children should be placed if they are removed from the home. It is important to also look at what role family engagement plays throughout the life of a case and how much of an impact a caseworker can have on permanency outcomes by engaging the family throughout the entire case regarding service planning, the needs of the child, and building interpersonal relationships between treatment team members.

Data for this study was collected at two different points in time through surveys. The first survey was given to the participants via e-mail through Survey Monkey two weeks prior to the date of the child and family team meeting training in which they participated. The purpose of the survey was to measure the staff's perceptions of the effectiveness of child and family team meetings as they are being conducted currently. The participants were told that the survey needed to be completed by the date of the training. The participants then participated in a child and family team meeting training that discussed important aspects of a child and family team meeting such as the barriers to having them, the participants that need to be involved in the meeting, and the things that should be discussed during these meetings. Following the training, the researcher will co-facilitate a child and family team meeting with each of the participants for one of their cases. Following the co-facilitation of the child and family team meeting, each worker will be e-mailed another survey via Survey Monkey regarding his/her perceptions of the effectiveness of child and family team meetings on family engagement. The participants will be given two weeks to complete the survey. The results of the survey will be analyzed to determine if there was a statistically significant change in the participants' perceptions of the effectiveness of child and family team meetings on family engagement.

### **ANALYSIS OF SUBSTANCES RELEVANT TO CLANDESTINE DESOMORPHINE SYNTHESIS USING A PORTABLE MASS SPECTROMETER**

Presenter: Hall, Seth  
Student Class, Department: Graduate, Chemistry  
Mentor(s): Prof. Christopher Mulligan  
Author(s): Adam O'Leary, Christopher Mulligan

The opioid desomorphine recently attracted media attention following multiple suspected reports of its use in the United States. A codeine derivative, desomorphine has long been

prevalent in Russia and other former Soviet countries due to its ease of synthesis from the clandestine reduction of codeine obtained from pills in a manner similar to the clandestine synthesis of methamphetamine from pseudoephedrine. Injection of the drug, known by the street name of krokodil, results in scale-like disfigurements due to necrosis of the skin and nearby tissue caused by reagent and solvent impurities that remain after the synthesis. The rapid onset of symptoms and the potential for the drug to spread throughout the country necessitates the application of techniques capable of prompt analysis with unambiguous results. A field portable mass spectrometer equipped with a factory constructed desorption electrospray ionization (DESI) source has been applied to the rapid analysis of desomorphine and codeine residues upon surfaces of potential use in clandestine laboratories with minimal sample preparation. Additionally, the instrument was utilized for the analysis of a pharmaceutical pill of interest as a potential source of codeine.

Methods: All samples were analyzed using a Griffin AI-MS 1.2 cylindrical ion trap mass spectrometer. Requirements for MS analysis, including a helium CIT damping gas, a high voltage source, and a syringe pump for solvent delivery are all included in the instrument. Samples were prepared by spotting serial dilutions of chemical standards obtained from the Cerilliant Corporation or powders from pharmaceutical tablets upon surfaces.

### **INCUBATION BEHAVIOUR PRIOR TO CLUTCH COMPLETION IN EUROPEAN STARLINGS (STURNUS VULGARIS)**

Presenter: Hanser, Jason  
Student Class, Department: Graduate, Biological Sciences  
Mentor(s): Prof. Joseph Casto  
Author(s): Jason Hanser, Joseph Casto

In general, birds lay eggs over a series of consecutive days and begin incubation after the clutch is completed. However, in many species, females will often begin incubation prior to the completion of the clutch. Incubation prior to clutch completion causes eggs to hatch asynchronously and, consequently, later hatched individuals often experience greater mortality and slower growth rates. Despite hatching asynchrony being a widespread phenomenon across avian taxa and the subject of a considerable amount of research, we know surprisingly little about the patterns of incubation prior to clutch completion. Here, we present a comprehensive analysis of early incubation behavior in European Starlings.

### **PLAYING WITH A PURPOSE, PARENT/CAREGIVER AND CHILD INTERACTION EVALUATION**

Presenter: Harjung, Kelly  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Sheridan  
Author(s):

This evaluation will examine the effectiveness of the Play with a Purpose therapy group regarding parent/caregiver relationships and interactions. This study will explore the effectiveness of therapy activities to increase attachment and bonding in children and their parent/caregiver receiving services at Children's Home + Aid of Bloomington. Participants include clients of Children's Home + Aid and community members in the Bloomington area. Data collection includes an 11-item questionnaire with open-ended and Likert scale type questions regarding parents' interactions with their children prior to and after attending the Play with a



Purpose theraplay group. These findings will aid Children's Home + Aid as it will provide feedback for future groups and participants. This will allow for improvement in groups and better outcomes for participants.

### **RESEARCH TRAINING AND OPPORTUNITIES FOR PRACTICE WITHIN DOCTORAL PROGRAMS IN CURRICULUM AND INSTRUCTION**

Presenter: Herrmann, Derek  
Student Class, Department: Graduate, Teaching and Learning  
Mentor(s): Prof. Ellis Hurd  
Author(s): Derek Herrmann

There is evidence of a divide between educational research and practice, and graduate programs in education seem to be one setting where this divide is made known. Given this, the present study was conducted to examine the research training and opportunities for practice that are provided to students in doctoral programs within one field of study in education. The program requirements related to research and practice and descriptions of the doctoral programs were gathered from their institutions' graduate catalogs. The goals, objectives, and/or outcomes related to research also were gathered from the program or unit assessment plans. The findings indicated that although requirements related to research training vary between doctoral programs, they constitute a strong component of the programs; opportunities for practice, however, do not seem to be encouraged as strongly. The limitations, implications, and future directions based on these findings are discussed.

### **WHAT INTERVENTIONS WOULD MITIGATE THE CYCLE OF ABUSE AMONG CHILDREN EXPOSED TO DOMESTIC VIOLENCE?**

Presenter: Higginbothan, NiCole  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Wehrmann  
Author(s):

Domestic violence is a devastating social problem that impacts every member of the family, including children. It creates a home environment where children live in constant fear and leaves them unable to establish nurturing bonds with either parent. While greater attention has been given to domestic violence in recent history, it has been a part of family life for very long time. Most available research has been written within the last two decades demonstrates a much greater concern for the issue. Public knowledge of the effects of domestic violence on society at large has increased significantly and has influenced everything from domestic violence service prevention to child welfare legislation. Some of the most significant advances in recent years have been in the area of child witnesses and the effects of domestic violence on their overall well-being (Buckely, Holt & Whelan, 2007). Child exposure to domestic violence has increasingly become a concern for practitioners and researchers. , new research in child welfare systems has revealed that large proportions of children under protective supervision are exposed to domestic violence but that screening and investigation of the violence is often inadequate (Edleson, Ellerton, Seagren, Kirchberg, Schmidt & Ambrose, 2007). Juvenile and family courts struggle to understand and assess the significance of child exposure when making decisions concerning custody and visitation. Professionals working in domestic violence prevention programs have little guidance and few tools to carefully assess exposed children so that they can target new policies and practices to best serve them. This study will involve a

record review to determine what interventions mitigate the cycle of abuse among children exposed to domestic violence. It is anticipated that the findings will be beneficial to child welfare practitioners, the agency and its clients.

### **FITNESS-RELATED COSTS OF INCREASING EGG PRODUCTION IN FEMALE HOUSE WRENS (TROGLODYTES AEDON)**

Presenter: Hodges, Christine  
Student Class, Department: Graduate, Biological Sciences  
Mentor(s): Profs. Charles F. Thompson, Scott K. Sakaluk  
Author(s): Charles F. Thompson, Scott K. Sakaluk

Understanding the relationship between reproductive effort and parental fitness has long been a goal of life-history theory. Trade-offs of resource allocation between parents and their offspring can directly influence current and future reproductive effort. David Lack first hypothesized that the clutch size of altricial birds is shaped evolutionary by the demands of chick rearing, and that birds are selected to produce the maximum number of young for which they can provide food. However, many brood-manipulation studies have disproved Lack's hypothesis, with the attention shifting to the hypothesis that clutch size may be limited during the egg-production or incubation stages of the breeding cycle.

In a preliminary study, I induced female house wrens to lay and incubate additional eggs and to raise the additional young hatching from those eggs during their first brood in May. Females producing enlarged clutches during the first brood laid the same number of eggs in the second brood as unmanipulated females, but produced fewer offspring that survived to leave the nest. These results suggest that an inability to provide sufficient food to their nestlings may limit the number of offspring a female can raise. Therefore, I tested the hypothesis that the number of offspring a female can successfully raise is limited by the cumulative effect that extra egg production and incubation effort has on her ability to provide food to her nestlings. I predicted that experimental females that were induced to produce 3-4 extra eggs and given a food supplement during the nestling provisioning period would (i) produce more offspring of greater quality, (ii) be more likely to produce a second brood, and (iii) be in better body condition than experimental females not receiving a food supplement.

### **EXAMINING THE CAMBODIAN AND RWANDAN GENOCIDES: HOW PERCEIVED JUSTICE PLAYS A SIGNIFICANT ROLE ON SURVIVORS PSYCHE**

Presenter: Howe, Jacqueline  
Student Class, Department: Undergraduate, Politics and Government  
Mentor(s): Prof. Michaelene Cox  
Author(s):

Cambodia and Rwanda genocides display comparable similarities and differences. The horrors in Cambodia began in 1975 when the Khmer Rouge guerrillas began a war against their own people. Although the genocide only lasted four years, the impact on the population was severe. With nearly two million dead, twenty percent of the country's population no longer existed. The effects on the Cambodia people psyche have been extreme. Genocide also spread to the country of Rwanda as recently as 1994. The Rwandan people, specifically the Tutsis, were murdered by the hundreds of thousands by their Hutu brothers. The damage to their

psychological state is unimaginable. The geographical distance and nearly 20 year time span difference creates comparable circumstances between the two genocides.

Since these traumatic circumstances exist, it is necessary to examine how these events impacted the survivors within Cambodia and Rwanda. These survivors will be the individuals who will come together to rebuild a hurt and corrupt nation. For this study's purpose, I will consider survivors or victims to be those who have directly survived genocide attacks. Examining the psychological impact on the survivors of these tragedies can help paint a picture of how exactly these societies as a whole will be able to rise up from the devastation. Psychological impact or traumas will be discussed throughout this paper to mean various disorders, disabilities, or traumas (like Post-traumatic Stress Disorder, depression, or witnessing the murder of a family member) that in any way inhibit victims of genocide. This paper specifically argues that scrutinizing the psychological impact on the survivors of genocide as well as an analysis of the perceived justice these survivors received afterward, all play a role in the reconciliation of these horrific circumstances. Justice, as stated above and for this paper's purposes, means to uphold the law and to manifest appropriate punishments and rewards. By performing a brief overview of the literature provided on the psychological impact and the justice given specifically to the survivors of these traumas, I hope to use a network analysis to suggest that further preventative measures, psychological treatments, and political and social justice are necessary for these survivors to move on.

#### **ENZYMATIC HYDROLYSIS OF N-TRIFLUOROACETATE BY ACYLASE I: A 19F-NMR KINETICS EXPERIMENT**

Presenter: Huffman, Samantha  
Student Class, Department: Undergraduate, Chemistry  
Mentor(s): Prof. Steven Peters  
Author(s):

An experiment using 19F nuclear magnetic resonance (NMR) spectroscopy was developed to investigate the catalyzed hydrolysis of commercially available N-trifluoroacetyl glycine (TFAG) using the enzyme acylase-I. The products formed from this hydrolysis are N-trifluoroacetate (TFA) and glycine. The change in the 19F resonance for both the substrate (TFAG) and the product (TFA) can be monitored throughout the course of the catalyzed reaction. The rate of hydrolysis has been determined at different TFAG substrate concentrations. Analysis of the 19F NMR data using Michaelis-Menten kinetics and Lineweaver-Burke plots were used to determine  $K_M$  (Michaelis constant),  $V_{max}$  (maximum velocity) and  $k_{cat}$  (catalytic constant). This experiment has been developed for the ISU Chemistry Department's new physical biochemistry laboratory course.

#### **EMBRACING DIVERSITY AND SUPPORTING STUDENT NEEDS IN URBAN CLASSROOMS**

Presenter: Ildefonso, Abigail  
Student Class, Department: Undergraduate, Teaching and Learning  
Mentor(s): Prof. Miranda Lin  
Author(s):

With diverse classroom populations in urban schools comes the need for strategies to address

various class needs as well as embracing diversity. These methods typically fall into five categories: classroom environment, parent involvement, meaningful discussions, community engagement, and diverse literature. Classroom environment includes, but is not limited to, purposeful student groupings and seating arrangements, classroom displays that highlight a variety of cultures and backgrounds, and positive reinforcement and feedback. Parent involvement also includes extended families and relatives; additionally, it may come in the form of parents working with their children in the classroom, parents presenting information to the class, and parents working with one another. Similarly, community engagement can involve guest speakers as well as school-wide activities for the community. Meaningful discussions center around familiarizing students with settings and backgrounds outside of their own in addition to broadening their knowledge of diversity through the introduction of new topics and ideas. Lastly, literature includes specific titles used by classroom teachers to embrace diversity and special sections and displays for authors and books from around the world.

A class of twenty-five early childhood education students from Illinois State University was divided among four elementary schools in Chicago. These classrooms have students who are Somalian and Nepalese refugees as well as students who speak Tagalog, Urdu, Arabic, Vietnamese, Hindi and Spanish as their first languages. After a morning of observing these students, the Illinois State University students were asked to conduct teacher interviews with the classroom teachers about their experiences and methodologies used while working with diverse groups of students. These classroom teachers provide the basis of this research into engaging and supporting classrooms with diverse populations and needs based on the various backgrounds of its students.

#### **THE DESIGN, SYNTHESIS, AND APPLICATION OF ALPHA-AMINO ACID DERIVED DIPHENYLPHOSPHINOBENZAMIDES ANCHORED BY OXAZOLIDINONE SCAFFOLDS**

Presenter: Janci, Elise  
Student Class, Department: Undergraduate, Biological Sciences  
Mentor(s): Prof. Shawn Hitchcock  
Author(s): Elise Janci, Shawn Hitchcock

This research is focused on the development of chiral phosphine ligands. These ligands will be constructed around an  $\alpha$ -amino acid core of either L-valine or L-phenylalanine. The  $\alpha$ -amino acid will be protected with the CBz protecting group and then coupled with an oxazolidinone scaffold. The amino group of the amino acid will be deprotected under hydrogenolysis conditions and then acylated with ortho-diphenylphosphinobenzoic acid using the Steglich reaction with a carbodiimide, catalytic dimethylaminopyridine under water free conditions. Once the synthetic target phosphines are in hand, we will ultimately pursue the application of these compounds through reaction with the test substrate 1, 3-diphenylpropenyl acetate. This poster will outline the evolution of this project, the work that has been accomplished, and the future directions that will be pursued.

## **CONTENT OF ADOLESCENT DISCLOSURE AND RELATIONS TO PARENT-ADOLESCENT ATTACHMENT**

Presenter: Kasky-Hernández, Lynda  
Student Class, Department: Graduate, Psychology  
Mentor(s): Prof. Jeffrey Kahn  
Author(s): Lynda Kasky-Hernández, Jeffrey Kahn

This research project examined what adolescents disclose to their parents and how attachment to the parent relates to this disclosure. Participants included 262 college students ages 18 and 19 years old ( $M = 18.53$ ). Participants completed the Content of Self-Disclosure Scale (CSDS), a self-report measure developed for this study. The CSDS contained disclosure categories from Smetana et al. (2006) (e.g., moral, conventional, prudential issues), as well as additional items for more breadth and relevance to college students (e.g., academic performance, peer relations, dating relationships, how free time is spent, risky behaviors). Respondents were asked to complete the CSDS for their same-sex parent or parent-like figure. Participants also completed the Experiences in Close Relationships-Relationships Structures (ECR-RS) Questionnaire designed to measure attachment to significant others, including the same-sex parent (Fraley, Heffernan, & Vicary, 2011). Results indicated that there are significant differences in the adolescent-reported level of self-disclosure of different content to parents. Daughter-to-mother disclosure means were higher than means for son-to-father disclosure for all scales, with the exception of Alcohol and Other Drugs. Results also indicated that avoidantly attached adolescents tend to disclose less to parents. Findings of this study are relevant to school psychologists who work with adolescents and their families. Promoting adolescent self-disclosure to parents might play a causal role in promoting a strong parent-adolescent bond. Further, this study provides a better understanding of the ways disclosure of specific content areas is related to adolescents' attachment to parents.

## **EXPLORING SOCIALLY DESIRABLE RESPONDING IN MEASURES OF FINANCIAL BEHAVIOR**

Presenter: Kelly, Nicole  
Student Class, Department: Graduate, Family and Consumer Sciences  
Mentor(s): Prof. Tammy Harpel  
Author(s):

Financial well-being is a function of individual characteristics, financial behaviors, and financial stressor events (Kim et al. 2003). Most college students arrive on campus and begin to deal with new challenges of personal finance management such as paying bills, developing a budget, and using credit for the first time (Gutter, Garrison, & Copur, 2010). Many college students borrow a sizable amount of money for the first time and must begin to effectively manage debt (Gutter & Copur, 2011). Concern about the financial state of young people and their ability to make wise financial decisions in adulthood has gained interest among family and consumer science professionals, higher education institutions, financial educators, and legislators.

Most of the information we have about human behavior comes from self-report measures through surveys. Self-report surveys are a primary method used by consumer finance researchers to collect information about financial behaviors from participants. Given the fact that respondents are often unwilling to report accurately on sensitive and private topics, the resulting data is systematically biased. A noted concern is that respondents might not respond

truthfully but simply provide answers that make them look good. This type of response bias is a phenomenon known as *socially desirable responding* (SDR) (Paulhus, 1991).

One questioning method employed by researchers that use self-report surveys is called indirect questioning (IQ). These are structured or unstructured questions used as a means of reducing the effects of social desirability bias. The indirect questioning technique uses projective questioning which asks participants to respond to questions from a third-person perspective (Fisher, 1993). By instructing respondents to report on the nature of a *typical* other rather than about themselves, indirect questioning potentially mitigates the distortion of privately held attitudes.

Despite awareness among financial researchers that financial management is a more sensitive topic, there is an absence of studies that have employed methods to account for the presence of SDR bias in financial research literature. The scenario-based form of IQ could highlight the existence of SDR bias in consumer finance research. This survey study will explore the role of socially desirable responding in student self-reports of financial behavior. More specifically, the study will examine the differences among participants' direct and indirect questioning responses about financial behavior. Ultimately, this study aims to further the methodological sophistication of self-report surveys, leading to more accurate representation of financial variables.

#### **INVESTIGATION ON STUDENTS' AWARENESS IN HIGH PERFORMANCE GREEN BUILDING DESIGN THROUGH ENERGY SIMULATION**

Presenter: Kern, Jake  
Student Class, Department: Undergraduate, Technology  
Mentor(s): Prof. Borinara Park  
Author(s): Jake Kern, Borinara Park

Recently, the cross-disciplinary nature of energy-efficient building design has created many challenges for students to become fully aware of green building initiatives. One of the technical challenges in teaching sustainable building design is enabling students to quantitatively understand how different building designs affect a building's energy performance. Concept-based lecture-oriented instructional methods fall short in evaluating the impact of different design choices on a buildings' energy consumption. Energy performance software provides a feasible tool to evaluate building design parameters. This research reports how students perceived the energy simulation modeling as a potential tool to enhance their energy consciousness in their future profession.

#### **METHAMPHETAMINE USE: THE EFFECT ON THE CHILD FROM WOMB, BIRTH AND BEYOND.**

Presenter: Keune, Chiara Lauren  
Student Class, Department: Graduate, Criminal Justice Sciences  
Mentor(s): Prof. Ralph Weisheit  
Author(s):

Globally the use of methamphetamine surpasses that of heroin and cocaine combined. As a

drug that facilitates weight loss and provides the user with increased energy, it is particularly appealing to women. This raises concerns about its use by pregnant women. This poster highlights what is known about the effects of methamphetamine by pregnant women on the unborn child, and on the long term consequences for the children of these women.

### **B-AMIDOESTERS AS CHIRAL MONOPHOSPHINE LIGANDS: ENANTIOMERICALLY DIVERGENT PATHWAYS IN THE TSUJI-TROST REACTION**

Presenter: King, Jalisa  
Student Class, Department: Undergraduate, Chemistry  
Mentor(s): Prof. Shawn Hitchcock  
Author(s):

The Tsuji Trost reaction is a asymmetric allylic alkylation. This is the phenomenon where a chiral catalyst promotes the conversion of an achiral substrate to a chiral product with a preference for the formation of one of the mirror image isomers. Using a single chiral scaffold, either (1R,2S)-norephedrine or (1R,2S)-2-amino-1,2-diphenyl-1-ethanol, a series of monophosphine ligands have been prepared for application in the Tsuji-Trost reaction. The ligands that have been prepared, b-O-acyloxy-(o-diphenylphosphino) amides and b-O-amido-(o-diphenyl phosphino)esters, give rise to enantiomerically divergent products in the Tsuji-Trost asymmetric allylic reaction. The phosphinoamides afforded the best enantioselectivities and favored the (S)-enantiomer of the product. In contrast the phosphinoesters afforded lower enantioselectivities that favored the (R)-enantiomer. A mechanistic rationale for this observation is proposed.

### **THE USE OF TECHNOLOGY IN KINDERGARTEN CLASSROOMS IN REGARDS TO TEACHING BEGINNING LITERACY**

Presenter: Kinkelaar, Diana  
Student Class, Department: Graduate, Teaching and Learning  
Mentor(s): Prof. Sherry Sanden  
Author(s):

In an ever changing world, technology seems to be evolving and driving the educational field. This has presented new ideas, information, and forms of teaching that are now being required within districts and diocese. But is this always a good thing? This topic is a very hot issue as it presents many mixed feelings and little research as applications, iPads, and Leapsters are still fairly new within the Early Childhood Education (ECE) classrooms. Although these forms of technology can be a wonderful tool to help children learn beginning reading concepts, they are often misused and overused creating an addiction to this form of learning where students are unable to focus on a book that doesn't have background music, level ups, and interactive avatars. How do Kindergarten teachers teach beginning literacy skills in their classrooms using technology and still make the lesson effective for all learners? Thomas Edison said: "Books will soon be obsolete in the schools... It is possible to teach every branch of human knowledge with the motion picture. Our school system will be completely changed in the next ten years" (Reiser, 2001, p. 55). Are Kindergarten teachers relying heavily on technology to teach literacy? What types of technology are Kindergarten teachers using to teach beginning literacy skills? The purpose of this study is to explore the use of technology in the Kindergarten classroom in regards to attempts to advance beginning literacy skills through semi-structured interviewing resulting in a narrative of themes and patterns.

## **MONSOON**

Presenter: Klabisch, Collin  
Student Class, Department: Undergraduate, Psychology  
Mentor(s): Prof. Jeffrey Wagman  
Author(s):

For most people, movements are visually guided. People can see obstacles in their path, openings to be passed through, and barriers that need to be ducked under and control their movements accordingly. However, visually impaired individuals must use perceptual systems other than vision for this purpose. In this series of experiments, blindfolded participants used a wooden dowel to explore an inclined surface and reported whether it would be possible for them to stand on that surface. In the first experiment, participants explored the surface with the dowel held in their preferred hand while standing on one foot or on both feet. In the second experiment, participants sat while exploring the surface with the dowel held in their hand or attached to their foot. In the third experiment, participants explored the surface with the dowel attached to their foot while sitting and while standing. Across the three experiments, participants were able to successfully differentiate those surfaces that could be stood on from those that could not, and perception of whether the surface could be stood on reflected the ability of the participants to perform the task.

## **GOING TO EXTREMES - DIMENSIONAL PERSONALITY DISORDERS IN ADOLESCENTS?**

Presenter: Klieme, Katrin  
Student Class, Department: Graduate, Psychology  
Mentor(s): Prof. Kimberly Schneider  
Author(s): Fritz Ostendorf

**Purpose:** The shift towards a dimensional rather than categorical conceptualization of personality disorder (PD) has been widely accepted as scientific consensus for several years (Skodol et al., 2011; Widiger, Livesley, & Clark, 2009; Widiger & Mullins-Sweatt, 2010). Different models have been introduced in this regard, including both models that comprise solely maladaptive traits, as well as models that integrate adaptive and maladaptive traits under the established Five Factor Model. Recently, modifications to personality disorders in the DSM-V have manifested this change of paradigm. Concomitantly, research has turned to a focus on trait antecedents and the validity of dimensional PD in adolescents (Tromp & Koot, 2010). This study addresses this issue using a newly developed German item pool that was derived from the DAPP-BQ (Livesley & Jackson, 2009) and titled "Questionnaire for the assessment of accentuated personality traits in adolescents" (FAPM-J, Klieme & Ostendorf, 2011).

**Procedure:** One hundred ninety 12 to 18-year old German adolescents were included in this study. Self and parent ratings ( $n = 92$ ) on both the maladaptive (FAPM-J) and adaptive personality inventories (HiPIC, Bleidorn & Ostendorf, 2009) were assessed to explore the construct validity of applying a dimensional model of PD to an adolescent population. MTMM matrix analyses following Campbell and Fiske (1959) analyzed convergent and discriminant validity between four common factors of adaptive and maladaptive traits. The correlation matrix comprised these four personality traits measured by four methods (self-rating and parent-rating on FAPM-J and HiPIC). Subsequently, a model integrating adaptive and



maladaptive traits into a comprehensive framework according to the dimensional conceptualization of PD was developed and proposed (see Figure 1).

Results: The matrix analysis indicated satisfactory validity of the construct for the adolescent population (see Table 1).

Correlation patterns displayed higher congruence between tests than between raters, supporting a dimensional model. Nonetheless, the traditional MTMM analysis lacks systematic modeling of method influence and, thus, calls for confirmatory analyses in an upcoming analysis with a validation sample.

Conclusion: By proposing a confirmatory model that builds upon previous exploratory findings, this study introduces an important next step in understanding dimensional conceptualizations of adolescent PD. The composition of the four dimensions of the FAMP-J is congruent with dimensional PD structure in adults, but not identical. Thus, future research could help investigating adolescent idiosyncrasies and continuity of maladaptive traits and, thus, foster chances for preventive interventions.

### **IMMEDIATE AFFECTS OF A [OPEDIX] PROPHYLACTIC KNEE SUPPORT ON FRONTAL PLANE KNEE KINEMATICS AND KINETICS DURING WALKING**

Presenter: Koldenhoven, Rachel  
Student Class, Department: Undergraduate, Kinesiology and Recreation  
Mentor(s): Prof. Michael Torry  
Author(s): Philip Mathew, Anthony Humble-Guither, Ashley Luman, Jacque Jones

Knee supports (unloader braces and neoprene sleeves) are often employed to decrease medial knee jointloading and/or pain in persons with medial knee osteoarthritis. It is compelling that these alterations would also be considered beneficial in healthy individuals. Yet, the comfort of a brace/sleeve in a younger active population may pose compliance issues. Retail apparel with 'built-in knee supports' are being advocated to increase compliance in such cases. Purpose: To determine if a [prophylactic] knee support garment (Opedix Labs, Phoenix, AZ) alters frontal plane knee mechanics in healthy females during walking.

Methods: Nine females ( $21 \pm 1$  yrs;  $59.6 \pm 3.7$  Kg;  $1.63 \pm 0.8$  m) performed five walking trials with and without the Opedix knee support garment. Subjects walked at self-selected speed, cadence and step length were controlled via step length 'marks' demarcated on a 10 m walkway between conditions. Lower limb knee kinematics and kinetics were obtained and the external knee adductor joint moment was calculated. Conditions between with garment and without garment were compared with paired t-Tests. Results: The garment caused a  $7.4^\circ$  increase in sagittal plane knee flexion angle ( $p < .001$ ) and a  $1.4^\circ$  reduction in frontal plane knee adductor angle ( $p < .001$ ) at the time of the peak adductor moment. The peak adductor moment decreased slightly but was not significant ( $p = .21$ ). The peak vertical ground reaction force which dominates the adductor moment increased slightly ( $p = .25$ ). Conclusion: The garment influenced the sagittal and frontal knee kinematics but did not alter the adductor moment.

## **USING MOVIES TO TEACH MOTIVATIONAL CONCEPTS: A CONTENT ANALYSIS OF 7 MOVIES**

Presenter: Koppel, Rachael  
Student Class, Department: Undergraduate, Psychology  
Mentor(s): Prof. Alexandra Ilie  
Author(s):

Movies can represent a powerful tool for educators to use in classrooms. In the current paper, we analyzed 7 movies for concepts related to an advanced undergraduate class in Human Motivation. Movies included Lord of The Rings, Harry Potter, The Diary of Anne Frank, Equilibrium, Cast Away, Freedom Writers, 127 Hours. Several concepts were identified such as emotions as motivations, intrinsic motivation, extrinsic motivation, psychological needs, physiological needs, self-efficacy, social needs, and growth motivation. Implications of using movies in the classroom will be discussed.

## **TESTING OF SURFACE ENHANCED RAMAN SPECTROSCOPY ON PLASMONIC COUPLED GOLD NANOPARTICLES**

Presenter: Larrick, Carleigh  
Student Class, Department: Undergraduate, Chemistry  
Mentor(s): Prof. Jeremy Driskell  
Author(s): Carleigh Larrick

Surface Enhanced Raman Spectroscopy (SERS) was used to investigate plasmonic coupling between gold nanoparticle (AuNP) and a gold film. Nitrobenzenethiol (NBT) modified AuNP immobilized with antibody-antigen interactions were compared to AuNP immobilized via 11-amino-1-undecanethiol hydrochloride (AUT) and aminoethanethiol (AET). It is hypothesized that lengthier spaces between AuNP and underlying film will correlate to reduced intensities compared to shorter gap distances. As theorized, the SERS signal intensities increased with decreasing gap distance i.e. three proteins, two proteins, AUT and AET. Interestingly, the SERS intensities of the protein immobilized AuNP varied based on samples' hydrated states. Greater SERS signal was collected for dry samples than hydrated samples. This effect was attributed to change in protein size with change in hydration. This will aid in identifying and solving potential limitations in bio-assay development.

## **INCONSISTENCIES DURING MINUTE-BY-MINUTE STEP COUNTING USING THE SENSEWEAR MINI ARMBAND**

Presenter: Lee, Joey  
Student Class, Department: Graduate, Kinesiology and Recreation  
Mentor(s): Prof. Kelly Laurson  
Author(s): Joey Lee, Kelly Laurson

The SenseWear Mini Armband (SWA) is an activity monitor that estimates energy expenditure, step counts, sleep duration and efficiency, and time spent in activity zones. Many of these metrics have been reported on and show promise, but data on the SWA step count metric is

limited.

**PURPOSE:** The purpose of this study was to validate the SWA step counts during treadmill walking, jogging and running.

**METHODS:** A convenience sample of college-aged adults participated in the study (n = 31; 18 males, 13 females). Subjects wore a SWA while performing three-minute stages of treadmill walking (at 80 and 107 m·min<sup>-1</sup>) and self-selected paces of jogging and running while a researcher hand-tallied steps. Two-minute periods of no movement were used between stages.

**RESULTS:** The intraclass correlation coefficients (ICC) between manually counted steps and the SWA were weak and not statistically significant (all p > 0.05). The SWA step counts were underestimated by 17.1% during walking (both speeds), 18.4% during jogging and 16.9% during running (all p < 0.05). However, these results were found when analyzing the data utilizing the exact minutes the stages were completed (e.g. 3:05 - 3:08). By including the minute of non-activity prior to the start of the

three minutes stage (i.e., including 4 minutes of monitoring even though the stage was 3 minutes in length), step counts were more accurate compared to manually counted steps. ICC's from the 4-minute analysis were moderate-to-strong at all speeds, r = 0.729, 0.711, 0.819 and 0.786 (all p < 0.001) at 80 m·min<sup>-1</sup>, 107 m·min<sup>-1</sup>, jogging and running, respectively. The difference from manually counted steps improved to an underestimation of approximately 3-5% during the four stages.

**CONCLUSION:** When analyzing step count data on a minute by minute basis, the SWA may have an issue with the internal timing. Further research observing this phenomenon is warranted, including investigations into the other measures of activity by the SWA (such as caloric expenditure). Nevertheless, it appears as though the SWA is capable of accurately quantifying steps if the time-frame is adjusted within the software.

## **A MULTILEVEL EXAMINATION OF PATROL OFFICER JOB SATISFACTION**

Presenter: Lee, Sung Uook  
Student Class, Department: Graduate, Criminal Justice Sciences  
Mentor(s): Prof. Jason Ingram  
Author(s):

Sergeants represent an important managerial role in police organizations. Research, however, on this role has historically been underdeveloped. Although more recent investigations have begun to examine supervisory influences on officer attitudes and behaviors, the link between supervision and job satisfaction remains largely unexamined. As a result, this paper examines the impact of sergeants on patrol officer satisfaction levels. Using survey data from a multisite, federally funded project, we examine whether sergeant characteristics and styles influence officer satisfaction levels while controlling for key individual officer variables. Based on the results, research and practical implications are discussed.

## **EXPRESSIONS OF PREJUDICE: WHAT QUALITIES CHILDREN DISLIKE IN PEERS**

Presenter: LeFever, Christine  
Student Class, Department: Graduate, Psychology  
Mentor(s): Prof. John Pryor  
Author(s): Christine LeFever, John Pryor

This study examined the relation between the expression of children's prejudice and the qualities they believe are okay to like or dislike in peers. Results indicated that children believe it's acceptable to dislike peers who display antisocial behaviors and it's unacceptable to dislike peers with qualities viewed as outside of their control. Session attendees will learn about the connection between prejudice, social norms, and how negative views are expressed.

### **OPTICALLY ACTIVE METAL NANOPARTICLES AS A SUBSTRATE FOR SURFACE ENHANCED RAMAN STUDY**

Presenter: Legner, Christopher  
Student Class, Department: Undergraduate, Chemistry  
Mentor(s): Prof. Jun-Hyun Kim  
Author(s): Christopher Legner, Jamie Sullivan, Brett Boote, Jun-Hyun Kim

We report a simple synthetic approach to prepare various mono and bimetallic nanoparticles possessing strong and tunable absorption properties. The diameters and shapes of these nanoparticles were systematically controlled by the initial molar ratio of metal ions (i.e., silver or gold) and reducing agents as well as surfactants at room temperature. The reliable formation and optical property of these nanoparticles were thoroughly examined by UV-visible spectroscopy, scanning/transmission electron microscopy, and dynamic light scattering. The resulting optically active nanoparticles in solution and on substrate were tested in a Raman spectroscopy study and their sensitivities were systematically compared to conventional gold and/or silver nanoparticles.

### **GIRLS' BEHAVIORAL RESPONSES TO BEING LEFT OUT OF A GAME**

Presenter: Leja, Ashley  
Student Class, Department: Graduate, Psychology  
Mentor(s): Profs. Steven Landau, Eric Wesselmann  
Author(s): Eric Wesselmann, Steven Landau

Relational aggression and bullying have been studied extensively by researchers in recent years. Ostracism - being ignored and excluded - is a form of relational aggression that is often overlooked, but possibly more harmful than other forms of aggression. This study examines 34 middle-school aged girls' ingratiating behaviors after being excluded or included during a computerized ball toss game. Results will also examine the moderating role of socio-cognitive individual difference variables on these behaviors.

### **ONLINE AND FIELD CLINICAL OBSERVATION: A COMPARISON STUDY**

Presenter: Little, Savannah  
Student Class, Department: Undergraduate, Communication Sciences and Disorders  
Mentor(s): Prof. May Jadallah  
Author(s): Kyle Miller, Beth White, Carolyn Hunt, Barbara Meyer

For this research project, the authors' intent was to determine which type of classroom observation style was preferred and most effective for TCH 210 students at Illinois State

University - online observations through Methods of Effective Teaching Extension (MET Ex), or field observations generally completed at the university laboratory schools in K-12 classrooms. A measuring tool, in this case, a survey, was created specifically for TCH 210 students to express their opinions about these two observation methods by use of the Likert Scale, Yes and No questions, and open ended questions that allowed students to fully express their opinions and the reasons behind them. The survey, entitled, Online and Field Clinical Observation: A Comparison Study, consisted of 12 questions. Out of 260 TCH 210 students in the Fall 2013 semester, 122 responded to the survey for a response rate of 47%. Out of 122 respondents, 23 students did not complete MET Ex observations, leaving the researcher with 99 respondents who completed both MET Ex online observations and field observations. Initial review of the data from the Likert Scale questions leads the researchers to conclude that more students Strongly Agreed and Agreed that the field observations in laboratory schools were beneficial to them than those who Strongly Agreed or Agreed that the MET Ex observations were beneficial to them as students. Along this same thread, there were many more positive responses to the open-ended questions asking about the strengths of the laboratory school observations than the open-ended questions asking about the strengths of the MET Ex observations. The rest of the data follows along this same theme and will be further discussed in regards to commonalities and correlations amongst the 122 student responses.

#### **INVESTIGATING EPIZOOCHORY AS A SEED DISPERSAL MECHANISM OF GARLIC MUSTARD (ALLIARIA PETIOLATA)**

Presenter: Loebach, Chris  
Student Class, Department: Graduate, Biological Sciences  
Mentor(s): Prof. Roger Anderson  
Author(s): Chris Loebach, Roger Anderson

Garlic mustard is an herbaceous plant that has aggressively invaded woodlands in North America. Garlic mustard displaces native ground layer vegetation and reduces native species diversity and is considered to be a major threat to forest ground layer species. Garlic mustard has been well studied in order to understand its community impact and for the development of control methods, but one critical aspect that has not been studied are seed dispersal mechanisms. External mammal transport (epizoochory) has often been cited as a dispersal mechanism, but it has never been explicitly tested. That is the goal of this study. To test for epizoochory, a randomized block design was used in the field. Each block contained a mammal inclusion treatment (MIT) and a control. The MIT was designed to attract the activity of mammals the size of a raccoon or smaller over a germination tray filled with potting soil while the control excluded all mammal activity. In the summer of 2013, four blocks were placed at the edge of three garlic mustard patches, one in each in the cardinal directions from the center of the patch. After the majority of seeds were dispersed, the trays were collected and brought to Illinois State University to overwinter outdoors because cold-moist stratification is necessary for seed germination. In spring 2014, the number of garlic mustard seedlings will be counted. If epizoochory is a dispersal mechanism, then there should be significantly more seedlings in the MIT trays than the control trays. Non-garlic mustard seedlings were counted this past fall, and the MIT contained an average of 6.6 ( $\pm 2.86$ ) seedlings compared to 2.4 ( $\pm 0.82$ ) in the control. While this difference was only marginally significant ( $F(1,10.76)=6.64$ ,  $p=0.026$ ), it does suggest that seeds were transported by mammals into the MIT. If this trend is also true for garlic mustard seedlings, then the hypothesis that epizoochory is a dispersal mechanism will be

supported.

### **SERS BASED IMMUNOASSAY USING GOLD NANOPARTICLES WITH VARIOUS CONCENTRATIONS OF ANTIGEN**

Presenter: Lopez, Arielle  
Student Class, Department: Undergraduate, Chemistry  
Mentor(s): Prof. Jeremy Driskell  
Author(s): Arielle Lopez, Jeremy Driskell, Lindsey Cermak

A diagnostic assay is developed using surface enhanced Raman spectroscopy (SERS) to detect biomolecules with gold nanoparticles. The gold nanoparticles are coated with goat anti-mouse IgG antibodies using DTSSP as a binding agent and the Raman dye nitrobenzenethiol. Free nanoparticles do not express a detectable Raman signal. In the presence of antigen, the nanoparticles come together to form aggregates, causing a strong signal from gold enhanced nitrobenzenethiol. Initial studies used Dynamic Light Scattering (DLS) to observe the antigen concentration range which effectively induces nanoparticle aggregation, and it was determined that an antigen concentration of 100 ng/mL produced optimal aggregation. While effective, formation of aggregates is only observable for a single antigen using DLS; therefore SERS will be used to study aggregation kinetics and will be used as a means to develop a multiplex assay. In an effort to optimize the assay and achieve a better limit of detection, gold-plated filters will be explored as a method of capturing and concentrating the nanoparticle aggregates for SERS detection.

### **A REVIEW AND ANALYSIS OF INTERVENTIONS AND SERVICES FOR DEAF STUDENTS WITH AUTISM SPECTRUM DISORDERS**

Presenter: Mateyka, Rachel  
Student Class, Department: Undergraduate, Special Education  
Mentor(s): Prof. Christy Borders  
Author(s):

In the world of special education, there is a long list of different interventions to try with students with disabilities. Some are more successfully and consistently delivered for students with a specific disability. However, many times students have more than one disability. When this occurs, it becomes increasingly difficult to identify and implement strategies. Teachers may be left asking, "Which disability do I address?" when searching out intervention strategies for students who fall into multiple categories. In this project, I chose to analyze data collected from around the state of Illinois in the hopes of discovering whether certain educational labels influenced what interventions were recommended or used.

All data collected and analyzed were provided by the Illinois Service Resource Center (ISRC) and had all personal identifiers removed prior to being provided to Dr. Borders. The data includes information gathered on several school-aged children from Illinois that are both deaf/hard of hearing (DHH) and have an Autism Spectrum Disorder (ASD). These are the two disability labels upon which I focus my analysis. I will analyze the data in terms of primary and secondary disability label to determine if one primary disability label is receiving differing interventions and services from the other. For example, if a student's primary disability is ASD, are they receiving something more than or different than a student whose primary disability is DHH? I will analyze data in two different ways: initially a total number of recommended interventions will be

compared across the two different groups based on primary disability label through a independent samples t-test; secondly, a qualitative analysis will be conducted to determine if the types of interventions recommended differ between the groups.

Through this research, I hope to discover if there is a discrepancy between what behavioral consultants recommend in terms of interventions and support to students based on type of behavioral concern or primary educational label. If a discrepancy exists, the analysis of the data will ultimately show me that primary disability label may be considered more than individual student need when determining student services and supports. Ultimately, this will shed light on needed considerations related to determining primary versus secondary educational labels for students who are both DHH and have an ASD.

### **MODELING TEMPERATURE IN MCLEAN COUNTY MACKINAW WATERSHED IN AN AGRICULTURAL WETLAND**

Presenter:	Maxwell, Eileen
Student Class, Department:	Graduate, Geography-Geology
Mentor(s):	Prof. Eric Peterson
Author(s):	Eileen Maxwell, Eric Peterson

Temperature is known as an ecological measure that drives biological and chemical processes. Monitoring temperature provides a means to understanding groundwater's complex flow system in various field scenarios such as agricultural lands, well-fields, and wetlands. In the subsurface, the water flows from one location to another and is difficult to constrain. The presence or absence of water from surface will make a complex groundwater system even harder to determine groundwater flow. A question to consider is "does groundwater temperature change over time as a result of dry and wet conditions?" I hypothesize since temperature changes seasonally; the groundwater temperature will change. If there is a presence of water on the surface than flow pattern will change. As well as the temperature will change by the heat interactions between surface and subsurface. In McLean County, Illinois there are over 80% of agricultural lands that contributes to a non- point source of excess nutrients. While these nutrients are essential for the growing crops, the excess nutrients can lead to algal blooms and eutrophication. One way to reduce the impacts of excess nutrients on water systems are wetlands. The wetlands are a sink in the removal of nutrients through plant uptake and denitrification process before entering into the stream. For the nutrients to be removed the process is dependent on the amount of time spent in the system or its residence time. The study site will be conducted at the Durbin Farm Wetland, thirty miles east of Normal-Bloomington area in McLean County; where temperature and hydraulic data from the YSI-85 meter and water level meter will be collected. The collection will occur once every two weeks during fall and winter and twice a week for spring and summer between fall of 2013 to fall 2014. After data collection, a computer model; SEAWAT will address the question of wetland and groundwater temperature changes and water content in the wetland.

## **RELIGION AND NATIONALISM: A COMMUNAL STRUGGLE IN BRITISH INDIA**

Presenter: McCarty, Patrick  
Student Class, Department: Undergraduate, History  
Mentor(s): Prof. Sudipa Topdar  
Author(s):

In August of 1947, one nation, held for centuries by tyrannical colonial oppression, became two. Independence was finally granted to India by the British, along with the simultaneous creation of a new nation – Pakistan. Upwards of ten million people were forced by the ensuing riots to relocate. The likely cause – fundamental differences between two prevailing religions, Hinduism and Islam, and the inability to reconcile them politically. However, further study discloses that the problem lay not in the differences themselves, but in the focus on them as justification for the creation of a nation dedicated to one particular religion. This tension between Hindus and Muslims, catalyzed with the imperialist aims of the hastily departing British raj, led to the displacement of millions. In this paper, I will further examine the causality of India's Partition through analysis of important historical figures. I also discuss the relevance of religious affiliation to the formation of sovereign nations.

The characters chosen for this study are used as analytical tools to display the hybridity and plasticity of opinions within religious and political groups. Mahatma Gandhi was an advocate for religious unity and perhaps the most important voice for a united India. Mohammad Ali Jinnah, often viewed as Gandhi's adversary, is another key historical figure that I investigate in discussions that shaped the partition. These leaders, including others such as Mohammad Iqbal, Jawaharlal Nehru, and Abul Kalam Azad, are examined in this paper to demonstrate that religion did not constitute one's political ideals any more than it did their nationality. I also argue that the political opinion of individuals changed over time, yet another indicator of the irrelevance of religion in the debate of nationality. My arguments are supported by historiographical analysis of authors such as David Hardiman, Allen Hayes Merriam, and Ayesha Jalal. I will also reference the writings and speeches of Gandhi and Jinnah themselves, along with the British account of the events listed in the *Transfer of Power* documents.

This study concludes with the claim that religious differences are not grounds for forced relocation of people, nor do they justify emphasizing diversity by creating borders. In addition, this paper conclusively states that the causality of this terrible event was ultimately in the hands of the British colonizers upon their exit.

## **(IN)VOLUNTARY CHANGE: RETURNED SOJOURNER IDENTITY IN EVERYDAY LIFE**

Presenter: McNair, Ben  
Student Class, Department: Graduate, Sociology and Anthropology  
Mentor(s): Profs. Maria Schmeackle, Mike Dougherty  
Author(s):

Sojourns, or extended periods of time during which people travel and live abroad with the intention of returning to their home countries, are becoming ever more normal parts of the human experience around the globe. In the US, sojourners who travel as foreign aid workers, corporate employees, missionaries, educators, and military personnel and dependents, among others, make up an increasingly broad spectrum of the population. The experience of living



abroad is often necessarily accompanied by some sort of identity change. Sojourners may adopt a more local wardrobe, begin to appreciate local foods, learn and use local language(s), and adopt local mannerisms that ease communication and interaction with host country nationals. These changes in identity often affect how well one integrates into one's host culture (and, conversely, rejecting local customs and norms affects one's potential for isolation within the new host community) and at some level determine how livable life abroad really is.

Much existing research addresses identity change at the time of the end of the sojourn, but what happens after sojourners return home? Do these changes remain a part of sojourners' identities, or are they gradually left behind as sojourners re-acclimate to everyday life in their home cultures? If these changes in identity stay with sojourners, how long do they last? This research is grounded in identity theory, social identity theory, and theories of identity change, and is situated in the sub-field of social psychology. In this work I make use of multiple qualitative methodologies, including in-depth interviewing and auto-ethnography, to investigate the relative permanence and fluidity of identities, particularly identities changed or created while abroad. Of note, I make the distinction between who returned sojourners are and what returned sojourners do; that is, how sojourners understand themselves as individuals upon their return versus a set of potentially temporary behaviors and habits. While the experiences encapsulated between departure and return points of a sojourn are fascinating areas of study, retrospective and current looks at the weeks, months, and years after one's return to her or his home country has the potential to build a more well-rounded understanding of how (and even if) we amend, create, and maintain identities based on our social and cultural surroundings.

## **BODY COMPOSITION EDUCATION AND ASSESSMENT IN K-12 SCHOOLS**

Presenter:	Micinski, Natalie
Student Class, Department:	Graduate, Kinesiology and Recreation
Mentor(s):	Prof. David Thomas
Author(s):	Natalie Micinski, David Thomas, Jillian Barnas, Kelly Laurson, Skip Williams

Governmental and scientific organizations have indicated that K-12 schools are the primary battleground for combating the obesity and inactivity epidemics facing the U.S. The primary method of changing patterns of inactivity and poor nutrition revolve around educating students about healthy body composition, how to achieve it, and how to determine if one possess it. However, due to budget cuts, lack of administrator support, low motivation, lack of knowledge and/or inability, it was hypothesized that little body composition education and assessment takes place in K-12 school physical education.

Purpose: To determine if physical education teachers include body composition education and assessment in their instruction, what they teach, and how they teach it.

Methods: Eighty physical education teachers from a state physical education association were randomly selected to participate in the study and sent a survey to complete. Thirty-one physical education teachers (39%) completed and returned the survey.

Results: Physical educators who taught about body composition define basic terminology but not body composition concepts, assessment or interpretation of results. When asked about the importance of body composition assessment, 71% indicated that it was very important to teach. Half do not assess body composition in their programs and 13% were not allowed to perform body composition assessments due to administrative restrictions. Out of the fifteen schools

(48%) that perform body composition testing, 60% of them give results to parents. However, 74% recognize the need for additional training to complete assessments and further educate students about body composition. Conclusion: With the results indicating a low emphasis on body composition education, greater emphasis must be placed on providing teachers with the skills and knowledge and removing administrative restrictions to instruction about body composition and assessment if schools are expected to have an impact.

### **RISK MITIGATION THROUGH STOCHASTIC MODELING AND MONTE CARLO SIMULATION: ASSESSING PLAYER PERFORMANCE IN MAJOR LEAGUE BASEBALL**

Presenter: Montgomery, Justin  
Student Class, Department: Graduate, Technology  
Mentor(s): Prof. Borinara Park  
Author(s): Justin Montgomery, Borinara Park

The goal of this study is compare predictive tools and demonstrate the differences between deterministic and stochastic modeling. More importantly, the study will show how to build a better stochastic model by using historical data to rationalize the distributions and relationships between variables with the purpose of improving predictability. Because of its accessibility, the model will predict player performance in professional baseball. Professional baseball has a long history of data collection and free resources are available for every professional player. More importantly, Major League Baseball has undergone a statistical evolution since the early 2000's and provides a perfect opportunity to evaluate predictive measures. The study also provides the opportunity to display how analytics used to assess project risk can also be used to predict and assess performance risk in other professional areas. To increase model integrity, the multiple variables and risk factors associated with player performance will be analyzed and the results adopted into the stochastic model. Through the collection of historical data from Baseball-Reference.com, an accurate stochastic model will be created to project player performance. This model will account for potential variations in performance and account for injury risks and the effects of age on player performance. The model will be constructed using the historical data and the distribution of that data. The results of this model will be compared to other deterministic models to evaluate the benefits of building stochastic modeling through statistical analysis.

### **EVALUATION OF THE ANGRY BIRDS ANGER MANAGEMENT PROGRAM**

Presenter: Myers, Miranda  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Wehrmann  
Author(s): Miranda Myers

Whitted (2011) found that students just entering kindergarten are becoming increasingly more deficient in basic social skills when compared with previous groups of children entering kindergarten (p. 10). This can be especially true of those children in foster care due to the trauma and grief/loss issues that these children are experiencing. Lack of social skills, particularly anger management or emotion identification, and the inability to relate effectively with peers can lead to peer rejection (Whitted, 2011). This can translate to a number of additional difficulties for the child, i.e. depression, anxiety, not wanting to attend school or not meeting academic milestones, or acting out behavior. School performance in the early

academic years is a good predictor of later academic performance (Pears, Fisher, and Bronz, 2007).

Children in foster care are especially vulnerable due to the trauma that they have suffered from being abused and neglected and then taken away from their families. A big part of helping a foster child overcome some of the issues they may experience is to help them learn how to build relationships, which starts with basic social skills. By teaching children how to relate appropriately with others, the risk of being rejected by those around them, including peers and foster parents can be minimized and their chances of having supportive people in their life can be maximized.

The *Angry Birds Anger Management Program* is a six week program broken up into one hour sessions. It is a program that can be utilized individually or in a group setting and helps teach anger management and emotion identification. The program uses *Angry Birds*, a popular video game, to help teach these skills by looking at each of the characters and what each does in the game, i.e. Bully Bird bullies pigs that are smaller than him, and then looks at strategies that can be used to combat each bird (“emotion”). The Ohio Youth Problem, Functioning, and Satisfaction scales will be administered prior to the group as well as at the end of the group sessions to determine if there is any change in the participants’ ability to identify their emotions and use appropriate coping skills. Findings will assist the agency where the program will be offered to determine whether the program should be modified and or offered in the future to assist in social skill building.

## **EYE MOVEMENT DESENSITIZATION REPROCESSING TRAINING EVALUATION**

Presenter:	Newton, Darci
Student Class, Department:	Graduate, Social Work
Mentor(s):	Prof. Kathryn Wehrmann
Author(s):	Darci Newton

Due to high levels of trauma, anxiety and depression among those seeking social work services, a sizeable percentage of social workers’ clients will meet criteria for one of the aforementioned diagnoses. Therefore, social workers need to have accurate information on the available, effective treatments for their clients in order to discern what is in the best interest of their clients. Learning about Eye Movement Desensitization Reprocessing (EMDR), its strengths and limits, will hopefully create greater expertise in potential treatment options in order to increase clients’ overall well being. Greater competence should create healthier clients.

In short, EMDR is a therapeutic technique, comprised of specific phases and protocol, depending on the diagnoses. The technique affects the emotional, physical and cognitive areas of the brain, and is used to treat many diagnoses. It facilitates the brain’s information processing to decrease or eliminate negative, maladaptive cognitions, images and feelings. In addition, it facilitates the creation or increases positive feelings, images and healthy cognitions. However, the Substance Abuse and Mental Health Services Administration has only listed it as an evidence based therapy for post traumatic stress disorder, anxiety, depression and improved global mental functioning in adults. Given its wide use and acceptance, it is important for Master of Social Work (MSW) students who are transitioning from being students to being practitioners to

understand the applications, strengths and limits of this technique. The more knowledge they have, the better they will be able to serve their clients.

This study is an evaluation to determine the extent EMDR training will increase Master of Social Work students' knowledge of EMDR, as measured by a pre and post test. Developed by the co-principal investigator, the EMDR training focuses on EMDR concepts, techniques, effectiveness, trends, criteria for training and certification. This information is applicable to MSW students who are transitioning from being students to being practitioners, as EMDR can be used as an effective tool to treat common diagnoses that social workers will likely encounter in the field. This research project is being completed in conjunction with a 350 hour MSW practicum.

#### **DESIGN AND SYNTHESIS OF STRUCTURAL ANALOGS OF EPHEDRINE AND PSEUDOEPHEDRINE: ASYMMETRIC SYNTHESIS OF THE NEURO-PROTECTIVE AGENT ARUNDIC ACID**

Presenter: Obrero, Aaron  
Student Class, Department: Undergraduate, Chemistry  
Mentor(s): Prof. Shawn Hitchcock  
Author(s):

This research is focused on the development of chemical agent that can serve as a replacement for the use of pseudoephedrine. The cost of pseudoephedrine is nearly \$264/100 grams and it is the key ingredient in the manufacture of the illicit drug methamphetamine. The proposed research is focused on the development of a potential synthetic replacement for pseudoephedrine that would be less costly and would not possess the capacity to be converted into methamphetamine. The successful application of this compound in the synthesis of the neuro-protective agent Arundic acid would serve a demonstration of the efficacy of this material.

#### **COMPARISON OF SPECTRA OBTAINED ON A PORTABLE MASS SPECTROMETER TO AN ESTABLISHED REFERENCE LIBRARY**

Presenter: O'Leary, Adam  
Student Class, Department: Graduate, Chemistry  
Mentor(s): Prof. Christopher Mulligan  
Author(s): Adam O'Leary, Seth Hall, Herbert Oberacher, Christopher Mulligan

The variety and quality of evidence present at a typical crime scene is often quite extensive. While many novel analytical techniques have proven to be advantageous in combating the wide-ranging complexity of criminal evidence, instrument limitations in regards to sample preparation and analysis times have caused forensic laboratories to become amassed with significant backlogs of evidence. This has created the need for more rapid, streamlined technologies adapted to access the probative value of chemical evidence at the crime scene itself resulting in a significant reduction in collected evidence being sent to off-site laboratories and a subsequent reduction in backlogged evidence. Desorption electrospray ionization mass spectrometry (DESI-MS) and paper spray ionization mass spectrometry (PSI-MS) have been shown to be capable of trace level analysis of illicit chemicals in a matter of seconds with little to no sample preparation. Thus, when coupled with a mass spectrometer capable of "ambient" detection, i.e. detection of target compounds or "analytes" in their native environment and state, these techniques are

efficient methods for on-site forensic analysis from a variety of substrates and surfaces. The ruggedized and portable nature of this instrumentation not only allows for the screening of physical evidence at a crime scene, but provides law enforcement personnel with necessary information in a timely manner by means of a chemical species reference library. An automated instrument software reference library is vital as it allows for quick identification of analytes and, most importantly, provides a user friendly interface for law enforcement personnel who typically may not be experienced analytical chemists. In an effort to assess the validity of the developed chemical reference library, we compare the fragment ion mass spectra obtained for a variety of illicit and pharmaceutical drug standards to a comprehensive reference library combined with a search algorithm allowing for inter-library searching of multiple spectra per reference compound. Direct analysis of mock and authentic forensic evidence will also be evaluated to support the portable instrumentation's implementation as a legitimate on-site sensitive screening alternative for forensic evidence.

#### **REVIEW ON STATE OF THE ART IN DECISION SUPPORT MODELS TO ESTIMATE A PROJECT SUCCESS LEVEL IN MODULAR CONSTRUCTION**

Presenter: Olszewski, John  
Student Class, Department: Undergraduate, Technology  
Mentor(s): Prof. Borinara Park  
Author(s): Jonathan Olszewski, Borinara Park

The modular construction technique refers to an unconventional construction process where some or entire scope of a construction project are fabricated away from a construction site, and later transported and installed at the site. It provides various benefits such as increasing productivity, decreasing waste, to name a few. It is not surprising the modular construction is expected to increase dramatically in its adoption. Modular construction, however, brings in more complexity for planning, designing, procurement, coordination, and logistics; therefore a lot of factors decision makers should consider. Decision on modular vs conventional construction by considering all relevant factors is not a trivial task and in fact evaluating how feasible it is to modularize a construction project is a very complex multi-attribute decision making process, which demands a decision making support system for owners and designers. The goal of this study is to review and contrast various decision support models to estimate the degree of success of modular construction based on various project attributes and characteristics. The study intends to identify the weaknesses of the current models and propose what needs be considered in a future model development effort.

#### **MULTIVARIATE SEXUAL SELECTION ON MALE SONG STRUCTURE IN WILD POPULATINOS OF SAGEBRUSH CRICKETS, CYPHODERRIS STREPITANS (ORTHOPTERA: HAGLIDAE)**

Presenter: Ower, Geoffrey  
Student Class, Department: Graduate, Biological Sciences  
Mentor(s): Prof. Scott Sakaluk  
Author(s):

While many studies have measured multivariate selection on sexual signals, few have done so in wild populations. Sagebrush crickets are well suited for such investigations because non-virgin males are unambiguously marked with hindwing wounds inflicted by female nuptial feeding. We measured the shape and strength of sexual selection acting on male song by recording the songs

of virgin and non-virgin males captured from three wild populations. To determine how male song is influenced by female song preference, we conducted a companion study in which synthesized male songs were broadcast to females in choice trials. Multivariate selection analysis revealed a saddle-shaped fitness surface with the highest peak corresponding to longer train and pulse durations, and longer intertrain intervals. Longer trains and pulses likely enhance mate attraction, but selection for longer intertrain intervals suggests that the energetic costs of singing may necessitate recovery time outs. Playback trials confirmed female preference for longer train and pulse durations, and additionally revealed significant stabilizing selection on dominant frequency, suggesting that the female auditory system may be tightly tuned to the species-specific call frequency. Overall our results showed a complex pattern of multivariate nonlinear selection characterized primarily by strong stabilizing and disruptive selection on male song characteristics.

### **EXTENDED STABILITY OF ANISOTROPIC GOLD NANOPARTICLES BY POLY(N-ISOPROPYLACRYLAMIDE) NANOPARTICLES**

Presenter: Pakawanit, Phakkhananan  
Student Class, Department: Graduate, Chemistry  
Mentor(s): Prof. Jun-Hyun Kim  
Author(s):

A simple synthetic method is proposed to stabilize anisotropic gold nanoparticles possessing a strong and broad absorption band in the presence of cross-linked poly (N-isopropylacrylamide) nanoparticles. The structural properties and the stability of the composite materials were thoroughly characterized by UV-visible spectrophotometer, scanning and transmission electron microscopes, and dynamic light scattering, infrared spectrometer, and Raman spectroscopy. The extended stability of these anisotropic nanoparticles was presumably achieved by van der Waals interactive forces between the gold and polymer nanoparticles. Due to the strong absorption property and high surface-to-volume ratio, these nanocomposites showed fast reversible structural volume changes upon exposure to broad band light. As such, these composites may serve as an excellent template for the development of photothermally triggered delivery systems.

### **OMRON PEDOMETER STEP COUNT ACCURACY AND RELIABILITY BASED ON WEAR LOCATION**

Presenter: Panfil, Taylor  
Student Class, Department: Graduate, Kinesiology and Recreation  
Mentor(s): Prof. Kelly Laurson  
Author(s): Taylor Panfil, Joey Lee, Kelly Laurson

Traditionally pedometers are designed to be worn at the hip, but some recent models (such as the Omron HJ-720T) were developed to be worn at the hip or in the pocket.

**PURPOSE:** To validate the step count accuracy and reliability of the Omron HJ-720T pedometer by wear location during treadmill walking, jogging and running.

**METHODS:** Thirty-four (19 males) college-aged adults participated in the study. Subjects wore four Omron HJ-720T pedometers (left hip [LH], left pocket [LP], right hip [RH] and right pocket [RP]) during four three-minute stages of treadmill walking, jogging and running. The two walking stage speeds were 80 and 107  $\text{m}\cdot\text{min}^{-1}$ . Speeds were self-selected for the jogging and running

conditions. A researcher manually counted steps (MC) with a hand counter providing a criterion measure. A 4x5 repeated measures ANOVA and intraclass correlations were used to evaluate the accuracy and reliability of the monitor by location.

RESULTS: The ANOVA revealed no statistical differences from the MC by wear locations during the walking stages, but differences existed for both pocket wear locations during jogging and running. The LH/RH wear locations counted 99.9-100.0%, 100.2-100.3%, 98.7-98.9% and 96.8-97.1% of MC steps at 80 m•min<sup>-1</sup>, 107 m•min<sup>-1</sup>, jogging and running, respectively.

Step counts were less accurate when worn in the pockets, and accuracy declined as speed increased, with the LP/RP counting 100.5-100.9%, 96.4-98.2%, 89.4-90.7% and 82.5-85.0% of MC steps at speeds of 80 m•min<sup>-1</sup>, 107 m•min<sup>-1</sup>, jogging and running, respectively. The intraclass correlation between the LH and RH wear locations indicated the strength of the association weakened as speed increased,  $r = 0.989, 0.916, 0.741$  and  $0.541$  (all  $p < 0.05$ ) at 80 m•min<sup>-1</sup>, 107 m•min<sup>-1</sup>, jogging and running, respectively.

CONCLUSIONS: The hip wear locations provided valid step counts when compared to MC, reporting step counts within  $\pm 3.2\%$  of MC steps at all speeds. Although the pocket wear locations were not significantly different from the criterion during walking, the traditional hip wear locations provided more consistent measures and were more accurate at higher speeds. The hip is the preferred wear location.

#### **KEY STRAINS, ANGER AND DELINQUENCY: THE GENERAL STRAIN THEORY TEST ON SOUTH KOREAN YOUTHS FROM LOW-INCOME HOUSEHOLDS**

Presenter: Park, JiHye  
Student Class, Department: Graduate, Criminal Justice Sciences  
Mentor(s): Prof. Dae-Hoon Kwak  
Author(s):

For a couple decades, researchers have attempted to test General Strain Theory (GST) and delinquency. Most prior research on GST suggests that strained individuals are more likely to engage in crimes and individuals who exposed to strains are more likely to experience negative emotions particularly, anger which finally in turn, result in deviance. Although the strains and its association with delinquent behaviors are well established, majority studies did not include key strains and failed to focus on marginalized youths as mostly examining traditional school age youths. In addition, most prior inquiries on GST have been limited to Western societies with the exceptions of a few studies. Therefore, the current study examines the applicability of GST in explaining delinquent behaviors and impacts of anger among South Korean youths from low-income households (N=239) with 5 key strains (i.e., family conflicts, parental punishments, teacher's punishments, financial strains and exam-related strains). The current data is Korea Youth Panel Study (KYPS) of 2005, which was obtained by National Youth Policy Institute (NYPI) in South Korea. The result of the current research indicates that teacher's punishment is significant among the sample population. Finally, the implications of the findings and future directions with respect to GST will be discussed.

## **THE IMPACT OF GENDER INEQUALITY AND POVERTY ON TRAFFICKING IN WOMEN**

Presenter: Park, JiHye  
Student Class, Department: Graduate, Criminal Justice Sciences  
Mentor(s): Profs. Cara Rabe-Hemp, Dae-Hoon Kwak  
Author(s):

Human trafficking (HT) has long been considered a gendered crime of sexual exploitation (Rao & Presenti, 2012). Previous reports of HT suggest that gender inequality and poverty can cause discrimination and marginalization, providing traffickers the opportunity to exploit the vulnerable status of victims (United Nations Office on Drugs and Crime, 2012). Surprisingly, the majority studies on HT have failed to examine this relationship to the origins of trafficking in women. In order to fill this gap in the research, the current study will examine how gender inequality and poverty in a country impacts the country's trafficking in women. To this end, several international data sets will be utilized, including: Trafficking in Persons- Global Patterns (UNOCD, 2006), World Bank and United Nations Development Programmes (UNDP). The implications of this study will inform the academic research, as well as, international agencies dedicated to stopping the trafficking of women.

## **PHYSICAL ACTIVITY MOTIVES AMONG CAMPUS RECREATION PARTICIPANTS**

Presenter: Patton, Zachary  
Student Class, Department: Graduate, Kinesiology and Recreation  
Mentor(s): Prof. Dan Elkins  
Author(s): Zachary Patton, Dan Elkins, Brent Beggs

The influence of motivation on participation of campus recreation participants is critically important for campus recreation professionals to understand when designing and implementing their programs. There have been studies conducted by researchers to better understand what motivates individuals to participate in physical activities associated with campus recreation (Beggs, Elkins, & Powers, 2005; Bourgeois, Leunes, Burkett, Dragges-Bourgeois, Friend, & Meyers, 1995; Cooper, Schuett, & Phillips, 2012; Kanters & Forester, 1997). These studies are largely based on examining the varying foci of intrinsic and extrinsic motivational factors of program participants. Self-Determination Theory (Deci & Ryan, 1985) is often tested as a theoretical framework when examining intrinsic and extrinsic motivation. While research on motivation and participation in campus recreation programs has been conducted, further research examining the motivational relationships across demographic groups and programs is necessary. The purpose of this study is to analyze the motivational factors of campus recreation participants and investigate differences in demographic and program participation (fitness, intramural sports, club sports, informal sports, and outdoor adventure). Motivational factors for this study will be measured using the Motives for Physical Activity Measure-Revised (MPAM-R) scale developed by Ryan, Frederick, Lipes, Rubio, and Sheldon (1997). Participants will be recruited from a student email address list obtained by the Office of Campus Recreation. Approximately 8000 unique users of the campus recreation facility will be emailed an invitation to complete an on-line questionnaire which will include demographic questions, questions related to participation in campus recreational sports, and the MPAM-R. The results will provide campus recreational professionals with a better understanding of how to facilitate participation



in their programs.

### **THE MIDDLE SCHOOL TRANSITION FOR LATINO EMERGENT BILINGUAL STUDENTS**

Presenter: Pecho, Kerry  
Student Class, Department: Graduate, Psychology  
Mentor(s): Prof. Adena Meyers  
Author(s): Kerry Pecho, Adena B. Meyers, Jennifer F. Mays, Daisy Bueno, Karina Diaz

The middle school transition is often regarded as one of the most challenging periods of a student's educational experience (Akos, 2002). Zeedyk, Gallacher, Henderson, Hope, Husband, and Lindsay (2003) found that skills expected by teachers that contribute to a successful transition (e.g., adaptability, confidence) were different from those identified by elementary students (e.g., academic skills). Zeedyk et al. (2003) stress the importance of bridging the discrepancy in perceptions among students, teachers, and parents of the school transition so that students feel supported and capable of managing the transition. Although many students find the middle school transition difficult, Latino students may perceive it as especially challenging (Akos & Galassi, 2004). In addition to typical issues that arise during the middle school years, many Latino students often deal with linguistic and cultural issues as well. For example, they may experience stressors due to immigration, acculturation, and language barriers. Since the Latino population is the fastest growing minority group in the United States (Humes, Jones, & Ramirez, 2011), it is important that schools identify the factors that contribute to the resilience of these students and effectively support them through their transition to middle school. This poster will describe a qualitative research project designed to facilitate an understanding of Latino emergent bilingual students' anticipations of and experiences with the middle school transition, including their concerns and systems of support.

### **EFFECT OF ALPHA-GALACTOSIDASE AND CITRIC ACID ON NURSERY PIG GROWTH PERFORMANCE**

Presenter: Pegg, Elizabeth  
Student Class, Department: Graduate, Agriculture  
Mentor(s): Prof. Peter Lammers  
Author(s): Elizabeth Pegg, Peter Lammers

Soybean meal contains nonstarch polysaccharides which lower the feed's digestibility and can limit inclusion of soybean meal in nursery pig diets. Addition of exogenous enzymes, such as  $\alpha$ -galactosidase, may increase nutrient digestibility of corn-soybean meal diets by hydrolyzing bonds between nonstarch polysaccharides that are not usually severed by endogenous enzymes. Addition of an acidifier, such as citric acid, may decrease diet pH thereby increasing  $\alpha$ -galactosidase activity. In addition, citric acid may have direct effects on improving growth performance. The purpose of this study was to examine the effect of supplementing nursery diets with  $\alpha$ -galactosidase, citric acid, or both. Weaned pigs ( $29 \pm 2$  d,  $8.5 \pm 1.7$  kg) were sorted into 20 pens (1.75 x 1.19 m, 6 pigs/pen) in an environmentally controlled nursery at the Illinois State University Farm, Lexington, IL. Pens were balanced for weight ( $51.5 \pm 0.3$  kg) and gender (3 barrows, 3 gilts). Corn-soybean meal diets, formulated to meet or exceed NRC requirements,

were fed in-phase for 21 days. Alpha-galactosidase (AlphaGalTM 145 Pc, Kerry Inc) was added to selected diets at a rate of 0.3 g/kg soybean meal (SBM). Dietary treatments were Control (corn-soybean meal), Enzyme (Control + at least 75 ppm  $\alpha$ -galactosidase), Citric (control + 5% citric acid), and Dual (Control + at least 75 ppm  $\alpha$ -galactosidase + 5% citric acid). Feed disappearance and pig BW were measured weekly to calculate pen ADFI, ADG, and G:F. Analysis of variance was performed using SAS (SAS Institute Inc., Cary, NC). Means were compared using Tukey's HSD. Pen was the experimental unit, but results are presented on an individual pig basis. Pigs fed Citric or Dual diets were more efficient ( $P < 0.05$ ) than pigs fed Enzyme. However, pigs fed Enzyme had significantly higher ( $P < 0.05$ ) ADFI than pigs fed Citric and Dual diets (767.2 vs. 616.7 and 610.4 g/d), as well as, significantly higher ( $P < 0.05$ ) ADG than pigs fed Control and Citric diets (520.0 vs. 457.6 and 453.7 g/d). Pigs fed enzyme gained weight faster than pigs fed Control or Citric diets, but were less efficient than pigs fed Citric or Dual diets. Improving ADG in nursery pigs is generally more beneficial than improving G:F. For improved weight gain, and feed

intake,  $\alpha$ -galactosidase supplementation of nursery diets should be considered. Inclusion of 5% citric acid does not improve efficacy of  $\alpha$ -galactosidase in the aforementioned diets.

### **FACTORS INFLUENCING RESIDENCY DECISIONS AMONG OLDER ADULTS**

Presenter: Pemberton, Jennifer  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Sheridan  
Author(s):

Older adulthood is the fastest growing age group in America with its population projected to increase to over 81 million by the year 2040 compared to the 35 million in the year 2000. Professionals have begun scrambling to prepare for this 231 percent increase by building long-term care facilities and developing new services, but few studies exist that reveal what these aging Americans actually want and need. To identify what factors influence residency decisions among older Americans, a quantitative, descriptive, process program evaluation will be utilized with a sample population from Westminster Village. Westminster Village is a continuing care community encompassing private condos, independent living, assisted living, and skilled nursing care. Residents will answer survey questions, specifically identifying what factors influenced their decisions to move into the facility. The collected data will enable administrators of Westminster Village to provide more comprehensive services to current residents while also better targeting and assisting potential future residents.

### **HOW ELVIS PRESLEY AND BROWN VS. BOARD OF EDUCATION CHANGED AMERICA**

Presenter: Pokrzywinski, Chelsea  
Student Class, Department: Undergraduate, History  
Mentor(s): Prof. Richard Hughes  
Author(s):

In 1954, shortly after the famous *Brown vs. Board of Education* decision, Elvis Presley would push to integrate the radio dial with his single, *That's Alright Mama*. This paper while focusing on Presley's early years in Memphis also looks at how his cover of *That's Alright Mama* changed American music.

Presley's cover of the song, originally recorded by Arthur Cruddup, would start the breakdown of racial barriers in radio. To remain relevant to a changing listening audience the radio stations across America would have to be able to diversify and play more than one type of music. These stations would also have to be willing to play race records-recordings by African American artists- alongside the the recordings of white artists. Presley and rock n roll would do for the radio dial what *Brown vs Board of Education* would do for the American public school system- force the discussion of race and changing racial attitudes to the forefront of American life.

## **CORRELATION OF SHOULDER AND ELBOW KINETICS WITH BALL VELOCITY IN COLLEGIATE BASEBALL PLAYERS**

Presenter:	Post, Eric
Student Class, Department:	Graduate, Kinesiology and Recreation
Mentor(s):	Prof. Kevin Laudner
Author(s):	Eric Post, Kevin Laudner, Todd McLoda, Regan Wong, Keith Meister

Context: Throwing a baseball is an extremely dynamic and violent act that places large amounts of stress on the elbow and shoulder. Due to the repetitive nature of baseball pitching, the accumulation of these forces can often lead to injury. Specific injuries at the elbow and glenohumeral joints have been linked to several kinetic variables that occur throughout the throwing motion. However, very little research has been conducted to directly examine the relationship between these kinetic variables and ball velocity.

Objective: To examine the correlation of peak ball velocity with elbow valgus torque, shoulder external rotation torque, and shoulder distraction force in a group of collegiate baseball pitchers.

Design: Cross-sectional.

Setting: Motion analysis laboratory.

Participants: Sixty-seven, asymptomatic, NCAA Division I baseball pitchers (age=19.5±1.2 years; height=186.2±5.7 cm; mass=86.7±7.0 kg, 48 right-handed, 19 left-handed) participated.

Interventions: We measured peak ball velocity using a radar gun. We measured elbow valgus torque, shoulder external rotation torque and shoulder distraction force of the throwing arm using a three-dimension, high-speed video capture system. A Pearson's correlation coefficient was generated to determine the relationship between ball velocity and peak elbow valgus torque, shoulder distraction force, and shoulder external rotation torque ( $p < .05$ ).  
Main Outcome Measures: Dependent variables included elbow valgus torque, shoulder external rotation torque, and shoulder distraction force.

Results: Mean and standard deviation values for the group included ball velocity of  $37.3 \pm 1.6$  m/s, elbow valgus torque of  $5.7 \pm 1.3$  (% body weight\*height), shoulder distraction force of  $110.0 \pm 16.0$  (% body weight), and shoulder external rotation torque of  $5.2 \pm 1.0$  % body weight\*height). A weak positive correlation was found between ball velocity and shoulder

distraction force ( $r = .26$ ,  $p = .02$ ). However, there were no significant correlations between ball velocity and elbow valgus torque ( $r = .20$ ,  $p = .05$ ) or ball velocity and shoulder external rotation torque ( $r = .10$ ,  $p = .22$ ).

Conclusions: The results of this study indicate that there is very little association between peak ball velocity and several kinetic variables at the elbow and shoulder joints in college baseball pitchers. While a weak positive correlation was found between shoulder distraction force and ball velocity, no significant association was seen between ball velocity and elbow valgus torque or shoulder external rotation torque. These results indicate that other factors, such as improper pitching mechanics, may contribute more to increases in joint kinetics than peak ball velocity.

## **LOCATING THE DEVELOPMENTAL EXPRESSION OF PTH TYPE-2 RECEPTOR B**

Presenter:	Powers, Joseph
Student Class, Department:	Undergraduate, Biological Sciences
Mentor(s):	Prof. David Rubin
Author(s):	Nick Seitz, Scott Halkyard, Byron Heidenreich, David Rubin

Parathyroid hormone (PTH) is an endocrine hormone secreted by the parathyroid gland. Although PTH regulates serum calcium levels, the related PTH2 neurohormone regulates brain, otic, and cardiac development. The PTH2 neurohormone activates the PTH type-2 Receptor (PTH2R). Current studies suggest that the PTH2-PTH2R system is necessary for nociception, hearing, and cardiac function. There is much to discover about the PTH2-PTH2R system including its expression location. When the genes encoding the PTH2-PTH2R system are deleted by molecular techniques (knockouts), the animals (mice or zebrafish) are not viable. Recently, knockouts of the genes for the PTH1-PTH1R system showed that these knockouts had similarities to humans expressing campomelic dysplasia and craniofacial deformities. If a knockout is performed on the genes in the PTH2-PTH2R system, then the exact neural-hormonal function of this system could be better defined.

However, before we can begin to perform gene knockouts to understand the PTH2-PTH2R function, we need to understand where the genes are expressed. Since PTH2 is believed to have neurological as well as hormonal function, it is reasonable to infer that the location of expression is within the brain. I will be using the zebrafish as a model to discover which tissues express the PTH2R gene (IACUC 15-2011 and Biosafety 04B-2011 protocols). The trajectory of these findings could affect fields in endocrinology, developmental biology, and potentially obstetrics/fertility studies. Vertebrates (zebrafish and humans, for example) have highly conserved endocrine systems and the genes, which regulate these systems, are syntenically and developmentally conserved. To test this property, we investigated conserved synteny using the Synteny Database (Catchen et al. 2009). Results showed that zebrafish *pth2r* has neighbors that have human orthologs residing near PTH2R on human chromosome 2. We conclude that *pth2r* has conserved synteny with the human genome, consistent with orthology (Bhattacharya, 2011). Thus, my findings in the zebrafish will be applicable to humans. To accomplish this, euthanized zebrafish embryos (2 weeks post fertilization) will be embedded with a cryopreservation solution and the frozen sagittal sections will be obtained. Zebrafish frozen serial sections will be prepared (in the laboratory of Dr. Byron Heidenreich) and hybridized to a Digoxigenin-labeled PTH2R complimentary RNA (cRNA) probe (Roche). I will follow previously

used hybridization protocols from Dr. Rubin's lab, wash the probe stringently to increase the signal compared to background and photos of the slides will be taken. These results will be analyzed to determine the PTH2R tissues-specific expression.

### **PHONOLOGICAL AWARENESS AND LANGUAGE KNOWLEDGE OF FUTURE EDUCATORS AND SPEECH-LANGUAGE PATHOLOGISTS**

Presenter: Powers, Michaela  
Student Class, Department: Undergraduate, Communication Sciences and Disorders  
Mentor(s): Prof. Heidi Harbers  
Author(s):

The purpose of this study is to assess phonological awareness in future educators and future speech-language pathologists. I chose these two groups because phonological awareness, the sound structure of spoken words, has been identified as a crucial area of early literacy instruction (Moran & Fitch, 2001). While a teacher is responsible for instructing children to read and write, a speech-language pathologist is responsible for preventing written language problems, identifying children at risk, assessing reading and writing, providing intervention for reading and writing, and assisting the teacher (American Speech-Language-Hearing Association, 2001). Evidence suggests that many educators may not have sufficient phonological awareness, a skill needed to provide effective instruction to students. Louisa Moats and Barbara Foorman agree that phonological awareness instruction requires the teacher to differentiate syllables from onsets and rimes and to count, produce, blend, segment, and manipulate the individual speech sounds in words, which are included in my survey. In an experiment, researchers found that even a two-week program could significantly improve a teacher's understanding of phonology and early reading (Moats & Foorman, 2002).

This study will determine if seniors in the elementary education program and communication sciences and disorders program are competent in this area. Seniors in the communication sciences and disorders major may have an advantage because they have all taken a four credit hour course in phonetics. In order to answer this question a survey will be given to two classes, TCH 264, Language Arts Instruction Strategies and CSD 332, Clinical Processes. There are 22 students enrolled in the TCH 264 course and 30 in the CSD 332 course. I chose these courses because the students in TCH 264 have taken two classes in literacy development in elementary school and the students in CSD 332 have taken a course in phonetics. The survey consists of categories of phonemic counting, phonemic matching, counting syllables and morphemes, recognizing speech sounds, recognizing the base word from the derived form, and identifying word categories such as noun, verb, adjective, or adverb. I hope to answer if future educators and speech-language pathologists have a sufficient understanding of phonology in order to instill literacy skills in young children.

### **METAL CLUSTERS CONTAINING OXAZOLINE AND OXAZINE RINGS**

Presenter: Ren, Yixin  
Student Class, Department: Graduate, Chemistry  
Mentor(s): Prof. Lisa Szczepura  
Author(s): Yixin Ren, Andrea Bruck, Joan Tirado, Lisa Szczepura

Two new hexarhenium clusters,  $[\text{Re}_6\text{Se}_8(\text{PEt}_3)_5(\text{NC}(\text{CH}_3)\text{O}(\text{CH}_2)_2)]^{2+}$  and  $\text{Re}_6\text{Se}_8(\text{PEt}_3)_5(\text{NC}(\text{CH}_3)\text{O}(\text{CH}_2)_3)]^{2+}$ , containing oxazoline and oxazine ligands were isolated in

high yield and purity. Initial isolation of these cluster complexes resulted in impure materials due to reaction with halide counter ions. However, metathesis with the tetraphenylborate ion enabled us to improve the purity and yield of these products. These compounds were characterized by <sup>1</sup>H and <sup>31</sup>P NMR spectroscopy, ESI-MS, and elemental analysis. This presentation will cover the synthesis and characterization of these two compounds along with preliminary studies involving the potential catalytic reactivity of these rhenium clusters.

### **THE EFFECTS OF RELAXATION YOGA ON PERCEIVED LEVELS OF STRESS IN GRADUATE STUDENTS**

Presenter: Rice, Jess  
Student Class, Department: Undergraduate, Communication Sciences and Disorders  
Mentor(s): Profs. Ann Beck, Heidi Verticchio  
Author(s):

During the fall semester of 2013, Dr. Ann Beck studied the effects of relaxation yoga on the perceived levels of stress of graduate students in the Communication Sciences and Disorders department at Illinois State University. Dr. Beck led two separate groups of graduate students through six sessions of relaxation yoga once per week. During the one-hour yoga sessions, students were taught breathing, meditation, and stretching techniques in a quiet room. The class sequence of exercises was the same for both groups. The identity of each participant was kept confidential, and there were two people assisting with treatment fidelity during each of the twelve sessions to ensure that the same sequence was used in each class for both groups. The participants filled out surveys before and after the yoga sessions to describe their levels of perceived stress.

### **EMPLOYMENT OPPORTUNITIES FOR DISADVANTAGED YOUTH AT SEATTLE YOUTH GARDEN WORKS**

Presenter: Rodgers, Ashley  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Wehrmann  
Author(s):

There are an estimated 3 million homeless youths and young adults in the United States (M. Ferguson, 2010, 490). Homeless youth often report family violence, poverty, instability and trauma during childhood and adolescence (Arabonow, 2013). There are many factors that need to be addressed when trying to help at-risk youth find employment. At-risk is defined here as youth who are absent from their home for more than 72 hours without their parents consent, abusing alcohol or drugs, and is beyond the control of his or her parent such as the child endangers the health, safety, or welfare of the child or any other person. Unemployment rates among homeless youth have risen as high as 66% to 71% (Ferguson, 2012). Without access to employment during the transition of adulthood, homeless youth lack the income and resources to survive, which can lead to social and labor exclusion. The longer people remain on the streets, the greater their entrenchment in homeless culture and disaffiliation from traditional/prosocial institutions and the likelihood they will be drawn into street culture where substance use and other criminal behaviors can become normalized (Ferguson, 2012, 387).

**TRUST BASED RELATIONAL INTERVENTION FOR CHILDREN FROM HARD PLACES:  
EFFECTIVENESS IN REDUCING PARENTAL STRESS FOR PARENTS PARTICIPATING IN THE BABY  
FOLD**

Presenter: Rose, Marcellus  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Sheridan  
Author(s):

The number of children in the United States and worldwide that experience trauma can vary depending on the source. However, the effects of trauma-exposed children include psychological, physical, behavioral, developmental, or emotional deficits. Often times these children experience trauma via the parents, caregivers, or adults who are responsible for them. Children may then be exposed to additional trauma if they are removed from their parents care. The task of addressing issues that trauma-exposed children may present can be overwhelming for adoptive and foster families. Parents, adoptive or foster, find their ability to parent challenged and are often stressed. This program evaluation study aims to determine if Trust Based Relational Intervention (TBRI), an intervention developed by Texas Christian University, is effective at reducing parental stress of parents/caregivers of children with traumatic or adverse histories participating in The Baby Fold's Adoption Preservation Program. Findings from this research will explore the effectiveness of TBRI at reducing the level of parental stress for adoptive parents.

**IN FIELD MEASUREMENTS OF NITROGEN MINERALIZATION FOLLOWING THE TERMINATION OF  
COVER CROPS**

Presenter: Ruffatti, Michael  
Student Class, Department: Undergraduate, Agriculture  
Mentor(s): Prof. Shalamar Armstrong  
Author(s):

The ability of cover crops to scavenge nitrogen from the soil during winter months has been thoroughly investigated, however little is known about the mineralization rate of cover residue or the rate of scavenged N release back to the soil solution via nitrification. Therefore, the objective of this study is to determine the impact of cover crop species on the release of fall N to the spring cash crop following chemical termination. The experimental site was located at the Illinois State University Research and Teaching farm in Lexington, IL. All treatments received fall nitrogen at a rate of 200 kg ha<sup>-1</sup> into standing cereal rye, tillage radish, crimson clover and control (no cover crop). Cover crops were sampled and analyzed for total nitrogen to calculate N-uptake. After chemical termination soil samples were collected weekly and were analyzed for nitrate to determine the rate of nitrification. Cereal rye and crimson clover did not have a significant impact on rate of soil nitrification. In spring 2012, tillage radish had a rate of nitrification two times greater than the control. In 2013 radish rate of nitrification was not significantly greater than the control. It is likely that rate of nitrification is strongly driven by spring weather. Spring 2012 was considerably warmer and had less precipitation than 2013; warm/dry weather likely contributed to greater mineralization of radish biomass and soil nitrification. None of the cover crop treatments negatively impacted spring nitrification; radish

increased nitrification and soil nitrate immediately before corn planting. On average radish releases more fall applied N relative to cereal rye or crimson clover. The inclusion of cover crops into conventional cropping systems has the potential to improve the efficiency of fall applied N.

## **THE EFFECT OF PERSUASIVE TEXT, NEED FOR COGNITION, AND SELF MONITORING ON BEHAVIORAL INTENTIONS**

Presenter: Salley, Tyler  
Student Class, Department: Undergraduate, Psychology  
Mentor(s): Profs. Corinne Zimmerman, Kimberly Schneider  
Author(s):

The purpose of this research project is to examine if argument strength in a persuasive narrative is enough to elicit change in behavioral intentions. The strength of the arguments will be experimentally manipulated. Strength will be manipulated by the presence of 8 arguments for community service, 8 arguments against community service, as well as a control group consisting of 8 factual, non argumentative statements. The behavioral intentions of the participants will be assessed by answering multiple choice questions (i.e., “how much community service do you intend on doing this semester/next semester”). Persuadability will also be measured by multiple-choice questions (i.e., “do you feel as though you do enough community service”). A second goal of this research is to determine whether personal characteristics (i.e., need for cognition and self monitoring level) contribute to perceived amount of persuasion and behavioral intention. Self-monitoring is the extent of being aware of one’s actions in comparison to social desirability. High self-monitors are more likely to observe and control their presentation and expressive behavior, as opposed to people that are low self-monitors. Low self-monitors have a high attitude-behavior correspondence, with little consideration of social acceptability. Snyder (1974) suggested that low self-monitors are more likely to act in accordance with their attitudes, making it easier to predict their behavior. Additional research suggests that an individual’s score on the need for cognition scale is an important factor in predicting persuadability (Haugtvedt & Petty, 1992). This scale determines differences in intrinsic motivation to participate in effortful cognitive tasks. Haugtvedt and Petty (1992) suggest that this scale positively correlates with the individual likelihood of thinking and cognitively analyzing a persuasive argument. Individuals with “high” need for cognition are motivated to think about communication, whereas individuals “low” in need for cognition are not (Cacioppo & Petty, 1982). My hypotheses are: (a) the presence of an argument will elicit a significant change in behavioral intentions relative to the control group, and that the deviation from the control group will be more profound in the positive argument manipulation in contrast to the negative; (b) the participants’ need for cognition score will be a more accurate predictor of persuadability and the participants’ self monitoring level will be a more accurate predictor for behavioral intentions; (c) each subject variable (i.e., self monitoring, need for cognition) will be more accurate in prediction independently rather than combined.



## **ACHIEVEMENT MOTIVATION: INCREMENTAL VALIDITY IN CONCURRENT AND PREDICTIVE DESIGNS**

Presenter: Salmonson, Andrew  
Student Class, Department: Graduate, Psychology  
Mentor(s): Profs. Dan Ispas, Alexandra Ilie  
Author(s): Andrew Salmonson, Dan Ispas, Alexandra Ilie, Dragos Iliescu,  
Achievement motivation is an individual difference defined as the extent to which an individual desires and works toward completing difficult goals in both professional and personal domains. The current study examined if achievement motivation is predictive of job performance. Data was collected from two samples: current employees and job applicants from the same multinational company. Achievement motivation predicted job performance directly (showed criterion validity) and improved the prediction of job performance when used in conjunction with a cognitive ability test (incremental validity) in both groups

## **STUDENT PERCEPTIONS OF PERFORMANCE ENHANCING DRUGS AND SUBSTANCES**

Presenter: Sandine, Kyle  
Student Class, Department: Graduate, Kinesiology and Recreation  
Mentor(s): Prof. Brent Beggs  
Author(s): Kyle Sandine, Brent Beggs

Our society has become highly competitive in nature, especially when it comes to sports and those trying to find an edge to make it to the next level. Such edges include supplement and performance enhancing drug use in starting on average, as young as 15 years old (Yesalis, 1993). The pursuit of muscularity is no longer something relegated to a fringes bodybuilding subculture, but is now an aspect of everyday life for adolescent boys (Martin, 2011). Studies have shown that not only do steroids have direct effects on the body, but can also lead to other illicit drugs, smoking cigarettes, and alcohol abuse (Corbin, 1994). There is a misconception among young adults that can potentially cause devastating damages to those who are ignorant to steroid effects, and an extension, supplement effects as well. That being said, there is reason to believe with the emergence of more legal supplements, the results individuals see or desire, or lack thereof, can lead to experimenting with supplements, steroids, and other drugs. There is a large percentage of the adolescent population receiving unreliable information and this puts them in harms way. This study looks to identify perceptions among non athlete college students to narrow who holds certain beliefs about supplements and steroids. Recommendations can be made from this study to target specific markets in order to identify and further educational efforts. 7,000 campus recreation participants will be contacted via email for this study to complete an original survey regarding perceptions of performance enhancing drugs and supplements in recreation settings. Analysis of variance and t-test procedures will be conducted to examine differences in perception based on frequency of facility usage, knowledge of steroids and supplements, gender and year in school.

## **DETERMINING THE RELIABILITY AND VALIDITY OF ASSESSMENT RESULTS WHEN USING PLAY-BASED OBSERVATION OF YOUNG CHILDREN**

Presenter: Schiff, Lyndi  
Student Class, Department: Undergraduate, Special Education  
Mentor(s): Prof. Sharon Doubet  
Author(s):

Play-based assessment is only one of the many assessments used in early childhood and early childhood special education. Results of this type of assessment provide information used to determine programs and adaptations for a child age birth to five. Is watching a child at play a viable assessment? Observation of a child at play is an authentic assessment, but do the results provide professionals with reliable and valid data that can be used to make high stakes decisions?

There are many questions that must be answered when determining if play-based assessment is the best assessment option for a child. The first question is what exactly is play-based assessment and how is it performed? Also, which professionals on an assessment team use play-based assessment? Which abilities can be assessed? Where is this assessment being used and are some professionals able to utilize the assessment approach better than others? Is there a particular age group that will benefit more from this type of assessment? How authentic is this assessment especially in relation to other assessments in the field? How valid and reliable is this assessment? Finally, what are the greatest strengths and weakness of this type of assessment and where is the potential for this type of assessment to grow to be even more successful?

All of these questions will be addressed in depth through this research and be presented in a way that will be beneficial to future teachers in the early childhood education and special education fields. Play-based assessment poses various questions and by researching the answers, professionals can determine if this assessment will be beneficial to them for assessing children ages birth to five.

## **SYNTHEISIS AND THE ONE ELECTRON REDUCTION OF 9-ANTHRYL ISOCYANATE**

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

Isocyanates are versatile compounds that are widely used as building blocks for more complex molecular systems, and are common intermediates in many pharmaceutical, agricultural and polymeric products. In spite of the extensive research already performed using isocyanates, there is little known about the one electron reduction of these systems. One electron reduction experiments with aromatic substituted isocyanates have revealed that the anion radicals undergo a variety of reactions that appear to be dependent upon ion pairing with the alkali metal used. Notably, when a K metal reduction of phenyl isocyanate or 1-naphthyl isocyanate is

carried out in hexamethylphosphoramide (HMPA), a solvent where ion pairing is absent, we have found, through electron paramagnetic resonance (EPR) studies, that the anion radical of biphenyl and perylene, respectively, are formed. Similarly, when the reduction of either compound is carried out in tetrahydrofuran (THF) with 18-crown-6 ether present, identical results are obtained. We are extending these studies to include other fused aromatic systems. Notably, the synthesis of 9-anthryl isocyanate and the one electron reduction of this compound will be discussed.

### **EFFECTIVENESS OF STAFF COMMUNICATION AT A RESIDENTIAL SERVICES CENTER**

Presenter: Schrimpl, Carly  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Sheridan  
Author(s):

Communication is critical to any functional organization and can be an ongoing problem within a working environment involving collaborative departments. The purpose of this exploratory study is to examine the perspective of communication between two departments that provide treatment to residential clients. Utilizing a survey, the study explores individual styles of communication, barriers to communication, and perceptions of effective communication. The goal of this study is to provide each of the departments with insight into how well they are communicating as a team and how well they are collaborating with other departments. Findings will be utilized to inform agency administrators and staff of the communication perspectives from both departments and aid in decision-making regarding changes to the agency's communication model.

### **COMPARISON OF TEE & RPE VALUES IN FASTED AND NON-FASTED STATES**

Presenter: Schulz, Britany  
Student Class, Department: Graduate, Kinesiology and Recreation  
Mentor(s): Prof. Noelle Selkow  
Author(s): Kristen Lagally, Jenna Bossle

A commonality among a large percentage of the population is embarking on weight loss programs that focus on energy consumed vs. energy expended. In order to decrease one's current weight, they must expend more calories in a day than they consume. A good way to increase the amount of calories burned throughout the day is the addition of exercise, yet it seems difficult for people to find time to accomplish this with the hectic lifestyle most are living. "Fasted cardio" seems to be a trending form of exercise because it is said to increase the amount of fat metabolized when compared to the state of "un-fasted cardio", theoretically providing more "bang for the buck", in terms of burning more fat for the same exercise bout when it is performed in a fasted state. While people are looking to burn as many calories as possible in an exercise session, they also are more likely to adhere to an exercise program performed at a "comfortable" pace. This study proposes to compare total energy expended and rate of perceived exertion between two exercise conditions: 1) where exercise is completed in

the fasted state and 2) where exercise is completed in the non-fasted state. The experimental sessions will involve a 20-minute treadmill exercise at a running intensity that is self selected. During one experimental session, participants will exercise without ingestion of a carbohydrate meal after a 12-hour overnight fast. For the other experimental session, participants will exercise following ingestion of a carbohydrate meal following a 12-hour overnight fast. Oxygen consumption, total energy expenditure (TEE), heart rate (HR), respiratory quotient (RQ), blood pressure and rating of perceived exertion (RPE) will be measured after every 2 minutes of exercise during the testing in both sessions. We hope the results of our study will help determine the best way to exercise and burn the most calories. This will enhance exercise prescription and help with the obesity epidemic.

### **THE REPRODUCTIVE COST OF FIGHTING AN INFECTION: AN EXAMINATION OF LIFE HISTORY THEORY IN THE MOSQUITO**

Presenter:	Schumacher, Molly
Student Class, Department:	Graduate, Biological Sciences
Mentor(s):	Prof. Steve Juliano
Author(s):	Molly Schumacher, Steve Juliano

Investment in life history traits such as immune function, reproduction, and soma maintenance is determined by limited available resources, resulting in trade-offs within these traits to maximize lifetime fitness of an individual. A life-history trade-off may occur when an upregulated immune response to combat an infection may further restrict energy investment into reproductive efforts and reduce reproductive success. Pathogenic infections may alter physiological capacities by causing lesions or deficiencies that affect mating performance, or deprive the individual of energy necessary for high levels of exertion, metabolism, and locomotion necessary for male courting, thus reducing mating success. Conversely, the Terminal Investment Hypothesis suggests that an infected individual may enhance energy investment in reproductive efforts to maximize terminal reproductive success in response to the survival threat inherent to infection. In the latter case, females are predicted to prefer mating with immunocompromised males, preferring dishonest epigamic signals despite the male's lack of immunological resistance (being infected by a pathogen). To determine whether immunocompromised males will display honest or dishonest reproductive signaling, binary-choice mating trials were conducted with an *Aedes aegypti* female and 2 males: a control (unmanipulated), and an immunocompromised male (either infected with *Escherichia coli*, heat killed *E. coli*, or sham injected with phosphate buffer saline). Male and female reproductive success and survivorship were monitored to determine fitness differences between treatments. Immunocompetence was measured 48 hours post-infection to compare immune responses between treatments, and thereby disentangling differences in the effects of a real infection, as opposed to simply upregulating immune function in response to immune-active but inviable bacteria. The outcome of this study may be important in understanding current population control efforts (especially those that rely on male mating behavior, a contributor to controls such as sterile male techniques). Mosquito mate choice behavior is poorly investigated but important for success of those control efforts.

## **AGE AND PROVENANCE OF QUARTZITE CLASTS IN TERTIARY CONGLOMERATES, WESTERN BIG HORN BASIN, WY USING DETRITAL ZIRCON U/PB GEOCHRONOLOGY**

Presenter: Scroggins, Mary Ann  
Student Class, Department: Undergraduate, Geography-Geology  
Mentor(s): Prof. David Malone  
Author(s): Mary Ann Scroggins, David Malone, John Craddock

Quartzite cobble conglomerates occur within the Tertiary strata of the western Big Horn Basin. Our goal in this research is to characterize the age and provenance of these clasts using detrital zircon U/Pb Geochronology. As part of this study, we sampled three different formations (#332 zircon analysis total). The Paleocene Fort Union Formation was sampled along Grass Creek (#83). The lower Eocene Willwood Formation was sampled at two localities: along Gooseberry Creek (#84) and near Meeteetse (#96). The middle Eocene Wapiti Formation was sampled at Jim Mountain (#70). Meso- and Paleoproterozoic (1300-2000 Ma) dominated each of the samples, ranging from 79-87%. Each locality also contained smaller amounts of Archean (>2500 Ma 7-17%) and Grenville (950-1200 Ma; 6-10%). The most abundant age for each sample is 1650-1700 a. The similarity of detrital zircon signatures indicates that these rocks were most likely derived from the same source area, which is the Sevier highlands to the west. The sandstone protolith of these quartzites were eroded from Yavapai-Mazatzal rocks and then transported north to the Neoproterozoic continental margin of Idaho and Montana. These quartzites were then uplifted during the Sevier orogeny, were weathered, and shed as clasts east into the Western Interior Basin during early Tertiary time. These quartzite clasts have similar detrital zircon spectra to the time equivalent Harebelle and Pinyon Formations to the west.

## **DEPRESSION, DOES IT GET BETTER IN A SUBSTANCE TREATMENT PROGRAM?**

Presenter: Sellek, Randi  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Wehrmann  
Author(s):

Dual diagnosis has recently been recognized as a serious problem in society. Because it is relatively new to the Diagnostic and Statistical Manual user population, there are not many studies related to the issue, specifically depression and substance abuse. Most of the research that has been completed revolves around the shortage of dual diagnoses treatment facilities. Within the last 30 years, researchers have started to recognize that this is a large gap in services to clients in need. Although there has not been a substantial amount of research done about the benefits of dual diagnosis treatment facilities and how they can decrease patient depression levels, it is clear by the existing literature that there is a need for more such facilities, but with a lack of resources, this is hard to achieve. This evaluation project will be conducted to explore existing data to compare changes in depression levels of inpatient substance abusers upon their admission to a treatment facility and after their successful discharge from said program. The co-PI who will carry out the project is an MSW intern and employee of the agency, Illinois Institute for Addiction Recovery (IIAR).

## **FORMATION AND DECOMPOSITION OF TRIARYL ISOCYANURATE DIANIONS**

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

The full and partial reduction of both phenyl and p-tolyl isocyanate in tetrahydrofuran (THF) were carried out using either potassium (K) metal or sodium (Na) metal. For those experiments using K metal, the compound 18-crown-6 ether was also present in the THF solution. 18-Crown-6 was used because it readily encapsulates K<sup>+</sup> cations and assists in the formation of solvated electron. Experiments involving the Na metal reduction of these aryl isocyanates reveal that a stable isocyanurate dianion forms, which has been detected using NMR spectroscopic techniques. Remarkably, when a THF solution containing the aryl isocyanate/18crown-6 mixture is reduced with K metal, no isocyanurate dianion is observed, but is found to undergo a rapid decomposition process. The products from this decomposition will also be discussed.

## **WHAT DOES LENGTH SOUND LIKE?**

Presenter: Shepherd, Carlie  
Student Class, Department: Undergraduate, Psychology  
Mentor(s): Prof. Jeffrey Wagman  
Author(s):

While people typically rely on the visual system to perceive spatial properties such as size, distance, and shape, the auditory system can also allow for perception of such properties. In two experiments, we investigated whether people can perceive the length of wooden rods simply by listening to the sound that those rods make when they fall on a hard surface. In experiment 1 twenty rods (varying in both length and diameter) were dropped to a hard surface from a constant height. Participants listened to each rod from behind a curtain and reported perceived length by reproducing the length of the rod using a pulley. The results showed that both length and diameter of the rods influenced perceived length. Experiment 2 consisted of a pre-test, practice, and post-test. Half of the participants received feedback on their performance during the practice session, and half did not. Performance improved for those participants receiving feedback during practice and did not change for those participants not receiving feedback during practice.

## **SUB-SECOND MEASUREMENT OF ELECTRICALLY-EVOKED DOPAMINE RELEASE IN THE EUROPEAN STARLING**

Presenter: Smith, Amanda  
Student Class, Department: Graduate, Biological Sciences  
Mentor(s): Prof. Joseph Casto  
Author(s): Amanda Smith, Joseph Casto

In the striatum and nucleus accumbens, dopamine is released in response to novel or otherwise salient sensory stimuli, and recently, it has been hypothesized that this dopamine may encode the “incentive salience”, or incentive value, of incoming information. Thus far, dopamine release in response to drug or food presentation has been fairly well characterized, but the role of

dopamine in processing complex, naturally salient stimuli, such as social or sexual signals, remains largely unexplored. While mammalian models of dopaminergic activity have been invaluable in the study of addiction and other maladaptive behaviors, the clarity and distinct ecological context of social signaling in songbirds make them a desirable model for investigating the relationship between neural signaling and social signal perception.

To address this, we have recently implemented fast-scan cyclic voltammetry (FSCV), a powerful technique able to measure sub-second changes in electroactive chemicals, to quantify dopamine overflow in the striatum of a songbird, the European starling. We inserted carbon fiber microelectrodes into the striatum and nucleus accumbens of deeply anesthetized starlings, and electrically evoked dopamine overflow by stimulating the ventral tegmental area, a dopamine producing region of the brain. This represents, to our knowledge, the first *in vivo* use of this technique in a non-mammalian vertebrate. Here we describe the characteristics of *in vivo* dopamine release and regulation in the European starling, and make comparisons to the rat, a common mammalian model. This work is an important first step in establishing FSCV, a technique allowing specific, real-time quantification of dopamine, in a songbird system, thereby laying the groundwork for future studies investigating dopamine release during complex social stimuli.

#### **STATISTICAL ANALYSIS OF THE PICK 4 GAME OF THE ILLINOIS LOTTERY**

Presenter: Snodgrass, Jack  
Student Class, Department: Undergraduate, Accounting  
Mentor(s): Prof. Mary Rotsch  
Author(s):

Many people find themselves asking “How can I make money fast?” at least once in their life. If you have ever thought about this, you have most likely thought about playing the lottery. The lottery rewards its players by paying out millions of dollars for guessing numbers that are drawn at random. Seems easy enough right? The odds of winning the Mega Millions jackpot are roughly 1 in 258,000,000. But if you can pull it off, you will be rewarded with a minimum of \$15 million. The largest payout in lottery history was in 2012 and paid out \$656 million in cash! Mega Millions is not the only game available to play; each state has their own lottery that features a variety of games available to play. The game that I will be analyzing is the Pick 4 which has drawings that take place twice per day. I will be performing multiple statistical tests to determine whether or not the numbers become more evenly distributed as time goes by. I gathered data from the Pick 4 game during the months of May through November. After I decided I would like to analyze the Pick 4 game, I went about gathering all of the necessary data. I did this by going on to Illinois Lottery’s website where you can access all winning lottery numbers from the past. I used all of the winning numbers from May 2013 to November 2013. There are two drawings per day, so I organized the data into two different histograms for each month; one for midday and one for evening. In the graphs, I show each number, 0 through 9, and the frequency in which they occurred for that certain month. I then made a running total of the frequency and made histograms that show how the frequency evens out over time. After gathering all of the necessary data, there were a few things that stuck out to me right away. I noticed that the numbers were very inconsistent and did not seem to follow any pattern. For example, the number four was picked 36 times in the month of July and only

picked 20 times in the month of August. There were multiple other examples that were similar to this one. I also noticed that each of the months, when viewed separately, were very inconsistent but the compounded months get closer to an equal distribution as more months are added.

### **THE RELATION BETWEEN MINDSET AND MEMORY; MEMORY ERROR DIFFERENCES ACROSS THE SPECTRUMS OF MOOD AND COGNITIVE STYLE**

Presenter: Steakley-Freeman, Diana  
Student Class, Department: Undergraduate, Psychology  
Mentor(s): Prof. Dawn McBride  
Author(s): Diana Steakley-Freeman, Dawn McBride

The study of false memories has been of particular interest to cognitive psychologists in the past few decades (Gallo, 2010). False memories occur when an individual remembers an event inaccurately. Such memory errors have important legal implications in cases where victims and eyewitnesses testify about events they remember (Howe & Conway, 2013). Given the importance of accurate memory in these cases, our understanding of the situations and individual differences that contribute to the creation of false memories is vital in predicting when and to whom they are most likely to occur.

Clinical psychologists have studied the cognitive information processing styles of clinical and subclinical populations in interpreting and predicting events with an emphasis on the emotions connected with the events. Studies (Watkins & Teasdale 2004; Seligman, et al. 1984; Raps et al., 1982) have shown that depressed individuals tend to magnify negative emotion and minimize positive emotion. Thus, depressed individuals predict fewer positive affective outcomes of a positive event, and exaggerated negative outcomes of negative events (Beck, 1988).

Furthermore, they tend to predict a higher quantity of negative life events compared to positive ones, and in so doing, predict more intense negative emotion. Thus, a depressed individual is likely to be emotionally taxed after witnessing a negative event (e.g., a crime) due to their negative-focused cognitive style.

The present study is designed to examine the relationship between cognitive attribution style, depression, and the creation of false memories of negative stimuli. Participants will complete several well-validated measures of these constructs in the hopes of determining if (a) individuals with high scores on negative cognitive attribution styles and depression questionnaires (BDI-II; Beck, 1991) are more or less likely to create false memories overall than individuals with lower scores on these measures, and (b) if individuals with high scores on these measures show more false memories for negative lists than neutral lists. Participants will complete a list-learning memory procedure known as the DRM (Roediger & McDermott, 1995). This procedure was developed to induce simple false memories for list items in a controlled setting. Researchers interested in clinical and cognitive psychology could benefit from the results of this study, as well as individuals who are practicing in a mental health field working with individuals who are depressed, or individuals who appear prone to false memory creation.



## **EFFECTS OF PRE- AND POST-NATAL CORTICOSTERONE ON FITNESS RELATED TRAITS IN NESTLING HOUSE WRENS (*TROGLODYTES AEDON*)**

Presenter: Strange, Meghan  
Student Class, Department: Graduate, Biological Sciences  
Mentor(s): Profs. Charles Thompson, Scott Sakaluk  
Author(s):

Corticosterone is a glucocorticoid hormone present in birds and is involved in modulating behavioral and physiological responses to environmental challenges. Corticosterone secretion in response to environmental challenges is beneficial to an individual, but prolonged exposure to elevated corticosterone levels can be detrimental. Corticosterone is included in the hormonal environment during both the pre-natal (i.e., embryonic) and post-natal (i.e., nestling and fledgling) stages of avian development. Although corticosterone is essential for development, exposure to elevated concentrations can have significant organizational phenotypic effects on offspring and can therefore affect Darwinian fitness.

This study tested the hypothesis that elevated pre- and post-natal corticosterone levels within the physiological range modify offspring development and phenotype in house wren (*Troglodytes aedon*) nestlings. Corticosterone levels were elevated pre-natally through egg injections and elevated post-natally through diet. I measured the fitness-related traits mass, hematocrit, tarsus length, and immune response of nestlings 11 days after the first egg of the clutch hatched. Preliminary results reveal that fitness-related traits in nestling house wrens are not affected by pre- and post-natal corticosterone elevation.

## **VARIATIONS IN DEFINING TORTURE**

Presenter: Suhi, Michelle  
Student Class, Department: Undergraduate, Politics and Government  
Mentor(s): Prof. Michaelene Cox  
Author(s):

This research investigates the ways in which definitions of torture differ between international law and U.S. law, and the effect these inconsistencies have on U.S. foreign relations and international conflict in general. An in-depth study of the language used in international and U.S. policy was used to compare any similarities or differences between the two. After identifying if any inconsistencies exist, the War on Terror is used as a backdrop to investigate and illustrate practices that are contradictory to international laws as they are written.

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

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

New technology in the field of forensics is in development that will allow the quick identification of unknown forensic samples at the scene of the crime. This will reduce the backlogging, which many crime labs suffer from due to the overwhelming amount of evidence they receive. With a portable mass spectrometer, currently being developed by Dr. Christopher C. Mulligan, crime

scenes could reduce this backlog and be able to analyze samples at the scene of the crime including drugs of abuse, explosives, and poisons. One variable in the process of collecting this evidence is the extraction and transfer efficiencies of commonly available swabs. Previous research shows that swabbing with a solvent, such as methanol, is superior to a dry swab. However, the amount of analyte that can be recovered by a swab is determined by the amount of solvent applied to the swab, the amount of total solution the swab can support, and the intrinsic properties of the swab itself.

### **DIMENSIONAL REDUCTION WITH NOVEL VANADIUM(IV/IV) PHOSPH(ON/IN)ATE BRIDGED DIMERS: THE SEARCH FOR BETTER VANADIUM-BASED OXIDATION CATALYSTS**

Presenter: Tarlton, Michael  
Student Class, Department: Graduate, Chemistry  
Mentor(s): Prof. Craig McLauchlan  
Author(s): Michael Tarlton, Craig McLauchlan

A series of novel vanadium(IV/IV) organophosphorus and oxalate bridged dimers have been synthesized and characterized. Dimensional reduction has been used to design these complexes for the purpose of modelling the VO<sub>6</sub> environment found in the heterogeneous extended solid oxidation catalyst, VOPO<sub>4</sub>. A variety of characterization methods have been employed, including spectroscopy, X-ray diffraction, and electrochemical analysis. Initial oxidation catalysis data will be presented here.

### **CHARACTERIZATION OF YOLK GLUCOCORTICOIDS AND THEIR METABOLISM DURING THE EMBRYONIC DEVELOPMENT OF THE RED-EARED SLIDER (TRACHEMYS SCRIPTA)**

Presenter: Treidel, Lisa  
Student Class, Department: Graduate, Biological Sciences  
Mentor(s): Prof. Rachel Bowden  
Author(s): Lisa A. Treidel, Ryan T. Paitz, Rachel M. Bowden

Oviparous vertebrate eggs contain a number of steroids, including glucocorticoids, at the time of laying. During embryonic development, maternally derived glucocorticoids can act to modify the offspring's phenotype, while embryonically produced glucocorticoids are important for hatching. The multiple roles of glucocorticoids make it likely that regulating the timing of embryonic exposure throughout development is necessary for proper offspring development and hatching. Yet, little is currently known about the mechanisms by which this occurs, especially in oviparous reptiles such as the red-eared slider (*Trachemys scripta*). In our first study, we characterized the changing concentrations of yolk corticosterone occurring during embryonic development. Eggs from ten clutches were sampled throughout incubation and yolk corticosterone was quantified via a radioimmunoassay. We found that while prior to the start incubation only trace amounts of corticosterone are present, late in development, yolk corticosterone levels spike. Next, to investigate the metabolism and movement of corticosterone during embryonic development, we topically applied 150,000 cpm of tritiated corticosterone to eggs. Using eggs sampled at different points in development, an ether extraction was used to separate and quantify ether soluble and water soluble metabolites in the yolk, extraembryonic fluid, and embryo. From this study we found that applied corticosterone is rapidly metabolized during development and remains as metabolites mostly in the yolk and

extraembryonic fluid. Together, these two studies suggest that the glucocorticoid environment is subject to modulation prior to the embryonic production of glucocorticoids.

### **HETEROGENEOUS CATALYTIC PROPERTIES OF GOLD NANOPARTICLES UNDER LIGHT IRRADIATION**

Presenter: Twaddle, Katrina  
Student Class, Department: Graduate, Chemistry  
Mentor(s): Prof. Jun-Hyun Kim  
Author(s): Katrina Twaddle, Luis Garcia, Jun-Hyun Kim

This study describes the catalytic property of gold nanoparticles upon exposure to a solar-simulated light. As metallic gold nanoparticles exhibit a unique ability to absorb light energy and convert it into heat (i.e., the photothermal heating process), we investigated high photon-to-heat conversion efficiency under solar-simulated light irradiation. Subsequently, these nanoparticles were utilized in a model chemical reaction to evaluate their catalytic activities as a function of gold nanoparticle concentrations with and without solar light. The highly increased reduction of 4-nitrophenol to 4-aminophenol was observed in the presence of gold nanoparticles in solution and on a filter paper substrate with light irradiation. The use of photothermally active gold nanoparticles in chemical reactions can result in the development of efficient, high-yielding and cost-effective catalysis systems. In particular, substrate supported chemical reaction systems under sunlight could mimic highly practical and recyclable heterogeneous catalytic systems without electrical thermal input.

### **A DENSITY FUNCTIONAL ANALYSIS OF DONOR-ACCEPTOR COMPLEXES FORMED BETWEEN ETHERS AND SULFUR TRIOXIDE OR SULFUR DIOXIDE**

Presenter: Van Den Driessche, George  
Student Class, Department: Graduate, Chemistry  
Mentor(s): Prof. Jean Standard  
Author(s): George Van Den Driessche, Jean Standard

Sulfur dioxide (SO<sub>2</sub>) and sulfur trioxide (SO<sub>3</sub>) are key components in the formation of atmospheric sulfuric acid through a key intermediate with a water donor molecule. However, the activation energy of this pathway is significantly large (26 kcal/mol). Previous studies have shown that sulfur dioxide and sulfur trioxide will form partially bonded donor-acceptor complexes with other aerosols, specifically ethers. This study uses a density functional theory approach to analyze the properties of these donor-acceptor complexes. Geometry optimizations and complex analysis were performed using the Gaussian03 software package at the B3LYP level of theory with the aug-cc-pVDZ basis set. Significant trends were found for ether-SO<sub>3</sub> complexes correlating to binding energy, bond length, bond angle, charge transfer, and ether basicity. Less significant trends were also found with ether-SO<sub>2</sub> complexes. This difference is believed to be a result of the differing geometries and bonding capabilities of SO<sub>2</sub> and SO<sub>3</sub>. The ether-SO<sub>2</sub>/3 complexes will also be analyzed in the condensed phase in order to compare with previous studies of related compounds that have demonstrated significant differences between gas phase and condensed phase properties. Due to the easy accessibility of sulfur in SO<sub>2</sub>/3 for partial bonding with multiple ethers, ether-SO<sub>2</sub>/3-ether (sandwich) complexes also have been studied. It is hypothesized that by substituting a water molecule for one of the ethers in the sandwich complex the activation energy for the formation of sulfuric

acid may be lowered. Preliminary studies have shown significant changes in binding energies, bond lengths, bond angles, and charge transfer of these complexes.

### **USING STABLE HYDROGEN ISOTOPES AND GIS TOOLS TO ESTIMATE GEOGRAPHIC EXTENTS OF SOURCE POPULATIONS OF TREE BATS KILLED AT A CENTRAL ILLINOIS WIND FARM**

Presenter: Van Essen, Rachael  
Student Class, Department: Graduate, Biological Sciences  
Mentor(s): Profs. Angelo Capparella, John Kostelnick  
Author(s): Angelo Capparella

Bats are killed at an astonishing rate by wind farms—an estimated 600,000 nationwide in 2012. Approximately 75% of these bats are of three species, the Eastern Red (*Lasiurus borealis*), Hoary (*Lasiurus cinereus*) and Silver-haired (*Lasionycteris noctivagans*). While the number seems large, we have little understanding of the impact of this high mortality on these species' population persistence, in part because we have poor knowledge of their breeding sites and migration pathways. The use of stable isotopes in body tissues to determine both summer range and migration pathways of animals is an increasingly successful method for elucidating geographic patterns. In my research, I focus on the Eastern Red and Hoary bats using the method of deuterium isotope ratio ( $\delta D$ ) analysis in a novel way through combining ecological niche modeling (GARP: Genetic Algorithm for Rule-set Prediction) with a web-based isotope modeling program (Isomap: Isoscapes Modeling, Analysis, and Prediction). My goal is to determine whether the bats being killed at an Illinois wind farm are coming from a large portion of their summer geographic range or from only a small segment. I first completed a pilot study investigating differences in  $\delta D$  among bat hair and claws to determine the best tissue type and sampling method for elucidating their summer geographic extents. This second part of my research will serve to help understand autumn migration patterns through central Illinois in terms of their northern extents. It will also be an important stepping stone towards understanding population and long-term impacts that the high mortality suffered at wind farms will have on these two species.

### **COLLEGE STUDENTS USE OF COUNSELING SERVICES: REMOVING THE BARRIERS**

Presenter: Vogel, Beth  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Sheridan  
Author(s):

Campus counseling centers nationwide, including the Heartland Community College Student Counseling Center, report mental health problems growing on campuses, including anxiety and depression. One commonly expressed source of anxiety for students on college campus is academic stress, including anxiety related to mathematics courses. Unfortunately, there is a gap between the number of students that identify needing help for their math anxiety and those who choose to participate in support groups specific to minimizing math anxiety. The current literature suggests ecological factors, including stigma, gender, culture, experience & knowledge, fear and accessibility that influence a college student making professional help-seeking decisions.

The purpose of this study is to identify and explore the relationship among key factors associated with college student's use of the math support group at Heartland Community College called the Math Confidence Support Group. This study seeks to identify the ecological factors associated with students' use of counseling programs and services among a group of students who are enrolled in a math course at Heartland Community College in Normal, IL. Participants will be invited to take part in a survey regarding their participation in the Math Confidence Support Group. The survey findings will provide insights into why the Math Confidence Support Group, offered by the Student Counseling Center, is often not taken advantage of and potential ways to make the support group more accessible and comfortable for the increasing number of students that may benefit from this service. In addition, findings will help Student Counseling Center administrators and staff explore ways to overcome barriers to students using counseling programs and services, and therefore increase the use of student counseling services on campus.

### **TOPICS OF CONFLICT IN ROMANTIC RELATIONSHIPS**

Presenter: Weber, Brittany  
Student Class, Department: Undergraduate, Psychology  
Mentor(s): Prof. Marla Reese-Weber  
Author(s):

The proposed study investigated distinctive topics of conflict demonstrated in romantic relationships. Undergraduate students (N = 293) completed measures of romantic relationship development, topics of conflict, and level of intimacy regarding their current romantic partner. This study predicts that women will report more conflict regarding intimacy in their romantic relationships as compared to men. Additionally, this study predicts that men will report more conflict regarding sexual behavior in their romantic relationship as compared to women.

### **SEASONAL TEMPERATURE FLUCTUATIONS EXPERIENCED IN THE IMMATURE LIFE STAGE ON ADULT LONGEVITY IN *Aedes triseriatus***

Presenter: Westby, Kathleen  
Student Class, Department: Biological Sciences, Graduate  
Mentor(s): Prof. Steven Juliano  
Author(s): Katie Westby, Steven Juliano

Mathematical models of mosquito transmitted diseases suggest that adult longevity is an important factor for determining disease risk. As endothermic organisms, temperature controls mosquito growth and development. It is well understood that below a critical maximum, hotter temperatures decrease development time and adult size. Adult size is highly correlated with fecundity, but it is less well understood how size is related to longevity and how temperatures experienced in the larval habitat influence adult longevity. Most experimental studies that have investigated temperature effects use constant temperature treatments and ignore effects of daily and seasonal temperature fluctuations that mosquitoes encounter under natural conditions. In a laboratory experiment, I simulated daily temperature and photoperiods consistent with those experienced in the St. Louis, MO region in July and August to test the hypotheses that 1) larval *Aedes triseriatus* mosquitoes developing under different seasonal conditions will differ in size and adult longevity 2) that fluctuating temperatures will affect size and adult longevity differently than constant temperatures yielding the same mean value.

Despite early differences in survival probability, there was no statistically significant difference between the two season treatments. Both season treatments differed significantly in size and longevity from the constant temperature control, which experienced reduced longevity. These results suggest seasonal temperature fluctuations do not affect adult longevity in *Aedes triseriatus*, but that naturally fluctuating temperatures may affect life histories.

#### **AMBIENT GROUP AFFECT AND CHILDCARE WORKERS' JOB ATTITUDES AND BEHAVIORS**

Presenter: Whitely, Aaron  
Student Class, Department: Graduate, Psychology  
Mentor(s): Prof. Kimberly Schneider  
Author(s): Aaron Whitely, Kimberly Schneider, John Binning

This study of 17 childcare center work groups examined the influence of consistent positive and negative affective mood on employees' job attitudes and withdrawal. We demonstrated that work group mood, or tone, that is consistently negative is related to lowered employee pay satisfaction, greater stress, and thoughts of quitting. These effects were even apparent after taking into account the employees' tenure at their childcare center and the employees' overall positive or negative disposition. In work groups that had been together for shorter time periods, these relationships were weaker than in work groups who had been together longer.

#### **WILL A SIX WEEK SOCIAL SKILLS GROUP INTERVENTION INCREASE POSITIVE RELATIONAL BEHAVIORS IN ELEMENTARY SCHOOL AGED CHILDREN?**

Presenter: Williams, Linda  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Wehrmann  
Author(s):

The majority of children who have been placed in foster care have experienced trauma related but not limited to, impaired parenting, domestic violence, physical abuse, and neglect. Children who have experienced trauma are at risk for negative long term emotional problems (Felitti, Anda, Nordenbert, Williamson, Spitz, Edwards, Koss, & Marks, 1998). Because of these emotional problems, foster children engage in inappropriate social behaviors which make it difficult for some caregivers to attach and leads to multiple foster home placements and further traumatization to the children (Dozier, Lindhiem, Lewis, Bick, Bernard, and Peloso, 2009; Leslie, Hurlburt, Landsverk, Rolls, Wood, & Kelleher, 2003; and Jee, Conn, Szilgyi, P., Blumkin, Balkwin, & Szilgyi, M., and Sinclair & Wilson, 2003). A positive relationship between foster children and foster caregivers has been positively associated with decreased negative behaviors (Oosterman & Schuengel, 2008). In order to address the social skills needs of these children, the counseling department of a local child welfare agency in the Midwest implemented the Skillstreaming Social Skills training curriculum. The evidenced based curriculum requires the child to watch someone else use the skill, try out the skill, receive feedback on his/her performance and engage in real life situations that allow them to practice the skill. De-identified data collected from this group will be analyzed to determine if teaching social skills to elementary school aged children improves social behaviors and decreases negative behaviors in the foster home.

## **EFFECTIVE PARENTAL ADVOCACY**

Presenter: Williams, Madeline  
Student Class, Department: Undergraduate, Special Education  
Mentor(s): Prof. Julia Stoner  
Author(s):

The purpose of this qualitative study was to investigate components of parental advocacy. The specific research question that focused this study was, What are the personality, life experiences, and communication skills that contribute to effective parental advocacy? A parent advocate, who has been interviewed XX times over the past 10 years, of a child with autism spectrum disorder (ASD) was the participant. Line-by-line coding was conducted on all interviews, including the one completed for this study. Themes emerged, were refined, expanded and/or deleted. Results identified the importance of advocacy, an instinctive response to advocate, and the personal commitment required to be an effective advocate for one's child with ASD. Specific participant advocacy dispositions included; (a) respect for others' opinions, (b) sense of self-efficacy, and (c) attitude of non-judgment. Factors that maintained and facilitated the parent's advocacy were (a) connecting with community organizations, (b) empowering others to become advocates, and (c) recognizing progress and accomplishments.

## **ATTENTION TESTS: DECREASING THE DISCREPANCY BETWEEN SELF-REPORT TESTS AND PERFORMANCE MEASURES OF ATTENTION ABILITY**

Presenter: Wing, Ellen  
Student Class, Department: Undergraduate, Psychology  
Mentor(s): Prof. W. Joel Schneider  
Author(s): Ellen Wing, W. Joel Schneider

The enduring discrepancy between self-report tests of attention ability and actual attention ability has presented a major difficulty in the diagnosis of attention disorders, such as Attention Deficit Hyperactivity Disorder. The aim of this research is to strengthen the relationship between self-report tests of attention ability and actual attention ability by means of objective self-awareness theory.

## **FROM THE IDEAL TO REALITY: SWEDISH GENDER POLITICS**

Presenter: Winner, Jayne  
Student Class, Department: Undergraduate, Politics and Government  
Mentor(s): Prof. Michaelene Cox  
Author(s):

Sweden is known as being one of the most gender-egalitarian countries in the world. They believe that men and women should have power and influence equally, and their advanced welfare system provides a system where both men and women can easily balance their work and family life regardless of gender. There is still room for improvement, but because Sweden has been seen to be leading the way in gender equality, it is important to see how far Sweden is going to achieve gender equality-specifically in the workplace and education, so that other countries may follow their lead.

## **EXAMINATION OF ANKLE SUPPORT PROVIDED BY TWO TAPING CONDITIONS DURING EXERCISE**

Presenter: Wisniewski, Andrew  
Student Class, Department: Undergraduate, Kinesiology and Recreation  
Mentor(s): Prof. Justin Stanek  
Author(s): Justin Stanek, Andrew Wisniewski, Olivia Zander

**Context:** A number of studies have shown that prophylactic ankle taping is effective in preventing ankle injuries, however only a few have examined the efficacy of using new self-adhesive taping products.

**Objective:** To examine the ankle support provided by new self-adhesive taping products during exercise in comparison to traditional cloth taping products.

**Design:** Randomized Controlled Clinical Trial

**Intervention:** Participants were randomly divided into one of three groups: traditional cloth tape, self-adhesive tape, or control. After the taping condition is applied, participants completed an exercise protocol to simulate practice/competition.

**Main Outcome Measures:** Ligament laxity using the LigMaster arthometer and ankle range of motion.

## **A COMPARISON OF BIOFEEDBACK TOOLS ON TRANSVERSUS ABDOMINIS ACTIVATION**

Presenter: Wooldridge, Jessica  
Student Class, Department: Graduate, Kinesiology and Recreation  
Mentor(s): Prof. Noelle Selkow  
Author(s): Todd McLoda

Biofeedback is a technique used to allow the patient to see visually the muscular activity. However, there has been little evidence investigating the most effective biofeedback tool in measuring adequate transverse abdominis activation. Ultrasound imaging biofeedback provides immediate real time images as visual feedback to the patient. This information allows the patient to watch the muscle activity of the transverse abdominis change in shape and length on the display screen. A pressure biofeedback unit (PBU) allows the patient to receive visual biofeedback through monitoring the gage of the PBU for pressure changes during muscular contractions. Therefore, the purpose of this study is to determine the effectiveness of biofeedback tools on Transverse abdominis activation in a single intervention session. Participants will be in one of four groups: ultrasound biofeedback, pressure biofeedback (PBU), ultrasound + pressure biofeedback, and a control group who does not receive any biofeedback. Initial baseline ultrasound measurements are taken assessing the effectiveness of transversus abdominis (TrA) activation. This is done by evaluating the thickness of the TrA in resting and contracted states 3 times with instruction to perform an abdominal drawing-in maneuver (ADIM) with the following instruction: "inhale then exhale, at the point where you can no longer exhale draw your belly button to your spine". Then the subject is allowed to use biofeedback (depending on group assignment) and receive proper verbal cueing during 10 ADIMs. The control group is only instructed verbally how to perform an ADIM. After the 10 trials, 3 more



images are taken of the TrA in a rested and contracted state. We believe that the ultrasound + PBU group will have the greatest increase in transversus abdominis activation compared to the other groups. If we find that biofeedback is an effective tool, we feel that clinicians will be able to incorporate these techniques into a rehabilitation program, especially for people with low back pain.

## **OSTRACISM, HELP-SEEKING AND SELF DISCLOSURE IN PARTICIPANTS WITH A STIGMATIZING SECRET**

Presenter: Wooten, Tommy  
Student Class, Department: Undergraduate, Psychology  
Mentor(s): Prof. Eric Wesselman  
Author(s): Tommy Wooten, Diana Steakley-Freeman, Eric Wesselmann

Stigmatized individuals experience multiple barriers to help-seeking and often do not feel comfortable disclosing their status to potential supporters. What are the psychological effects of censoring oneself instead of disclosing stigmatizing information to someone? We investigated the degree to which self-censorship made individuals feel ostracized and threatened their basic psychological needs (i.e., belonging, self-esteem, control, and meaningful existence). Further, we investigated how self-censorship influenced individuals' help-seeking intentions. Previous data show that individuals can relive previous experiences of social pain, albeit temporarily (Chen, Williams, Fitness, and Newton, 2008). We adapted this reliving paradigm and manipulated whether participants recalled one of three autobiographical experiences. Participants (N=195) recalled a time in their life when they 1) wanted to disclose a personal problem to someone but they chose to self-censor instead, 2) wanted to disclose a personal problem to someone and chose to share, or 3) recalled the last song they listened to (control condition). We measured the effect of this recall manipulation on participants' retrospective basic need satisfaction and feelings of ostracism (i.e., feeling ignored and excluded) in addition to their current feelings of ostracism (Williams, 2009). We also measured participants' help-seeking intentions. Finally we measured participants' individual differences in perceived stigma.

Participants who recalled withholding their problem reported experiencing significantly lower need satisfaction compared to the control condition ( $p=.30$ ); self-censorship induced feelings of ostracism. Participants who recalled withholding their problem also reported significantly more current feelings of ostracism compared to the control condition ( $p=.01$ ,  $d=.69$ ) and the sharing condition.

Our findings suggest that individuals who avoid disclosing potentially stigmatizing information do not just suffer the loss of social support; they also experience a subtle form of ostracism. This has important implications for both basic and applied psychologists interested in disclosure, help-seeking, and stigma.

## **CIRCADIAN AND LIGHT DRIVEN MODULATION OF RHYTHMIC MOTOR ACTIVITY IN THE INTACT CRAB CANCER BOREALIS.**

Presenter: Yarger, Alexandra  
Student Class, Department: Graduate, Biological Sciences  
Mentor(s): Prof. Wolfgang Stein  
Author(s): Alexandra M. Yarger, Wolfgang Stein

Virtually all physiological processes vary rhythmically over time and it has been well established that such variations can occur in response to changing endocrine and neuromodulatory conditions. Circadian rhythms with periods around 24 hours are controlled by internal biological clocks that regulate the timing of hormonal release and neuronal activity (Hastings et al. 2007, *J Endocrinol*, 195). The resulting changes in behavior over time are well documented in many animals (Bell-Pedersen et al. 2005, *Nature Rev Genet*, 6.7). However, the process by which biological clocks affect the motor circuits driving these behaviors has not been well described, despite the fact that many motor circuits are controlled by neuromodulatory neurons and are subject to hormonal influences (Marder and Bucher, 2007, *Annu. Rev. Physiol.* 69). We hypothesize that modulatory pathways cause long-term changes in neurons of motor circuits that mediate circadian fluctuations in activity. To test this, we are using the well described pyloric motor circuit in the crab stomatogastric nervous system (Stein, 2009, *J Comp Physiol A*, 11). This triphasic rhythm is constantly active and controls filtration of food in the crab foregut. All neurons in the pyloric circuit, plus their connections, and descending neuromodulatory pathways have been identified, allowing us to study the cellular actions of hormonal and neuromodulatory influences. Here, we performed in vivo long-term recordings of the pyloric rhythm. Three different light conditions were used, either 12 hours dark/12 hours light, 24 hours dark, or 24 hours light. Extracellular recordings were used to determine the frequency of the pyloric rhythm and the activity patterns of pyloric motor neurons. Data were sampled every half hour. Our preliminary results suggest a light dependence of pyloric cycle frequency, but not a visible circadian effect: Cycle frequency under the 12 hours dark/12 hours light conditions was faster during the daytime hours than during night hours. In constant light, in contrast, cycle frequency did not change over the course of a day and in constant darkness cycle frequency was faster during nighttime hours than during daytime hours. No consistent changes in the patterning of the neuronal activity were observed so far.

Our preliminary data indicate a light dependence rather than a circadian influence on the frequency of the pyloric rhythm. We are currently testing whether the light influence occludes circadian influences on the pyloric cycle frequency and we are assessing circadian influences on burst durations and spike activity patterns of the pyloric motor neurons.

## **SIGNIFICANT OTHER - A PROBE INTO THE GENERATION DICHOTOMY IN CONTEMPORARY CHINESE AMERICAN THEATRE**

Presenter: Zhang, Rui  
Student Class, Department: Graduate, Theatre  
Mentor(s): Prof. Ann Haugo  
Author(s):

This paper adopts Lacanian and Slavoj Žižek's theories in terms of literature and psychoanalysis

to guide the close reading of F. O. B by David Henry Hwang. Through the analysis of the script and the psychology of the characters in the play, a new interpretation of the generation gap reflected in the contemporary Chinese American theatre could be formed. The reception barrier, which interrupts the delivery of expressing the original idea, has been distorting the appreciation of the contemporary Chinese American theatre from its emergence onward. The barrier, or the mismatch between the intention and the presentational effect of theatre, is attributed to the psyche and the context (social politics, recognition of the Chinese American community, etc.), and the understanding of the performance as well as between generations in the performance is misguided by the stereotypes and illusions constructed by the concurrent and past text. As a result, this crowd psychology, crafted from the commonly agreed judgment of the Chinese American theatre, greatly influences the impression of both of playwrights and audience on the contemporary Chinese American theatre, so the unconscious assimilation as in the acculturation and enculturation could, although not favorably, dominate the Chinese American theatre today.

**PARENTING CHALLENGES OF PARENTS/GUARDIANS AFFECTED BY HIV/AIDS THROUGH THE LENS OF STAFF OF RUTH M. ROTHSTEIN CORE CENTER.**

Presenter: Ziniel, Christabel  
Student Class, Department: Graduate, Social Work  
Mentor(s): Prof. Kathryn Wehrmann  
Author(s):

People infected with Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome (HIV/AIDS) and their families encounter different degrees of challenges which disrupt the function of their personal lives and that of their families. Great improvement in medication has reduced HIV/AIDS from a terminal disease (“death sentence”) to a chronic disease. That notwithstanding, individuals experience different levels of HIV/AIDS related health problems, stress, depression and anxiety which could negatively impact parenting. Through a qualitative exploratory study, the co-pi seeks to identify and explore challenges faced by HIV/AIDS infected parents and care givers in parenting their children.

The exploratory research is intended to gather perceptions on parenting challenges faced by parents/guardians affected by HIV/AIDS through a guided interview with social workers, doctors, mental health providers and other professionals who provide services to infected individuals on daily basis at Ruth M. Rothstein CORE Center in Chicago. Purposive sampling methodology will be used to obtain a sample of 10-12 professionals for the study. The study is intended to provide information that will aid the directors of social and medical services, board of directors of CORE Center and the director of Cook County Health and Hospital Systems (CCHHS) in designing services and programs and allocating funding to help families’ better deal with the problems that may be identified by the study. It is also intended to form the basis for further research into the topic for evidence based practice.

# Group Abstracts

## **CRIME READINESS SURVEY OF SMALL LOCAL RETAIL BUSINESSES**

Primary Group Member: Bacidore, Anthony  
Student Class, Department: Undergraduate, Health Sciences  
Group Member(s): Kami Dodd, Health Sciences, Undergraduate  
Nicole Wright, Health Sciences, Undergraduate  
Cord Rodgers, Health Sciences, Undergraduate  
Kyle Garman, Health Sciences, Undergraduate  
Tanner Piepenbrink, Health Sciences, Undergraduate  
Robert Bergstrom, Health Sciences, Undergraduate  
Mentor(s): Prof. Thomas Fuller  
Author(s): Kami Dodd, Nicole Wright, Anthony Bacidore, Cord Rodgers,  
Kyle Garman, Tanner Piepenbrink, Robert Bergstrom

Workplace violence constitutes 17% of all workplace fatalities in the U.S. Approximately one half of these occur in small business retail establishments. Some studies have indicated a correlation between physical infrastructure (lighting, security systems) and administrative controls (policies, staffing, training), and the likelihood of violent events. The purpose of this study was to survey and determine the level of readiness for crime prevention in our community. Results indicated several gaps and shortcomings in the safeguards against violent crime at businesses in our community. The findings in this study can ultimately provide current and future small businesses with information to potentially reduce workplace violence incidents. These outcomes will be used to develop community outreach crime prevention training and programs for these small business owners/operators.

## **IDENTIFYING THE GOAL STRUCTURES OF UNDERGRADUATE STUDENTS VIS-À-VIS ETHICAL DECISION MAKING**

Primary Group Member: Barton, Aaron  
Student Class, Department: Graduate, Marketing  
Group Member(s): Leyla Orudzheva, Marketing, Graduate  
Mentor(s): Profs. Steven Taylor, Chiharu Ishida, Woojung Chang  
Author(s): Steven Taylor, Ph.D.; Woojung Chang, Ph.D.; Chiharu Ishida, Ph.D.;  
Leyla Orudzheva; Aaron Barton

Segal et al. (2013) present evidence that a problem appears to be emerging in that attitudes of university students toward business ethics appear to be changing in arguably undesirable ways. An argument is presented for increased efforts to bring judgment and decision-making and social psychological theory and practice to bear on this issue in order to assist in pedagogical efforts to strengthen college students' underlying cognitive goal-related value structures. A qualitative method is demonstrated that operationalizes these goal-related value structures. The implications for stakeholders of business colleges are discussed.

## **MATHIEU SUBSPACES OF RINGS OF 3x3 MATRICES OVER CERTAIN FINITE FIELDS**

Primary Group Member: Berg, Jessica

Student Class, Department: Undergraduate, Mathematics

Group Member(s): Amanda Forssander, Mathematics, Undergraduate  
Anna Minter, Mathematics, Undergraduate  
Blake Weaver, Mathematics, Undergraduate  
Jen Jaroch, Mathematics, Undergraduate

Mentor(s): Prof. Wenhua Zhao

Author(s):

The notion of Mathieu subspaces, as a natural generalization of ideals, has been introduced by Wenhua Zhao (a professor at ISU) in 2009. This new notion plays fundamental roles in many different areas of mathematics. In this presentation we discuss some properties and classifications of Mathieu Subspaces for the rings of 3x3 matrices over certain finite fields.

## **COLORFASTNESS AND ABRASION RESISTANCE OF COATED FABRICS WITH FAUX LEATHER EFFECT**

Primary Group Member: Bingham, Taylor

Student Class, Department: Undergraduate, Family and Consumer Sciences

Group Member(s): Annie Kaun, Family Consumer Science, Undergraduate  
Sara Marshall, Family Consumer Science, Undergraduate  
Chyanne Corrigan, Family Consumer Science, Undergraduate

Mentor(s): Prof. Ui-Jeen Yu

Author(s): Taylor Bingham, Annie Kaun, Sara Marshall, Chyanne Corrigan

Coated or laminated fabrics are widely used as faux leather clothing items become very popular for many designers and apparel brands. Coated fabrics with faux leather effect are stylish and less expensive than leather, but provide a similar look. However, coated fabrics are more likely to cause color change or color transfer to other materials, and the coating or laminating easily wears off. Little information about colorfastness and abrasion resistance of coated fabrics used for apparel products is available to consumers. Thus, the purpose of this study was to examine whether coated fabrics with faux leather effect meet desirable product specifications and performance expectations of colorfastness and abrasion resistance engineered for apparel products. Two warp-knitted fabrics of coated faux leather leggings were tested: (1) 94% polyester and 6% spandex purchased from Vera Wang in Kohls and (2) 90% polyester and 10% spandex purchased from The Bongo in Sears. Four colorfastness tests and four abrasion resistance tests were conducted: AATCC 61 Colorfastness to Laundering, AATCC 8 Colorfastness of Crocking, AATCC 15 Colorfastness to Perspiration, and AATCC 119 Color Change due to Flat Abrasion (Frosting); ASTM D 3886 Inflated Diaphragm Method, ASTM D 3885 Flexing and Abrasion Method, AATCC 93 Accelerator Method, and ASTM D 3939 Snagging Resistance of Fabrics. Results indicate coated fabrics with faux leather effect showed poor flat abrasion resistance, snagging resistance, colorfastness to crocking, and colorfastness to laundering in relation to staining. As the variety of different types of coated fabrics increases for apparel products, the quality of coated fabrics must improve to prevent color transfer from the surface

of coated fabrics to other surfaces by rubbing or laundering, as well as to increase resistance to flat abrasion and snagging.

### **UTILITY SCALE PHOTOVOLTAIC ARRAY FEASIBILITY STUDY: CENTRAL ILLINOIS REGIONAL AIRPORT**

Primary Group Member: Bravo, Joe

Student Class, Department: Undergraduate, Technology

Group Member(s): Ashley Blanchard, Technology, Undergraduate  
Laura Loyd, Technology, Undergraduate  
Mike Rose, Technology, Undergraduate

Mentor(s): Prof. Jin Jo

Author(s):

High energy demands, along with a notoriety of leaving a high carbon footprint have always been a problem associated with airports. Given the negative effects excessive carbon dioxide emissions have on the environment, including climate change and acidity increases in the oceans, their large carbon footprint is undesirable. One way to offset a large carbon footprint is through the use of clean, non-carbon emitting energy generation sources on site. Airports have the amount of space needed to support alternative energy generation systems such as solar and wind power systems. This project has determined the technical and financial feasibility of installing a utility scale solar photovoltaic system at Central Illinois Regional Airport. Considering limitations such as permissible space at the airport and Federal Aviation Administration guidelines and policies, the best location for the solar photovoltaic array was assessed. Considering the total installation cost of the array, the available grants and funding, estimated power production, and the current utility costs, payback periods were quantified based upon different array options available. With these calculations the optimal system and placement at Central Illinois Regional Airport were determined.

### **RELATIONSHIP BETWEEN STUDENT AND OBSERVER ACUTE AND SESSION RPE IN A PHYSICAL EDUCATION SETTING**

Primary Group Member: Cabrera, Jenna

Student Class, Department: Graduate, Kinesiology and Recreation

Group Member(s): Betsy Hood, Kinesiology and Recreation, Graduate  
Kelly Winter, Kinesiology and Recreation, Graduate

Mentor(s): Prof. Kristen Lagally

Author(s):

**OBJECTIVES:** The purpose of this investigation was to examine the relationship between Acute and Session ratings of perceived exertion (RPE) reported by students and RPE estimated by a trained observer during physical education class.

**METHOD:** Following a separate training session on RPE which included cognitive anchoring, physical education students in grades six through eight (N=49; Mean age = 12.1±.81 years)

performed one cardiovascular and one muscular endurance circuit, each consisting of three activities. The cardiovascular circuit included slideboard, cycling, and treadmill exercises. The muscular endurance circuit consisted of lower body exercises (i.e. squats and lunges), upper body exercises (i.e. overhead press and shoulder raises) and core exercises (i.e. planks, sit-ups). Each exercise in a circuit was performed for approximately two minutes; thus, each circuit lasted approximately six minutes. Heart rate and RPE for the overall body were recorded by students immediately following each circuit and then again at the end of the entire exercise bout. RPE were measured using mode-specific OMNI RPE Child scales and heart rate was measured using Polar heart rate monitors. An observer trained in physical education separately estimated the Acute and Session RPE of students using an exertional observation technique. Relationships between observer RPE and student RPE were examined using bivariate correlation coefficients, as were relationships between heart rate and both observer and student RPE.

**RESULTS:** A moderate relationship was found between observer and student Acute RPE ( $r=0.30$ ,  $p=0.04$ ) following the cardiovascular circuit. No other significant relationships were found between observer ratings and student ratings, or between observer ratings and student heart rate. Correlations between student Session RPE and heart rate for the cardiovascular circuit were  $r=0.33$  ( $p=.02$ ) and for the muscular endurance circuit were  $r=0.38$  ( $p=.01$ ). Additionally, heart rate was significantly ( $p=.01$ ) correlated with student Acute RPE for the cardiovascular circuit.

**CONCLUSION:** The results found between observer and student RPE indicates that observers may have difficulty estimating the exertion of students in a physical education setting. However, given results from many previous studies indicating a strong relationship between RPE and heart rate, the lack of such results in the present study suggests that measurement error may be occurring when students estimate RPE in a physical education setting. As such, it is difficult to draw conclusions regarding the accuracy of observer ratings. Future research may benefit from including physical anchoring in RPE training sessions for students.

## **OSTRACISM AND FALSE MEMORY**

Primary Group Member: Cialdella, Vincent

Student Class, Department: Undergraduate, Psychology

Group Member(s): James Chamales, Psychology, Undergraduate

Mentor(s): Profs. J. Scott Jordan, Eric Wesselmann

Author(s):

The current study was designed to examine the effects of social ostracism on mental vulnerability and false memory. Past research has shown that individuals who are excluded are more vulnerable to behavioral mimicry. We treated false memory (i.e., remembering events that never occurred or remembering events in an altered way) as a measure of cognitive vulnerability. One hundred forty-three (143) participants took part in a computer-based ball-tossing game, Cyberball, to emulate social inclusion and exclusion. In a control condition, participants were instructed to visualize themselves making breakfast. All participants then listened to an audio file which read a list of 72 words, each corresponding to one of 5 topical false memory cues. Following a 2 minute distraction task, participants were asked to freely

recall the words from the audio file. We hypothesized that the ostracism condition would give rise to more false memories in participants than the inclusion and control conditions. An analysis of the results revealed a significant difference in false memory between the inclusion condition and the control condition.

### **STRATEGIES USED BY EARLY INTERVENTIONIST IN MULTIPLE ENVIRONMENTS**

Primary Group Member: Davidson, Jamie  
Student Class, Department: Undergraduate, Special Education  
Group Member(s): Anna Tess, Special Education, Undergraduate  
Mentor(s): Prof. Maribeth Lartz  
Author(s):

Strategies used by early interventionist with children who are birth-three with hearing loss were analyzed. The early interventionist worked with families of children with cochlear implants and other assistive devices.

### **ADOLESCENT EMOTIONAL DISCLOSURE TO DIFFERENT TARGETS: THE ROLE OF ATTACHMENT**

Primary Group Member: DeHaan, Samantha  
Student Class, Department: Graduate, Psychology  
Group Member(s): Lynda Kasky-Hernández, Graduate, Psychology  
Mentor(s): Prof. Jeffrey Kahn  
Author(s): Samantha DeHaan, Lynda Kasky-Hernández

Emotion regulation is an important skill to acquire throughout development due to the potential negative impact of over-regulation and under-regulation of emotions (Mullin & Hinshaw, 2007). The relation between an individual's experience and disclosure of a negative emotion has been associated with levels of distress, psychological and physiological symptoms, and interpersonal relationships (Garrison & Kahn, 2010; Kahn et al., 2012; Kennedy-Moore & Watson, 2001). During adolescence, the targets of emotional disclosure often change between parents, peers, and romantic partners. This particular area has not yet been researched (Papini et al., 1990). Thus, one purpose of this study was to examine the relation between the emotions that adolescents experience and the disclosure of these emotions to different targets (i.e., mother, father, best friend, and romantic partner).

Attachment in adolescence can be characterized along two dimensions: attachment avoidance and attachment anxiety (Brennen et al., 1998). The corresponding emotion-regulation strategies suggest that each of these attachment dimensions would be associated with lower correspondence between the experience and disclosure of emotion (Mikulincer et al., 2003). Thus, the second purpose of this study was to examine whether attachment is a moderator of the relation between adolescents' emotion experience and emotional disclosure to the four targets mentioned above.

Students who met the criteria for the study (i.e., first-year college freshmen) received an email from the university requesting them to participate in a survey. Students who agreed to



participate were given a link to a web-based questionnaire. 70 college freshmen completed the Emotional Self-Disclosure Scale (ESDS; Snell et al., 1988), and the Experiences in Close Relationships-Relationship Structures Questionnaire (ECR-RS; Fraley et al., 2011). Participants also rated how much they experienced each of the 40 emotions measured in the ESDS during the past week.

We examined the correspondence between emotion experience and emotional disclosure to the four targets. The greatest correspondence overall was for partners, followed by friends, mother, and then father. Additionally, emotion experience was positively related to disclosure within-person, indicating that when a given adolescent has a strong emotional experience he or she is likely to disclose that emotion to others. We also examined whether attachment moderates the within-person experience-disclosure relation. Attachment did not affect adolescents' willingness to disclose information regarding an emotional experience to the four targets. However, attachment avoidance did have a predictive effect on emotional disclosure, indicating that when adolescents are high in attachment avoidance they are less likely to disclose emotional experiences.

## **SELF EXPANSION IN RELATIONSHIP INITIATION**

Primary Group Member: Drozd, Jennifer

Student Class, Department: Undergraduate, Psychology

Group Member(s): Aleksandra Matysek, Psychology, Undergraduate

Mentor(s): Prof. Corinne Zimmerman

Author(s):

Self-expansion, the motivation for people to learn, explore, and grow, is facilitated by novel and challenging activities; often with close others (Aron & Aron, 1986). The process of relationship initiation itself is a novel experience, and highly desirable to many individuals. Self-expansion is common in all types of relationships and may play a crucial role in relationship initiation. The self-expansion process is important for relationship formation. The current study focused on the role of self-expansion in the relationship initiation phase. In particular, we are interested in continuing to investigate the ways in which a individual's self-expansion motivation and the types of self-expansion opportunity that a target may offer influence whether and how much that individual likes the target. In previous research, the opportunity for self-expansion was described with very general language. For example, a potential dating partner may have been described in a way that the relationship would be either "familiar and comfortable" or "new and challenging." In our study, we tailor the opportunity for self-expansion with the use of an online social networking profile (similar to Facebook). In a pre-screening survey, we ask participants to indicate their own preferred Interests, Activities, Sports, and Music. From this list, we generate a profile tailored for the participant in which the potential romantic target has the same or similar interests and activities (representing low opportunity for self expansion) or different interests and activities (high opportunity for self-expansion). Participants are college-aged adults, who are not in a current romantic relationship. A second purpose was to examine the relationship between various measures of self-expansion motivation and interest in initiating a relationship with an individual who offers high or low opportunities for self-expansion.

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

Primary Group Member: Ellsworth, McKayla

Student Class, Department: Graduate, Communication Sciences and Disorders

Group Member(s): Christine Zinn, Communication Sciences and Disorders, Graduate  
Marie Adelman, Communication Sciences and Disorders, Undergraduate  
Lindsay Bianchi, Communication Sciences and Disorders, Undergraduate  
Kathleen Brandt, Communication Sciences and Disorders, Undergraduate  
Stephanie Colletti, Communication Sciences and Disorders, Undergraduate  
Kelsey Johnson, Communication Sciences and Disorders, Undergraduate  
Kelsey Kistenfeger, Communication Sciences and Disorders, Undergraduate  
Lexie Millburg, Communication Sciences and Disorders, Undergraduate  
Nicole Pacente, Communication Sciences and Disorders, Undergraduate

Mentor(s): Prof. Heidi Harbers

Author(s): Sarah Reece, Sarah Hoyt, Adrian Fait, Kelsey Rosenorn,  
Natalie Bunton, Gina Duke, Shannon Jessen

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) and keep that information in their working memory in order to translate what they hear into symbols. 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 of an ongoing study (preliminary findings from 21 participants were presented last year). It presents the data pertaining to the phonological awareness and memory skills of more than 100 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?

## **ECONOMIC FEASIBILITY OF ILLINOIS STATE UNIVERSITY OUTDOOR LIGHTING LED RETROFIT**

Primary Group Member: Ficek, Austin

Student Class, Department: Undergraduate, Technology

Group Member(s): Andrew Siwicki, Technology, Undergraduate  
Dylan Peterson, Technology, Undergraduate

Mentor(s): Prof. Jin Jo

Author(s):

Currently Illinois State University's (ISU) campus is utilizing conventional lighting technology to illuminate its parking lots and walkways. In addition to the unpredictability of electricity rates and stricter environmental regulations, the demand for cheap and effective lighting alternatives is increasing, resulting in high efficiency light emitting diodes (LEDs) to become an option to save money and reduce emissions. The purpose of this research project is to perform an economic feasibility study on ISU campus in order to provide different options to retrofit current lighting to LEDs, and to determine if there are any suitable locations where new LED poles with built on photovoltaic (PV) panels can be placed. The locations being analyzed are all walkways and parking lot lighting around the campus of ISU. Information on current lighting fixtures and bulbs were obtained, such as, power rating, hours of operations, and locations. Information on different LED retrofit alternatives as well as options and locations for new poles with a PV system were examined as well. The SunEye device was utilized to determine solar access in potential areas for new poles with PV panels. Case studies supplemented the research we conducted, and past studies show that LED lighting is a very effective option to cut electrical costs, therefore, with the amount of lighting around campus, retrofitting to LEDs seems to be a viable option for ISU. Here we report the outcomes of our study which include payback periods, cost estimations and recommendations for different available retrofit options, and potential locations for new LED light poles with PV panel.

## **UNPACKING THE POSITIVE ILLUSORY BIAS IN BOYS WITH ADHD**

Primary Group Member: Fladhammer, Alexandria

Student Class, Department: Graduate, Psychology

Group Member(s): Leah Cohen, Psychology, Graduate

Mentor(s): Prof. Steven Landau

Author(s): Alexandria Fladhammer, Marla Ronk, Alycia Hund, Steven Landau

This study will examine the positive illusory bias among boys with ADHD. We predict that boys with ADHD who are about to join a game will describe themselves as more competent than those without ADHD. We also predict that this effect will become more pronounced in their second attempt, as unfamiliar boys become familiar playmates. Attendees will develop a better understanding of the social-cognitive functioning of children with ADHD.

## **MATHIEU SUBSPACES OF RINGS OF 2x2 MATRICES OVER CERTAIN FINITE RINGS**

Primary Group Member: Fry, Hanna

Student Class, Department: Undergraduate, Mathematics

Group Member(s): Rebecca Feld, Mathematics, undergraduate  
Katie Ruben, Mathematics, undergraduate  
Jenna Simpson, Mathematics, undergraduate  
Paige Kilgus, Mathematics, undergraduate

Mentor(s): Prof. Wenhua Zhao

Author(s):

The notion of Mathieu subspaces, as a natural generalization of ideals, has been introduced by Wenhua Zhao (a professor at ISU) in 2009. This new notion plays fundamental roles in many different areas of mathematics. In this presentation we discuss some properties and classifications of Mathieu Subspaces for the rings of 2x2 matrices over certain finite rings.

## **MUTUAL DEVIANCE: LIKING INDIVIDUALS WITH SIMILAR UNFAVORABLE OPINIONS WITHIN GROUPS**

Primary Group Member: Hogue, John

Student Class, Department: Graduate, Music

Group Member(s): Fredrick Eichler, Psychology, Graduate  
Devin Gill, Psychology, Graduate

Mentor(s): Profs. Eric Wesselmann, John Pryor

Author(s): John Hogue, Fredrick Eichler, Devin Gill, Eric Wesselmann,  
Kipling Wiliam, John Pryor

We revisited Schachter's (1951) groundbreaking deviate-rejection study because nearly 54 years have passed since the last attempted replication (Emerson, 1959). We assessed if Schachter's finding that a deviate group member is rejected replicated in our current study. We extended his research by examine how an individual's attitude similarity to the deviate predicted liking toward that member; Schachter's original study did not investigate how individual members' own attitudes differentially predicted evaluations of the deviate. Seventeen groups consisting of 6-10 individuals (including three confederates: a deviate, a slider, and a mode) discussed a juvenile delinquent case study for 45 min. Participants expressed their opinion about what should be done with the delinquent using a 7-point rating scale. Participants publicly reported their opinion at the beginning, middle, and end of the discussion. In each discussion, we randomly assigned the three confederates to a different role. The "deviate" maintained a seven rating throughout the discussion (always the opposite side of the overall group position). The "mode" maintained the modal group position, and the "slider" began the discussion at seven and then gradually conformed to the modal group position. At the end of the discussion participants recommended committee assignments for each member, and voted for who they wanted in potential future group meetings, and used a 7-point rating scale to indicate how much they liked each member.

We partially replicated Schachter's original findings that a deviate is likely to be rejected. We used within-subjects regression (Judd et al., 2001) and found participants liked the deviate more if their own opinions were closer to the deviate's opinion. Participants' opinions did not predict liking for either the mode or slider. Our data offer support for Schachter's original findings and also suggest nuances that Schachter may have missed in his original treatment of his data. We suggest potential moderators for future research to consider.

## **SECOND STEP CURRICULUM EDITION AND CHILDREN'S SOCIAL-EMOTIONAL BEHAVIOR**

Primary Group Member: Honer, Jennifer

Student Class, Department: Undergraduate, Psychology

Group Member(s): Ryland Gallagher, Psychology, Undergraduate

Mentor(s): Prof. Renée M. Tobin

Author(s): Ryland Gallagher, Jennifer Honer, Alyssa Sondalle

Given the importance of social and emotional learning (SEL) on many aspects of student functioning, determining the extent to which SEL curriculum exposure influences children's specific social and emotional outcomes is important. The present study investigates the effectiveness of two different editions of Second Step: A Violence Prevention Curriculum (Second Step; Committee for Children, 2002, 2011) curriculum, namely the third and fourth edition. Second Step is a widely used, nationally recognized SEL program identified as an evidence-based intervention for decreasing problem behaviors and increasing prosocial behaviors such as cooperation, problem solving, coping behaviors (Frey, Nolen, Edstrom, & Hirschstein, 2005; Grossman et al., 1997; McMahon, Washburn, Felix, & Childrey, 2000; Taub, 2002). The third edition of the preschool/kindergarten Second Step curriculum offers 25 weekly lessons teaching empathy, emotion management, and problem solving. Similarly, the fourth edition of the kindergarten curriculum offers 25 weekly lessons targeting the same goals, but it also includes updated picture cards and songs, and an entire new unit devoted to teaching self-regulation skills directly. The main objectives were to examine whether children's various social and emotional outcomes, as measured by report cards and teacher ratings, were related to the specific edition of the curriculum they received. We predicted that children who received the fourth edition of the curriculum would demonstrate better social-emotional outcomes than their peers receiving the third edition of the curriculum. Implications of these findings will be discussed.

## **SOLAR PHOTOVOLTAIC (PV) EDUCATION FOR CENTRAL ILLINOIS SCHOOLS - A FIELD STUDY**

Primary Group Member: Hysell, Michael

Student Class, Department: Undergraduate, Technology

Group Member(s): Jeff Block, Technology, Undergraduate  
Corey Browning, Technology, Undergraduate  
Kyle Goldman, Technology, Undergraduate

Mentor(s): Prof. Jin Jo

Author(s):

There is a shift occurring from a fossil fuel powered world to one powered with renewable energy. As reliance on renewable sources of energy increases there will also be an increased need for education about the growing renewable energy powered world. To meet this demand schools should have the proper tools and programs available to be able to teach the future generations about renewable energy. The Illinois Solar Schools grant provides this opportunity to schools that want to educate their students about solar energy. The purpose of this research was to evaluate schools from the central Illinois area that do not yet have solar power educational tools or programs. During this evaluation it was determined what difficulties the schools may face when applying for and receiving the Illinois Solar Schools grant. This grant provides funding to build a small scale solar PV system as an educational tool. Through on site solar shade analysis using Solmetric SunEye and simulation models using SAM (System Advisor Model) a solar PV system has been created that conforms to the requirements of the Illinois Solar School grant. Through our research we have evaluated the difficulties these schools faced when receiving the grant and provide a source of information for any interested schools wishing to pursue the Illinois Solar Schools grant. This is a great opportunity to begin teaching students about solar power and the benefits it provides. It will greatly benefit not only the students and staff of the schools receiving the Illinois Solar Schools grant but also the community by bringing attention to the growing renewable field in the area and the renewable energy field collectively by increasing the number of educated minds that are passionate about embracing renewable energy.

## **SPONTANEOUS IMITATION AND EXPRESSIVE LANGUAGE DEVELOPMENT IN AUTISM SPECTRUM DISORDERS**

Primary Group Member: Jacobsen, Ryan

Student Class, Department: Undergraduate, Psychology

Group Member(s): Mia Hobson, Psychology, Undergraduate  
Haley Martin, Psychology, Undergraduate  
Taylor Beninato, Psychology, Undergraduate  
Kristina Turek, Psychology, Undergraduate

Mentor(s): Prof. Karla Doepke

Author(s): Ryan Jacobsen, Taylor Beninato, Mia Hobson, Haley Martin,  
Kristina Turek

Imitation is generally defined as a means by which individuals copy another person's behavior, emulating both the physical properties and connotation of the behavior. The purpose of imitation is twofold: first, it is a mechanism for the children to learn; and second, it is a way for

children to interact socially with others (Ingersoll, 2008). While children who are typically developing naturally imitate, children with autism often do not. Given that imitation is a pivotal skill and a precursor to social interaction, expressive language and pretend play, it is important to develop effective interventions to teach children with autism to imitate. This research examines the effectiveness of child-directed and teacher-directed imitation training on spontaneous imitation and expressive language skills of children with autism spectrum disorders (ASD). Specifically, utilizing a multiple-baseline design, two imitation training procedures will be compared to determine the relative efficacy of each in improving spontaneous imitation and language. It is hypothesized that while an initial phase of teacher-directed imitation training would produce an increase in imitation ability, the subsequent introduction of child-directed imitation training would result in a significantly greater gain spontaneous imitation. Results will be discussed in terms of effectiveness of each training mode in improving spontaneous imitation as well as tracking changes in expressive language skills.

### **INVESTIGATION OF OXIDOPYRILIUM-ALKENE [5+2] CYCLOADDITION CONJUGATE ADDITION CASCADE (C3) SEQUENCES**

Primary Group Member: Law, Chunyin

Student Class, Department: Graduate, Chemistry

Group Member(s): Justin Simanis, Chemistry, Graduate

Mentor(s): Prof. Timothy Mitchell

Author(s): Chunyin Law, Justin Simanis, Erica Woodall, John Goodell, Timothy Mitchell

Bridged polycyclic ethers produced as a result of oxidopyrylium [5+2] cycloaddition are found in a variety of diverse biologically active natural products. By investigating these systems we hope to contribute to oxidopyrylium-alkene [5+2] cycloadditions reaching their full potential as a synthetic tool. In previous work, we have shown that a significant difference exists in the rate in which anti- and syn-diastereomers of acetoxypyranones undergo [5+2] cycloaddition. In the course of this investigation we have reported a unique [5+2] cycloaddition - conjugate addition cascade sequence which provides an effective route towards bridged, tetracyclic ether scaffold which consists of four rings and six chiral centers with defined stereochemistry. Herein, we discuss the limitations and scope of the cascade sequence.

### **IMMEDIATE AND LONG TERM EFFECTS OF PROPHYLACTIC ANKLE SUPPORT ON ANKLE AND KNEE KINEMATICS DURING COUNTER MOVEMENT JUMPS**

Primary Group Member: Mathew, Philip

Student Class, Department: Graduate, Kinesiology and Recreation

Group Member(s): Kyle Sanderson, Kinesiology and Recreation, Undergraduate

Mentor(s): Prof. Michael Torry

Author(s): Philip Mathew, Kyle Sanderson, Jacque Jones, Anthony Guither-Humble, Michael Torry

**INTRODUCTION:** Prophylactic ankle supports are applied to decrease probability of ankle injuries. A criticism of these supports is that they may decrease ankle range of motion (ROM), thereby hindering performance during dynamic movements.

**PURPOSE:** To determine if a prophylactic ankle support alters ankle and/or knee ROM during maximal vertical counter movement jumps.

**METHODS:** Five males (21±1 yrs; 78.5±9.8 Kg; 1.79±0.1 m) performed five maximal effort vertical countermovement jumps with and without wearing an off the shelf ankle support. Three data sets were collected: 1) initial testing without ankle support (control), 2) immediately after support application; and, 3) after four weeks of consistent support wear. Subjects were instructed to wear the device for all physical activity and for a minimum of 5 hours per day over the four week period.

Support wear compliance was assessed via daily log and random log inspection. Ankle and knee plane kinematics were measured with a 10-camera (200 Hz) mocap system capturing a full body (39 markers), three-marker/segment anthropometric model. 3D coordinate data were tracked, filtered (10 Hz), and processed utilizing Vicon Plug-In-Gait to yield local minima and maxima ankle and knee angles in the sagittal and frontal planes. Jump height was considered the main performance indicator and was calculated via vertical-displacement [from anatomical position height to maximal vertical position during the jump] of a reflective marker located on the manubrium. Differences between conditions were examined utilizing a RMANOVA ( $\alpha=0.05$ ).

**RESULTS:** Control frontal plane ankle ROM was 4.98±1.0° prior to brace application and was 4.74±1.1° post initial application ( $p = 0.88$ ). No differences were observed in the sagittal plane at the ankle, or in the frontal/sagittal plane at knee ROM (all  $p > 0.24$ ). The impact on jump performance was non-significant ( $p > 0.31$ ).

**CONCLUSIONS:** ROM and jump height performance were not affected by immediate or long term use of prophylactic ankle support.

## **LITERACY DEVELOPMENT AMONG ENGLISH LANGUAGE LEARNERS IN HEADSTART PRESCHOOL SETTINGS**

Primary Group Member: McKinley, Jessica

Student Class, Department: Graduate, Psychology

Group Member(s): Amanda Mangian, Psychology, Graduate

Mentor(s): Prof. Adena Meyers

Author(s): Jessica McKinley, Amanda Mangian, Adena Meyers, Kathy Hoff

The current study examines the impact of preschool on the development of English language literacy skills of English language learners (ELLs) when compared to their native English-speaking peers. Each student was administered a battery of assessments by a trained graduate student, measuring school-readiness and English literacy skills. Session attendees will gain knowledge about the impact of early intervention on literacy development for ELLs compared to native English speakers in diverse preschool settings.

## **DEVELOP A METHODOLOGICAL FRAMEWORK FOR SELECTING OPTIMUM CARBON OFFSETTING STRATEGIES FOR ILLINOIS STATE UNIVERSITY**

Primary Group Member: Miller, Paul

Student Class, Department: Undergraduate, Technology

Group Member(s): Steven Ripp, Technology, Undergraduate

Mentor(s): Prof. Jin Jo

Author(s):



Recent anthropogenic activity has caused the release of large amounts of greenhouse gases into Earth's atmosphere causing the climate to change drastically. Illinois State University could be compared to a small city, and as such a large institution we must take it upon ourselves to analyze the current emissions and energy consumption used by the entire Illinois State University community and set in place plans to mitigate some of these causes. Forming a Climate Action Plan (CAP) will address these issues including others that can help define what the university needs to do to reduce their energy consumption and greenhouse gas emissions. Once the university has a CAP in place the faculty and students will be able to follow suit and begin to take note of the universities steps and concentrate on applying them to their own lives. We plan on analyzing a number of CAP's from universities around the country and classifying them based on population size, climate region, and heating degree days. After the CAP's have been sorted into categories we will begin to analyze what mitigation strategies the different universities invested in and how effective the strategies were. With all of this compiled knowledge, we will form a framework that can calculate the best greenhouse gas mitigation strategies based on where you are located in the United States. Using our own framework, we will construct a CAP proposal for Illinois State University to potentially put in place. This project will be conducted in three steps. First, the different CAP's will be reviewed and categorized. Next, the framework for ranking the greenhouse gas mitigation strategies will be formulated. Finally, a CAP proposal will be formed, using our own framework, for Illinois State University. This project is important because the framework that we will form will not only benefit Illinois State University, but also anyone in the continental United States that wish's to formulate a CAP of their own.

## **THE PSYCHOLOGICAL EFFECT OF CULTIC BELIEFS ABOUT MUSIC**

Presenter:	Miner, Kristiana
Student Class, Department	Graduate, Music
Group Member(s):	JD Hogue, Graduate
Mentor(s):	Prof. Andrea Crimmins
Author(s):	Kristiana Miner, JD Hogue, Andrea Crimmins

This study explored the self-reported effects of music beliefs taught within a cult. We analyzed Bill Gothard's music-related teachings within his organizations, including the Institute in Basic Life Principles (IBLP). Literature published by IBLP and Gothard indicates that music is not amoral and that only certain types of music are acceptable. We conducted a survey with 196 participants (93% Caucasian, 69% female, 31% male, Average Age = 32) who indicated being former members of one or more of Gothard's organizations. The majority of participants stated that they agreed with Gothard's teachings on music in the past but currently disagree with them now, and that most currently consider Gothard's teachings to be a significant negative influence. The strength of this negative influence depended on currently believing in Gothard's teachings and their agreement with his teaching that only certain types of music are acceptable. Participants who currently disagreed on Gothard's teachings reported that their negative effects increased as they indicated being taught that only certain types of music was acceptable. People who currently believe Gothard's teachings also increased the strength of the negative effects as they changed from disagreeing with acceptable music choices to agreeing. Their rating of negative effects was stronger than those who currently disagreed the teachings when they disagreed with acceptable music choices but were weaker when they agreed with the acceptable music choice teachings. Considering the unique viewpoint represented by this

population, music therapists must take their clients' personal histories and current beliefs into account when choosing music for sessions, as clients who may have strong negative emotional responses to certain genres of music may respond negatively. It is in the clinician's and client's best interest for the professional to be as knowledgeable of the client's background when dealing with populations such as this one.

## **TRANSITION PROGRAM FOR ADULTS WITH AUTISM**

Primary Group Member: Mulderink, Thomas  
Student Class, Department: Graduate, Psychology  
Group Member(s): Jennifer Mays, Psychology, Graduate  
Mentor(s): Prof. Karla Doepke  
Author(s): Jennifer Mays, Thomas Mulderink, Karla Doepke

Three young adult participants completed the adult training program at The Autism Place focused on developing relevant social and functional skills necessary for most professional settings such as basic customer service skills, answering business calls, conducting inventory, and reducing inappropriate behaviors. Additionally, participants were also trained in basic maintenance and store up-keep skills. Targeted skills related to up-keep focused on overall cleaning (e.g., cleaning windows, taking out garbage) and organization (e.g., stocking shelves, taking inventory). Skills were developed through the use of behavioral principles as well as self-monitoring strategies.

Participants ranged in age from 16 to 25 years, and were all males. The program was a six-week job-training and social skills training program (three hours per day, four days per week). Skills were generally taught in a group setting, with individualized instruction provided as needed. The skills were practiced in the context of providing routine maintenance at a local service agency and operating a small store. A graduate student who has experience working with individuals with ASD functioned as a manager of the store. In addition, the graduate student and a trained undergraduate student monitored the progress of the participants by collecting detailed data on the participants' job completion performance as well as their accuracy in monitoring their own performance. At the beginning of the program, the participants completed pre- and post-test assessments using the TEACCH Transition Assessment Profile – Second Edition (TTAP-II; Mesibov, Thomas, Chapman, & Schopler, 2007) to compare behavioral changes following the completion of the vocational skills training program. Additionally, individualized progress that each participant made toward individual training goals was evaluated via single-subject data analysis methodology to track participant progress over time.

Results focused on a single participant within the program "Andrew". Andrew's data focused on business call completion, quality of customer interaction, frequency of clinician and peer directed aggression, as well as group goals focusing on inventory and cleaning tasks. All areas demonstrated moderate to considerable improvement over time and relative to baseline when appropriate.

## **THE EFFECTS OF ONE HUNDRED PERCENT NATVIA AND WHEY-LOW SUBSTITUTION IN A FROZEN HOT CHOCOLATE BEVERAGE**

Primary Group Member: Nemec, Kelly

Student Class, Department: Undergraduate, Family and Consumer Sciences

Group Member(s): Jordan Ingold, Family and Consumer Sciences, Undergraduate  
Rebecca Edwin, Family and Consumer Sciences, Undergraduate  
Rebecca Copeland, Family and Consumer Sciences, Undergraduate

Mentor(s): Prof. Julie Schumacher

Author(s): Kelly Nemec

The substitution of sugar substitute ingredients in a frozen hot chocolate beverage experiment measured the taste, mouthfeel, overall acceptability, hardness, melting time, and nutrient content of three different frozen hot chocolate recipes. One recipe was the control recipe, the second recipe utilized the sugar substitute called Natvia instead of white granulated sugar and brown sugar, and the third recipe contained the sugar substitute Whey-Low instead of white granulated sugar and brown sugar. The sensory testing of each variation measured the taste, mouthfeel, and acceptability. The objective testing measured the hardness and melting time of each variation. The nutrients analysis of each variation analyzed the total calories, total fat, protein, and sugar. As a result of the experiment, the Natvia variation rated significantly lower in taste, mouthfeel, and overall acceptability. The Control had the highest measurement for hardness and had the longest melting time. Whey-Low resulted with the highest overall acceptability and mouthfeel. The nutrient analysis determined the low sugar values for the Natvia and Whey-Low variations. The results from the study revealed sensory, objective, and nutritive evaluations on a control frozen hot chocolate beverage recipe and two variations using Natvia and Whey-Low as sugar substitutes.

## **IMPLEMENTATION OF DISTRIBUTED GENERATION TECHNOLOGIES IN THE AUTOMOTIVE INDUSTRY**

Primary Group Member: Nemeth, Michael

Student Class, Department: Undergraduate, Technology

Group Member(s): Alex McCarty, Technology, Undergraduate  
Jake Dauck, Technology, Undergraduate  
Bryan Vest, Technology, Undergraduate

Mentor(s): Prof. Jin Jo

Author(s):

The automotive industry is currently one of the largest consumers of energy in the United States and the world economy. Unfortunately, this also means this industry as a whole emits large amounts of greenhouse gases into the atmosphere. To actively cope with these sustainability impacts, some of the current automotive manufacturing facilities are researching and implementing new technological designs to reduce the amount of energy they consume while also reducing the amount of greenhouse gases being emitted into the atmosphere. One automotive manufacturing plant that is trying to do this is located in Central Illinois, therefore, throughout this study this particular manufacturing facility will be the location of this study. The

plant's current goal is to reduce the amount of CO2 emissions released into the atmosphere by 30% by the year 2021. Therefore, in this research project we examined the possibility of implementing solar photovoltaic (PV) distributed generation to both reduce the amount of energy demanded from the grid and to reduce negative environmental externalities. System Advisor Model (SAM), a tool designed to model performance and cost of solar projects, was utilized to compare the plant's current energy usage and determine the best configuration of solar arrays to offset their energy costs and help them reach the plant's goal by the year 2021. We also used Google Sketch-up, a spatial modeling program, was also used to give a visual representation of the best location for the proposed distributed solar PV system in order to utilize the solar radiation to its fullest potential. We also looked into local, state, and national incentives for implementing solar photovoltaic systems to ease the financial burden of construction. This is integral in making the project implementation economically feasible.

### **THE INFLUENCE OF TWO EDITIONS OF A PRIMARY PREVENTION PROGRAM ON KINDERGARTNERS' SOCIAL-EMOTIONAL OUTCOMES**

Primary Group Member: Probst, Katelyn

Student Class, Department: Graduate, Psychology

Group Member(s): Christina Carreno, Psychology, Graduate  
Alyssa Sondalle, Psychology, Graduate

Mentor(s): Prof. Renée M. Tobin

Author(s): Christina Carreno, Katelyn Probst, Alyssa Sondalle, Renée Tobin

This study compared the social-emotional outcomes of children who received two different editions of Second Step: A Violence Prevention Curriculum. Classrooms were randomly assigned to receive 25 standard lessons of the third or fourth edition of the curriculum. Preliminary results will be discussed in terms of children's social-emotional development.

### **ISU TOGO CONTAINER COMPOST STUDY**

Primary Group Member: Qureshi, Enas

Student Class, Department: Undergraduate, Health Sciences

Group Member(s): Rebekah Abangan, Health Science, Undergraduate  
Jennifer Kamm, Health Sciences, Undergraduate

Mentor(s): Prof. Thomas Bierma

Author(s):

In fall of 2013, Illinois State University's Campus Dining Services switched over to a more environmentally friendly option for carryout containers. Originally, we were using Styrofoam boxes, which do not decompose well. The ones we now use are made of sugar cane fiber, which are more biodegradable. However, these carryout containers are still disposed of in the landfill. Professor Thomas Bierma and ten Environmental Health students performed a research study to determine if the containers could be composted at the ISU farm. We needed to find out how many people would participate by throwing their containers in our designated collection bins, how well the containers ground up into compost, what the rate of contamination was, what items contaminated the containers, and how we would organize the labor force to collect and transport the containers. During the week of November 9th to November 14th, the group collected a total of 1,548 carryout containers from Haynie, Wilkins, and Wright Residence Halls;

this proved the rate of participation was fairly high, as we were expecting at most 1,000 containers. The containers ground up nearly completely with the rest of the compost at the farm. The rate of contamination was high at 1,732 items, or 1.22 items per container. The main items of contamination were plastic forks, plastic spoons, plastic knives, napkins, other smaller paper containers, paper cups and plastic lids, and some silverware. Very direct signs and education would be needed to completely eliminate contamination from the containers. The question of organized labor was most difficult to answer since we did all of the work voluntarily. Now that we know that the containers composted very well, the next step is to organize the logistics and direct students to remove contamination completely.

## **EMERGING ADULTS AND THEIR PARENTS: AUTONOMY AND PARENTING STYLES**

Primary Group Member: Risten, Leann

Student Class, Department: Undergraduate, Psychology

Group Member(s): Brianne Madden, Psychology, Undergraduate  
Julie Kerstein, Psychology, Graduate  
Lauren Hutmacher, Psychology, Undergraduate  
Katie Cunningham, Psychology, Undergraduate

Mentor(s): Prof. Patricia Jarvis

Author(s):

Emerging adulthood is a newer developmental stage in which young adults navigate into the world of adulthood to achieve autonomy (Arnett, 2000; 2007). Parents play a pivotal role in supporting their adult child as they achieve autonomy. While many researchers have considered parenting (e.g., Belsky, 1984, Baumrind, 1971), few scholars have examined parenting variables with regard to emerging adults. Our research utilized a mixed methods design in which both qualitative and quantitative data were collected.

College students and their parents completed published measures of the study constructs. Only emerging adult data are reported herein as coding of parent data is ongoing. Measures included standard background information, an assessment of emotional autonomy (Steinberg & Silverberg, 1986), parenting style (Acceptance and Demandingness; Lamborn, Mounts, & Steinberg, 1991), coping strategies (Carver, 1997), parent depressive symptoms (CES-D; Radloff, 1977), and emerging adult drug and alcohol use (Greenberger et al., 1981). We expected that parental variables would predict college student adjustment with coping serving as a moderator between parental stressors and adjustment variables.

Preliminary correlational analyses of emerging adult data only ( $n = 490$ ) indicated that students who indicated their parents utilized the accepting parenting style correlated with greater individuation, nondependency, and parent deidealization ( $r = .425$ ,  $p = .0001$ ,  $r = .420$ ,  $p = .0001$  and  $r = .533$ ,  $p = .0001$  respectively). In addition, students who indicated their parents were more demanding positively correlated at a lower level with individuation, parent deidealization and nondependency ( $r = .239$ ,  $p = .0001$ ,  $r = .218$ ,  $p = .001$  and  $r = .238$ ,  $p = .001$ ). Moderated regressions are being computed to test specific assertions regarding the study variables as well. Parent data and qualitative responses to open ended questions about the adult child-parent relationship are also being investigated.

Our college student sample demonstrated emerging autonomy with regard to their relationship with their parents but may not be fully autonomous when their parent is more demanding. Our results provide data regarding emerging adult adjustment as related to parenting. In addition, the link between parenting style in terms of demandingness versus acceptance indicates that emerging adults with stricter parents leads to slower development in autonomy and realistic perceptions of their parents.

### **A GIS APPROACH, CONSIDERING THE SOCIAL AND ECONOMIC IMPACTS OF IMPLEMENTING A DISTRIBUTED GENERATION PLAN IN THE TOWN OF NORMAL**

Primary Group Member: Rose, Zachary

Student Class, Department: Undergraduate, Technology

Group Member(s): Evan Deabel, Technology, Undergraduate  
Andrew Verderber, Technology, Undergraduate

Mentor(s): Profs. Jin Jo, Jamie Cross

Author(s): Jin Jo, Zachary Rose, Evan Deabel, Andrew Verderber

Normal Illinois electric power infrastructure currently in place failed to account for distributed generation (DG) from small modular sources, such as solar photovoltaic (PV) technology. Although quality assurance and increased reliability incentivize DG, determining the feasibility of implementation requires a thorough analysis and deployment of new methodologies. The unique methodology of this report provides the Town of Normal with an opportunity to invest in their energy future and economic stability by assessing the feasibility and impact of implementing a DG plan. Results of this report were generated through the utilization of advanced Geographic Information System (GIS) and System Advisor Model (SAM), in conjunction with social and economic variables. Community leaders progressive decisions to incorporate sustainability into the Town's strategic plan has prompted conditions favorable to a project of this scope. The proposed method was broken down into two phases; (1) shows the potential benefits of integrating a DG system into the existing electrical infrastructure by accounting for social and economic variables influencing project implementation, and (2) provides an intricate assessment of the Town of Normal's solar irradiance determining average array offset per home.

### **SHERMAN'S RESEARCH CLIENT PROJECT**

Primary Group Member: Sanchez, Lucy

Student Class, Department: Undergraduate, Marketing

Group Member(s): Katherine Trevino, Marketing, Undergraduate

Mentor(s): Prof. Steven Taylor

Author(s): Lucy Sanchez, Katherine Trevino

The following report details a study undertaken during the Summer 2013 designed to help inform the efforts of Dr. Taylor's Fall 2013 MKT 430 class. The three main areas of information this research will focus on are the sources of information and the process of information management about the retail consumption process of choosing major appliances and/or mattresses, and mapping the goal hierarchy of retailer selection in these product categories. During the summer of 2013 we conducted two focus groups for Sherman's, as agreed upon

between Mr. Sherman and Dr. Taylor. The purpose for this research was to find out what the decision making process is for female consumers when purchasing major appliances and mattress. We also wanted to find out what positioning Sherman's holds in the market. A mailing list was purchased from the Bloomington-Normal area to select candidates. Letters were mailed requesting assistance with the research project, with a guaranteed \$75 once the focus group was over. The consumers chosen for this research project were married, female homeowners between the ages of 20 and 90. The participants were split into two focus groups and were questioned on their preferred sources of information and the decision making process about major appliances and/or mattresses and retailers of major appliances and/or mattresses. We had a total of twenty three respondents, thirteen for appliance and ten for mattresses. After the focus groups were completed we took several steps to make sense out of the information that was gathered. To start we organized the data from the questionnaire in an excel spreadsheet. We used the spreadsheets to create graphs that made the data easy to understand. From the graphs we were able understand the decision making process for consumers when making a major appliance or mattress purchase. During the focus group we had participants group retailers from first to last choice. From this we were able to compare retailer positioning and similarities in the market as seen by consumers. For the last step we proceeded to create goal maps, using the attribute-laddering method, which highlighted the important attributes about the decision making process and what consumers found to be important to them.

#### **DETERMINING THE PARAMETERS OF A GENE SILENCING MECHANISM IN THE MODEL ORGANISM NEUROSPORA CRASSA**

Primary Group Member: Sauls, Pegan

Student Class, Department: Graduate, Biological Sciences

Group Member(s): Zach Smith, Biological Sciences, Undergraduate

Mentor(s): Prof. Thomas Hammond

Author(s): Pegan Sauls, Zach Smith, Kevin Sharp, Thomas Hammond

When model organism *Neurospora crassa*'s cells undergo meiosis, its genome undergoes a gene silencing mechanism referred to as MSUD (Meiotic Silencing of Unpaired DNA). MSUD can be triggered during homologous chromosome pairing if any gene "looks" unpaired. This has been shown to occur when a gene is deleted or when an extra ectopic copy is added to one of the chromosomes. In our research we have taken a gene marker and integrated it at different spots into the *N. crassa* genome. After performing multiple crosses between strains containing the differently located gene marker, the progeny of those crosses were examined to determine spore phenotypes and the degree of silencing. We have discovered that the amount of gene silencing is dependent upon the distance between the gene markers on each homologous chromosome.

## **OUR TOWN: A NEIGHBORHOOD ASSESSMENT**

Primary Group Member: Sheets-Poling, Daniel

Student Class, Department: Graduate, Economics

Group Member(s): Rachelle Wilson, Politics and Government, Graduate  
Ramya Kumaran, Politics and Government, Graduate  
Matthew Tomlin, Politics and Government, Graduate  
Nay Petrucelli, Politics and Government, Graduate  
Katie Simpson, Politics and Government, Graduate  
Calvin LeSueur, Economics, Graduate  
Brett Michaelson, Economics, Graduate  
Christina Davila, Sociology, Graduate  
Katie Raynor, Sociology, Graduate

Mentor(s): Prof. Joan Brehm

Author(s):

This report addresses the question: What factors have the strongest impact on communal and individual well-being in different neighborhoods in McLean County? It is one part of the larger United Way of McLean County Community Assessment 2014, which will evaluate the assets and needs of McLean County by focusing on respondents' experiences receiving health and human services. Our findings are based on data from five key informant interviews and four focus groups. This information was collected from four geographically and economically distinct neighborhoods: rural Lexington, East Bloomington, Normal, and West Bloomington. Common themes that emerged from these sessions are: the dearth of opportunities for young people, the desire for more local businesses, praise for city services such as garbage collection, the desire for growth of community, and the importance of churches. A number of other findings, limitations of the assessment, and recommendations and future research are discussed.

## **ILLINOIS STATE UNIVERSITY SOLAR FEASIBILITY STUDY**

Primary Group Member: Tearney, Arkadius

Student Class, Department: Undergraduate, Technology

Group Member(s): Cody Baker, Technology, Undergraduate  
Chris Golwitzer, Technology, Undergraduate  
Tim Fudala, Technology, Undergraduate

Mentor(s): Prof. Jin Jo

Author(s):

The high demand for clean, domestic energy has created a need for new ways to utilize public space for electricity generation. In addition to this demand, Illinois State University should have a representation of its efforts and teachings of sustainability. The study proposed areas located on ISU's campus that would not only be a source of photovoltaic energy generation, but also serve as a visible educational tool for the University's sustainability initiative. The areas chosen were primarily based on the amount of visibility they could provide for either a solar façade or solar panels. The second criterion considered was based upon the amount of energy produced. Simulation tools helped aid the array development based upon the principles of energy efficiency, electricity production, and cost evaluation. Additionally, the development included



the tilt angle, inverter selection, panel selection and orientation, and a shading analysis of the site. Each array was compared and contrasted to make a suitable recommendation to Illinois State University.

### **INVESTIGATIONS OF ELECTRONICALLY AFFECTED DIENES IN DIELS-ALDER [4+2] CYCLOADDITIONS**

Primary Group Member: Thompson, Brendan  
Student Class, Department: Undergraduate, Chemistry  
Group Member(s): Christopher Olson, Chemistry, Undergraduate  
Mentor(s): Prof. T. Andrew Mitchell  
Author(s): Christopher Olson, Brendan Thompson

The Diels-Alder reaction is one of the most recognizable reactions in the field of organic chemistry. It hinges on the three factors of stereospecificity, stereoselectivity, and chemoselectivity. A large number of synthetic products rely on the intermolecular Diels-Alder. We have been successful in synthesizing an electronically deactivated, sterically hindered lactam diene. Although a successful Diels-Alder was reported with this lactam diene, further studies have demonstrated limitations in the reaction scope. We will continue to explore other dienes and their reactivity with the Diels-Alder, specifically lactone dienes. In the case of lactone dienes, we will explore electronic effects compared to the lactam diene.

### **THE OVERALL ACCEPTABILITY OF PUMPKIN BARS USING GROUND FLAXSEED OR SWEET POTATO BABY FOOD AS EGG REPLACERS**

Primary Group Member: Uhlman, Jennifer  
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Mentor(s): Prof. Julie Schumacher  
Author(s):

Three different pumpkin bar variations were analyzed to determine the effect of replacing eggs on batter viscosity, springiness, taste, mouthfeel, and overall acceptability. The goal of the research was to produce acceptable dessert products that could accommodate an individual with an egg allergy. The variations tested in the study consisted of a Control made with eggs, Variation 1 made with ground flaxseed, and Variation 2 made with sweet potato baby food. After the batters for the three variations were mixed, samples of 90mL were removed from each batter to test for batter viscosity using a Bostwick Consistometer. A 30mL sample was placed into the device and the distance the batter travelled was recorded at two and four minutes. Three trials were completed for each variation. After the pumpkin bars were baked, they were stored at room temperature until they were plated for sensory analysis. A total of thirty-nine participants completed a randomized taste test of the pumpkin bars and filled out a ballot rating the samples on a four point Likert scale for taste, mouthfeel, and overall acceptability. The data was compiled into SPSS and paired-sample t-test was completed for the three factors. It was found that there was no statistically significant difference between either variation or the Control. Variation 2 had the highest ratings for taste and acceptability, while the Control and

Variation 2 had equal ratings for mouthfeel. Springiness of the pumpkin bars was conducted using the Brookfield Texture Analyzer and it was found that the Control produced the springiest final product. It was concluded that acceptable pumpkin bars can be produced without the utilization of eggs, and that certain variations may even create products of greater acceptability to consumers.

## **A MODEL EXAMINING VOLUNTEER SATISFACTION, BURNOUT, CONSTRAINTS, AND TURNOVER INTENTION**

Primary Group Member: Whitely, Aaron

Student Class, Department: Graduate, Psychology

Group Member(s): Andy Eichler, Psychology, Graduate  
Anthony Czesak, Psychology, Graduate  
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Kamila Gabka, Psychology, Graduate  
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Mentor(s): Prof. Kimberly Schneider

Author(s): Aaron Whitely, Andy Eichler, Anthony Czesak, Kailey Perez,  
Kamila Gabka, Ashley McCarthy

The Bureau of Labor Statistics (2013) reports that about 64.5 million Americans reported engaging in some type of volunteering in 2012. Additionally, The Bureau reported that the number of volunteers that volunteered in 2011 compared to 2012 decreased 0.3%. An examination of the correlates of turnover could help to reduce turnover in volunteer populations and provide insight into Burnout and job satisfaction have been shown to be related to each other as well as turnover (Lee & Ashforth, 1996). Burnout is primarily viewed as a 3-factor multidimensional construct consisting of emotional exhaustion, depersonalization, and reduced personal accomplishment, though some researchers advocate that emotional exhaustion is the most important dimension of burnout (e.g., Wright & Cropanzano, 1998). Hobfoll's (1989) conservation of resources (COR) theory is used frequently to model the process of burnout. COR theory states there are four types of resources that individuals strive to gain, maintain, and protect: object resources (e.g., housing, clothing), condition resources (job security, seniority), personal characteristics (traits, skills), and resource generating energy (time, money). Burnout occurs when resources are not adequate to meet job demands. Job satisfaction, as a condition resource, should serve as a deterrent to burnout. Two hundred and thirty individuals across two comparable volunteer organizations were sampled for this study. Volunteers were assessed using the Volunteer Program Assessment (VPA) Survey, which assesses many dimensions including organizational commitment, different satisfaction dimensions (satisfaction with work, satisfaction with colleagues, satisfaction with paid staff, etc.), emotional exhaustion, and intentions to quit among others. We were able to generate a structural equation model with good fit ( $\chi^2(15) = 1.94, p = .016, CFI = .979, PCFI = .52, RMSEA = .061$ ) that indicated that global volunteer satisfaction predicted perceived organizational constraints, burnout (emotional exhaustion), and intent to quit volunteer position. Additionally, perceived organizational constraints served as a mediating variable between global satisfaction and both emotional exhaustion and intention to quit (see Figure 1). These results indicate that a volunteer's overall satisfaction with their volunteer experience predicts their experience of emotional exhaustion and whether they will continue to volunteer with the organization. Using

this model, organizations can enact initiatives to increase various aspects of the volunteer experience (e.g., communication, relationship with peers, etc.) in order to retain more volunteers.

#### **UTILIZING OXIDOPYRYLIUM [5+2] CYCLOADDITIONS TO ACCESS CAGED POLYCYCLIC ETHERS**

Primary Group Member: Zwick, Christian

Student Class, Department: Undergraduate, Chemistry

Group Member(s): Stacie Cler, Chemistry, Undergraduate

Mentor(s): Prof. Andrew Mitchell

Author(s): Christian Zwick, Stacie Cler

Our lab focuses on the formation of bridged ethers via [5+2] cycloaddition of an oxidopyrylium intermediate. Addition of an alkene tether to the oxidopyrylium ring leads to the formation of an interesting tricyclic bridged ether molecule. By employing cross-metathesis, we have added an aldehyde to the alkene, which serendipitously led to conjugate addition, forming a tetracyclic ring. Using cross-metathesis we plan to add various functionality to the alkene which could lead to conjugate addition similar to the aldehyde.