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***PENN STATE BEHREND - SIGMA XI***

***2000***

***NINTH ANNUAL***

***UNDERGRADUATE STUDENT RESEARCH***

***AND***

***CREATIVE ACCOMPLISHMENT CONFERENCE***

***ABSTRACT BOOK***

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**Mitochondrial DNA Sequence Polymorphisms Between two migratory american woodcock *(Scolopax minor)* populations**

Alyson R. Baker (Frederic Brenner and Durwood Ray), Grove City College, Department of Biology

The use of mitochondrial DNA (mtDNA) sequences to differentiate between animal populations has greatly increased over the past decade. Conservation biologists welcome new mtDNA sequence data in their effort to identify unique subpopulations within a single animal species. These scientists question whether animal populations that are separated geographically could be unique genetically as well. Our current study addresses this question concerning American woodcock populations of North America. MtDNA was extracted from the feathers of migratory American woodcock from two separate flyways. Portions of the Ribosomal RNA (rRNA) and Cytochrome b (cyt. b) genes were amplified using Polymerase Chain Reaction (PCR) technology. Current project efforts seek to isolate the hyperpolymorphic D-loop region of the mitochondrial genome, which is believed to lie between the rRNA and cyt. b genes. Determination of the exact location and complete nucleotide sequence of this region will allow for D-loop sequence comparisons between birds of each flyway.

THE EFFECTS OF STRESS ON THE IMMUNE SYSTEM AND HOW THIS AFFECTS COLLEGE STUDENTS

# Amy Brown (Donald McKinstry), Penn State Behrend, School of Science - Biology

Recent research has shown that psychological stress has a negative impact on the immune system. The purpose of this literary review was to compare the results of several studies to determine what the impacts of psychological stress are on the immune system and how this may have an impact on college students and their success. Many studies have been conducted on college student success and retention using psychological measures, but the combination of physiological and psychological interactions may lead to a better understanding of college success and retention. This literary review will discuss the combination of the physiological and psychological effects of stress and how they relate to college students. Several areas of research will be reviewed including benzodiazepines, cardiovascular reactivity, lymphocyte subset redistribution, and immune responsiveness.

# SEQUENCING AND CHARACTERIZATION OF ZEBRAFISH ORNITHINE DECARBOXYLASE

MaryJo C. Fontana and (James Warren, Jr.), Penn State Behrend, School of Science - Biology

A random cDNA clone was isolated from a zebrafish (*Danio rerio)* twenty-four hour cDNA library. Initial sequence information was aligned to GenBank using various computer programs including Blastn, Blastx, and GCG pileup, suggesting the identity of the clone isolated is ornithine decarboxylase. Ornithine decarboxylase is an enzyme found in developing stages of cells and oocyte tissue (Showalter, 1992). It catalyzes the first and key step in the biosynthesis of polyamines, which are essential for maintaining cell viability and active macromolecular synthesis by interacting with nucleic acids, proteins, and cellular membranes (Medina, 1999). Ornithine decarboxylase helps to initiate the synthesis of the three amino acid derivatives of polyamines; putrescine, spermidine, and spermine (Moran, 1994). Although their mechanism is not well known, it is firmly established that polyamines play a key role in cell proliferation. In fact, one of the first events in proliferating cells is the induction of polyamine biosynthesis, preceding both nucleic acid and protein synthesis (Medina, 1999). The zebrafish ornithine decarboxylase clone will be fully sequenced and characterized. The location of this clone will be mapped in zebrafish via radiation hybrid mapping (Hukriede, 1999). The sequencing and characterization of zebrafish ornithine decarboxylase will lay the foundation for analyzing this gene in normal development and in developmental mutants.

**SEQUENCING AND CHARACTERIZATION OF THYMIDYLATE SYNTHASE (TS) IN ZEBRAFISH (*Danio rerio)***

Richard L. Gill, Jr. (James Warren, Jr.), Penn State Behrend, School of Science - Biology

Thymidylate Synthase (TS) (E.C.2.1.1.45) catalyzes the methylation of dUMP to dTMP with the participation of the coenzyme 5,10-methylenetetrahydrofolate (folic acid derivative). Inhibition of thymidylate synthase leads to a lack of dTMP which in turn inhibits DNA synthesis in proliferating cells. The inhibition of TS has been the target of many antibacterial and chemotherapeutic drugs. The cloning and characterization of TS has been reported in many organisms but not in the zebrafish (*Danio rerio*). Recently, a cDNA clone representing zebrafish thymidylate synthase has been isolated and sequenced. The cDNA sequence consisted of 1191 bp with an open reading frame of 960 bp which encodes a protein of 319 amino acids. Physical mapping of zebrafish TS by radiation hybrid mapping is currently being undertaken to further characterize TS in zebrafish.

## SALAMANDER POPULATIONS IN THE ALLEGHENY NATIONAL FOREST: THE ROLE OF BRYOPHYTES

Tracy Guenther (Dessie Severson), University of Pittsburgh at Bradford, Division of Natural Sciences - Biology

Invasive plants influence biotic diversity. Management practices in the Alleghenies have created conditions for the spread of *Dennstaedtia punctilobula* (hay-scented fern). We investigated the impact of *D. punctilobula* on bryophyte and salamander populations in the Allegheny National Forest in McKean County, Pennsylvania. Four sites were compared: one terrestrial and one seep with an average of 1.1 hay-scented fern fronds per meter squared and one terrestrial and one seep with no invasive ferns. Both seep sites had more spatial heterogeneity and greater bryophyte and salamander diversity than the terrestrial sites. The invasive-fern sites had an average soil pH of 3.91 and one third fewer *Desmognathus ochrophaeus* (mountain dusky salamander) and fewer bryophytes than the no-invasive-fern sites, with an average soil pH of 4.78 (t=3.44, df=18, p<0.05). The terrestrial-invasive-fern site had 34 bryophyte censuses, with none on bare soil, compared to 43 censuses, with 6 on soil, in the fern-free site.

**ECONOMIC ANALYSIS OF LAKEFRONT PROPERTY FOR SUSTAINABLE COMMUNITY DEVELOPMENT AND LAND CONSERVATION**

Heather L. Lerch (Pamela Silver), Penn State Behrend, School of Science - Biology

Commercial and industrial development for economic enhancement has resulted in urban sprawl, which threatens the last large tracts of contiguous land in rural communities.  The alternative mode of development, which is often overlooked, utilizes the current resources and attributes of a community to bolster the economy.  This arouses interest in whether economic growth must result in urban sprawl.  To assess this, I have determined what the economic returns are for each type of development (classic verses industrial).  I then factored in quality-of-life issues with regard to the two types of development.  In this study, I am assessing the Coho Site property as a model system for rural land development.  This 640-acre property, stretching along one mile of the southern Lake Erie shore, is the last contiguous tract of land in Western Pennsylvania.  The developmental potential of the land includes the traditional expansive type of development (industrial).  However, utilization of its rich archeological (museum and education) and natural resource base (fishing and tourism) for development has great economic potential.  The economic impact of these two alternatives was compared by assessing economic data from current area businesses and inferring economic potential on the lakefront property.  As land availability continues to decrease, and concern grows for the environmental and economic impact of development, communities are devising modes of development in conjunction with state and local groups that will reap the most economic potential.

## Sequencing and Mapping of a Putative Apoptosis Associated Factor in Zebrafish

Kristy Netkowicz and E.J. Fink (James Warren, Jr.), Penn State Behrend, School of Science - Biology

Apoptosis, or programmed cell death, is an important process in embryogenesis, metamorphosis, endocrine dependent tissue atrophy, defense against pathogen infection and cellular damage, and normal tissue turnover (Nagata, 1996). Apoptosis can be mediated through the Fas/Apo-1cellular receptor, which belongs to the tumor necrosis family. Activation of the Fas/Apo-1 receptor initiates an intracellular pathway leading to apoptosis and subsequent cell death. The pathway activated by Fas/Apo-1 is multifaceted and includes a number of proteins including Fas associated factor 1, or FAF1 (Chu *et al*., 1995). The exact role of FAF1 is not thoroughly understood. A gene homologous to FAF1 has been isolated from zebrafish. The zebrafish FAF1 will be fully sequenced, characterized, and localized within the zebrafish genome using radiation hybrid mapping. This work will lead to future *in situ* hybridization studies of zfFAF1 to deduce its role in zebrafish development. The further characterization of zfFAF1 will hopefully lead to a better understanding of its function in the Fas/Apo-1 signaling pathway for apoptosis and the role it may play in vertebrate development.

**CHARACTERIZATION OF AN INTERGENIC SPACER AS A MEANS OF MEASURING GENETIC DIVERSITY IN THE SPOTTED SALAMANDER (*Ambystoma maculatum*)**

Jennifer A. Osmanski (Michael Campbell), Penn State Behrend, School of Science - Biology

Two major wetland areas on the Penn State Behrend campus are currently important breeding grounds for the spotted salamander, *Ambystoma maculatum*. Increased campus expansion is thought to be affecting the migration and reproduction of these populations. Studies on amphibian DNA and evolutionary history indicate that an intergenic spacer in the mitochondrial DNA of the spotted salamander, *A. maculatum*, has a highly variable coding sequence located between the coding regions for tRNAthr and tRNApro. This spacer tends to change 3-4 times more rapidly in evolutionary lines than normally found in other amphibian species, revealing signs of reproductive isolation between populations of *A. maculatum*. Total genomic DNA was isolated from eggs collected from upland and lowland regions of the Penn State Behrend campus. The mitochondrial intergenic sequence was amplified by polymerase chain reaction (PCR) and the amplification products were sequenced using fluorescent Dye Terminator (ABI Prism) and an internal primer (SALLYSEQ). The resulting sequences were analyzed using the GCG PILEUP program (Oxford Molecular Group). Sequence alignments revealed that the mtDNA from salamanders located in the upland wetland areas contains a unique sequence pattern, indicating possible reproductive isolation. Since *A. maculatum* lives in both aquatic and terrestrial environments, further research is being conducted using the toes of *A. maculatum* individuals. At this time, *A. maculatum* toes have shown preliminary evidence of sequence similarity to those of eggs. Further research on the *Ambystoma* toe DNA is being done in order to support the initial findings of population reproductive isolation.

**The Mutagenic Effects of Anthracyclines in the Bacterium *Salmonella typhimurium***

Lisa A. Phelps (William Mackay), Edinboro University of Pennsylvania, Department of Biology and Health Services - Pre Medicine

Anthracyclines are mutagenic antibiotics that are widely used in chemotherapy procedures for the treatment of a variety of malignant tumors. Anthracyclines arrest tumor cell growth by interacting with cellular DNA. The objective of this research project is to study the induction of transition mutations with adriamycin and daunomycin in the bacterium *Salmonella typhimurium*. The first genotoxicity assay to be optimized for convenience and sensitivity is called the Ames Test. The *his* reversion assays were performed in triplicate using a modified version of the traditional Ames “plate-incorporation” test. In this study, we show that adriamycin can induce both frameshift and base-substitution events*.* Specifically, frameshift mutations (TA98) were induced 15.4 fold, and GC to AT base-substitution mutations (TA7004) were induced 5.8 fold above spontaneous levels. Although AT to GC base-substitution mutations (TA7001) were induced with daunomycin, adriamycin did not induce this transition event.

ISOLATION OF AND PCR PRIMER DESIGN OF A DNA SEQUENCE OF VARIABILITY WITHIN A CHIRONOMID POPULATION

Lauren L. Richards (Larry Eckroat), Penn State Behrend, School of Science - Biology

The technique of random amplification of polymorphic DNA (RAPD) was applied to determine a genetic sequence of variability from genomic DNA isolated from random individuals within a population of Chironomids. RAPD analysis is a recently developed technique that can create genomic fingerprints from a species of which little genetic information is known. However, RAPD markers are often difficult to replicate in complex population studies due to the use of short random primers used for amplification. In order to develop more robust genetic markers, we cloned a variable RAPD marker with the intention of developing longer primer sets specific to a variable RAPD marker within the population. To accomplish this, a series of six random 10-mer’s were used to give multiple PCR amplification products. These products were then visualized by gel electrophoresis to determine variability within the population. The variable bands were cut from the gel, isolated, amplified once again, and cloned into a TOPO vector. The cloned DNA was purified through a plasmid miniprep and sequenced using dye-terminator chemistry. The sequenced DNA will then be used to design a PCR primer specific to the variable RAPD product within the Chironomid population. Further research should show that the primer designed will amplify this specific sequence when used with genomic DNA from the same population. This should result in a more reliable and reproducible genetic marker for Chironomid population genetics.

**Mitochondrial DNA Sequence Polymorphisms Between Populations of Migrant and Resident Canada Geese *(Brantis canadensis)* in North America**

Matthew D. Show, Joseph Sanchez, Leanne Hubiak Speering, and Patrick Barry (Frederic Brenner and Durwood Ray), Grove City College, Department of Biology

Mechanisms of bird migration have always been a source of debate in avian biology. A related topic questions why some birds of a species migrate while others remain year-round residents of their normally summer-only habitat. The present study seeks to find genetic differences present within a species hypervariable region of the mitochondrial genome of canada geese (*Brantis canadensis)* that are from populations of migrant and resident birds in North America. Mitochondrial DNA (mtDNA) was extracted from the livers of canada geese and portions of the Ribosomal RNA (rRNA) and Cytochrome b (cyt. b) genes were amplified using Polymerase Chain Reaction (PCR) technology and sequenced by dye-terminator chemistry. Current project efforts seek to isolate the hyperpolymorphic D-loop region of the mtDNA genome, which lies between the rRNA and cyt. b genes, and then perform sequence comparisons of this region in the two geese populations.

**ANALYSIS OF THE MAJOR ODORANTS FOUND IN COLD PRESSED KEY LIME OILS USING GAS CHROMATOGRAPHY-OLFACTOMETRY (GCO), MASS SPECTROMETRY (GC-MS), AND SOLID PHASE MICROEXTRACTION (SPME)**

Gina M. Gaskey (Mary Chisholm), Penn State Behrend, School of Science - Chemistry

The peel oils from Key Lime (*Citrus aurantifolia*, Swingle), widely used as a flavorant in the beverage industry, were analyzed to determine their aroma composition using GCO, GC-MS, and SPME. Gas Chromatography-Olfactometry is an aroma bioassay that combines the high- resolution capability of a gas chromatograph with the sensitivity of the human nose, which is used as a selective detector to identify compounds with odor-activity in the lime extract. Using the resulting aroma chromatograms, the compounds having the most intense odors were identified and characterized by their retention index and odor descriptor. Many of these compounds were then identified using GC-MS. In an attempt to identify additional volatile odorants, solid phase microextraction, SPME, a solventless extraction technique, was used for trapping and concentrating low molecular weight samples from the headspace vapors. Three different fibers were used in this analysis to determine the most effective adsorbent for trapping the odorants. Significant differences were found between the three fibers used. Many odorants remain unidentified in the Key Lime oil because they are present in quantities too low to be easily identified except by their odor.

**EMBEDDED INTERNET TECHNOLOGY**

James Carucci, Jr., Justin Nardone, and Evan Nicolls (Kevin Torres), Penn State Behrend, School of Engineering and Engineering Technology - Electrical Engineering Technology

The stage is set for explosion in Internet connection of embedded devices. Embedding the Internet is an up-and-coming technology, only two or three years old. This technology takes away any boundaries that may have existed before in industry, including distance and expense. Companies that do not update their control systems to use embedded Internet technology are going to find their systems obsolete in the near future. This technology has a wide range of uses, from simple monitoring to diagnostics and control. Embedded Internet devices could be made to control your very own car or to monitor your multi-million dollar piece of equipment to prevent serious downtime and costs. The simple applications are still not worth the money for an embedded Internet system, but it is worth the money to monitor or control a multi-million dollar piece of equipment or factory. Our task for Penn State Behrend’s senior design project is to develop a simple example of this technology. A hardware representation of a peg game, seen at many restaurant tables, will be controlled via a Web page. This Web page will have a graphical representation of the peg board and a video feed of the actual board to see the real movement of the hardware. A group of manufacturers have made all necessary programs and hardware to interlock so this technology can become a reality for many companies, local and global.

CAN A MORAL GOD EXIST IN AN AMORAL NATURAL WORLD?

Nicole Canter (James O’Loughlin), Penn State Behrend, School of Humanities and Social Sciences - English

John Burroughs was a leading nature writer in the late nineteenth and early twentieth centuries. His scientific observations focused on Nature as an entity more powerful than God; Burroughs believes that any God humans can conceive of is inadequate due to the immenseness of the universe and Nature’s power in it. By giving Nature human-like qualities, man believes he can comprehend God and thus Nature. Burroughs thinks this is incorrect – that the universe, creation, and Nature are far too complex and infinite to grasp. But man still demands the existence of something above and beyond Nature, a higher power. The human race might possibly view Nature as the connecting link between man and that higher power. This is the influence of Christianity and the Church. The Church created a moral, merciful God who gave man life. And frequently when natural disasters occur, man will say, “It is the wrath of God,” or “…the sterner aspects of thy face.” But isn’t this assigning negative human qualities to God, who is supposed to be all-benevolent, merciful, and sparing? Consequently, Burroughs argues that the “higher power” is Nature herself, who is amoral: without human motives in her complex cycle of life and death. Burroughs makes a strong argument for Nature as the ruling force on Earth, with a Providence ultimately beneficial to man. But does he contradict himself in giving Nature the human quality of Providence? Is it because he knows man would not exist without some (human-like) benevolence on Nature’s part?

## THE MEANING AND BEING OF WATER AND TREES

Jackson Connor and Ron Hayes (Ann Pancake and John Champagne), Penn State Behrend, School of Humanities and Social Sciences - English

In his essay, the “Myth of Sisyphus” (1942), novelist and Existential philosopher Albert Camus asserted that the human condition was devoid of purpose and so concluding deemed our existence “essentially absurd.” By the late 1950s and early 1960s, dramatists such as Samuel Beckett, Eugene Ionesco, and Harold Pinter were writing plays for which the term “absurd”—in the strictest sense defined by Camus—was a natural fit. Celebrated for their pessimism and hopeless views of humanity, plays such as Beckett’s *Waiting for Godot* and Ionesco’s *The Bald Soprano* are looked upon by critics as seminal works that define the Theater of the Absurd. This presentation explores the ramifications of the Theater of the Absurd on contemporary theater. Beginning with a reading of Jackson Connor’s original one-act play, *The Meaning and Being of Water and Trees*, the presentation will conclude with critical analysis by Ron Hayes that details elements of Absurdist theater as found in Connor’s work vis-à-vis today’s dramatic conventions. In essence, this presentation will be a unique addition to the program because it showcases the creative accomplishments of one Behrend student (Jackson Connor) and highlights the critical capabilities of another (Ron Hayes).

“KADDISH,” “WHITE SHROUD,” AND “BLACK SHROUD”: NAOMI GINSBERG’S INFLUENCE ON IDENTITY

Anne M. Rajotte (Greg Morris), Penn State Behrend, School of Humanities and Social Sciences - English

Allen Ginsberg’s relationship with his mother, Naomi, is the subject in one of his major poems, “Kaddish,” as well as two subsequent poems, “White Shroud” and “Black Shroud.” In “Kaddish,” Ginsberg shows Naomi’s struggle with mental illness and his own reaction to it. This poem explores Ginsberg’s childhood relationship with his mother and how her illness affected him in his adult life. His own fear of mental illness and his responsibility for her care becomes a theme in his subsequent poetry. His later poems “White Shroud” and “Black Shroud” are two dream accounts of seeing his mother after her death. These poems deal with his doubt about his choices in regard to her care and his own feelings of anger and frustration at his mother’s condition. These three poems work together to create a picture of Naomi Ginsberg’s influence on Allen Ginsberg.

THE TAFT ADMINISTRATION’S RESPONSE TO THE CHINESE REVOLUTION, 1911-1912

Chris Cairns (John Rossi), Penn State Behrend, School of Humanities and Social Sciences -History

This presentation focuses on the Taft administration’s response to the overthrow of the Ch’ing dynasty in 1911 and the subsequent establishment of the Republic of China (ROC) in 1912, which provided a brief opportunity for China to develop a democratic system. My research reveals that after the ROC replaced the Ch’ing, it stood on precarious political and financial grounds; it needed capital to consolidate a government and political recognition to normalize relations. However, the Taft administration, in cooperation with the “Six-Power Consortium,” adopted a “no-loan” and nonrecognition policy. This policy was designed to force the ROC to accept terms that would have handed over China’s resources to international control. The Taft administration favored the interests of the private banking industry, including J.P. Morgan & Co., Kuhn Loeb & Co., the First National Bank, and the National City Bank, as well as American businesses with stakes in China. In effect, the policies the Taft administration developed did little to assist the Chinese in their effort to develop a democratic republic, focusing rather on America’s economic interests.

**AN ANALYSIS OF THE CIVIL WAR DIARY OF MARY GREENHOW LEE**

Nadine Katherine Cross (Ralph Eckert), Penn State Behrend, School of Humanities and Social Sciences – History

My project is an analysis of the Civil War diary of Mary Greenhow Lee, a southern woman residing in the Shenandoah Valley town of Winchester, Virginia, one of the most fought-over areas during the war. This March 11, 1862 to February 24, 1865, diary provides a unique perspective on the War Between the States – that of a knowledgeable, well-read, eloquent southern woman who possessed a nearly unshakable dedication to the cause of the Confederacy. My thesis examines Mary Lee’s emotions, activities, world view, and commitment to southern nationalism and how each was affected by the conditions of America’s most disruptive, internecine war. My major focus is how nearly every aspect of her life was changed by the conditions of the war. In essence, by examining her varying states of mind during the major campaigns in and around Winchester, I will illuminate how her perspective on the war, the southern cause, and southern womanhood evolved as the conflict raged on seemingly interminably.

## LOUIS MARX & COMPANY

Michael Frawley (James O’Loughlin), Penn State Behrend, School of Humanities and Social Sciences - History

Louis Marx & Co. was a toy company with its major factories in the Erie area. Louis Marx became the Henry Ford of the toy industry. He used mass production and mass distribution to be able to market his toy at a price that everyone could afford. This first factory that Marx purchased was on West 19th Street in Erie, and as the company expanded he purchased various other sites in Erie and Girard. The company was founded just after the end of World War I. It grew by leaps and bounds throughout the 1920s and 1930s, even with the onset of the Great Depression. During World War II, like many other factories, Marx switched over to producing war goods, especially artillery shells. After the war, Marx toured Germany as an advisor to General Eisenhower and got his feet wet on the international scene. The company continued to grow throughout the 1950s and 1960s; with Marx becoming so famous that he was featured on the cover of *Time Magazine* in December of 1955. In 1972, Marx decided that he was getting too old to run the company and sold it to Quaker Oats Company. This was the end of Marx Toys, with the factories being sold after Quaker lost a large amount of money on it. Marx employed two generations of Erie workers and left behind a legacy of as one of the premier toy manufacturers in the world.

Patterns of Credit Card Usage Among High vs. Low Academic

Performers

Katie D. Granetto (Mary Beth Pinto, Diane Parente, and Todd Palmer), Penn State Behrend, School of Business - Management

Much has been written in the popular press on credit card usage and spending patterns of American college students. The proliferation of credit cards and their ease of acquisition ensures that students today have more opportunities for making credit purchases than any past generation of college students. Indeed, college campuses have become one of the most common sites for undergraduates, many with no credit history, to acquire sometimes multiple credit cards. In spite of this “easy credit,” increasingly, college officials and consumer advocacy groups are voicing their concerns about the effect that unlimited access to credit card spending may have on college student performance. Specifically, they argue that the sort of enhanced spending opportunities available through easy access to credit cards are likely to increase students’ anxiety levels about carrying debt, increase their need to work extended hours in order to pay off outstanding balances, and adversely affect academic performance. We conducted a study at three college campuses in northwestern Pennsylvania, collecting a total of 1,025 questionnaires from students concerning their credit card histories, usage patterns, class standing, debt anxiety, and academic performance. We expect our findings to offer some important policy implications for college administrators as they develop policies regarding on-campus credit card solicitation as well as offer some direct evidence of the effect that credit card spending is having on the current generation of college students.

# ELECTRONIC SUPPLY CHAIN MANAGEMENT RESEARCH: 1989 – 1998

Candace C. Klein (Diane Parente and Michael Ishman [Niagara University]), Penn State Behrend, School of Business - Operations Management

The emphasis on core competencies in an organization and the growth in technology has brought Supply Chain Management (SCM) to the forefront of modern business. The development of the Internet has led to vastly different ways of accomplishing the information exchange in the supply chain. The purpose of this study is to relate e-commerce and supply chain management by studying the academic research over a ten-year period. The intent of this project is to examine and specify the current state of research in supply chain management and to lay the groundwork for a research agenda. The design of this study consisted of initially ranking the top journals in the following disciplines: Management, Logistics, Marketing, Operations, Strategy, and Management Information Systems. This ranking was made through combining official ranking studies or agencies (e.g. Starbuck's top 300 management journals, ANBAR Research Rankings), various research articles that ranked journals, and by the use of a Delphi study. The results were used to determine the top five professional journals in each of six disciplines. Next, each of the top journals was examined to find trends in the volume or type of research done on supply chain management and e-commerce. These results are currently being tabulated to determine trends and formulate future research questions.

### CUSTOMER SATISFACTION WITH FINANCIAL SYSTEMS

Keri Bieliski and Cynthia Sanner (Syed Andaleeb), Penn State Behrend, School of Business - Marketing

Customer service is the central concern for all service businesses today. We wanted to find out its importance and its ability to explain customer satisfaction with financial institutions. A survey was designed that included demographic and attitude questions. To obtain data, we used a combination of probability and non-probability sampling methods. This included both convenience sampling and systematic sampling. Our sampling frame consisted of people within the Erie County area. We also wanted to see if there were differences in satisfaction ratings among people in different income brackets. We hypothesized that people who had an annual income of $30,000 or more were likely to be more satisfied with their financial institutions. This is due to relationship marketing employed by financial institutions that provide better services to the profitable clients. Thus, higher income groups may feel that they receive more personal care. The results indicated that people who have confidence with their financial institutions and believe that they are being treated fairly have a higher satisfaction level with their financial institutions than those who do not feel this way. Also, people who are within a higher income bracket are generally more satisfied with their financial institutions.

EMPLOYEE AND CUSTOMER SATISFACTION OF THE RED APPLE/KWIK FILL CONVENIENCE STORE CHAIN

Carolyn J. Conway (Syed Andaleeb), Penn State Behrend, School of Business - Marketing

Recent research has shown there is a correlation between customer and employee satisfaction in the convenience store industry. The purpose of this study was to assess the Red Apple/Kwik Fill Convenience Store chain in terms of employee and customer satisfaction models. The corporate policies and practices of Kwik Fill were examined for their conceptual views of customer and employee satisfaction and to determine if their service design matched the employees’ and customers’ expectations. Separate models for customer and employee satisfaction were developed with each having their own constructs defining satisfaction with independent variables. The constructs for each model were statistically tested by multiple regression and stepwise regression. The independent variables for each construct were combined to create a new single variable that was tested again by multiple regression. For the employee, it was statistically determined their ability to please the customer is significant, but a higher level of job satisfaction is achieved by their relationship with their supervisor. In an industry selling low- priced items in mass volume to the general public, it was statistically determined that the human element was the most significant independent variable.

A PRELIMINARY ANALYSIS OF EXERCISE AND ITS EFFECTS ON STRESS IN COLLEGE STUDENTS

Garrett Arndt, Tiffany Buck, and Kristine DiMarzo (Victoria Kazmerski), Penn State Behrend, School of Humanities and Social Sciences - Psychology

The purpose of the current study was to examine the effects of exercise on perceived stress in college students. College students who exercise were compared to those who do not exercise to determine the effects of stress in their lives. The participants consisted of both male and female undergraduate college students. The participants completed two surveys; the first survey assessed exercise behavior and the second survey examined perceived stress. The exercise survey was developed by the experimenters, and the stress survey administered was the Perceived Stress Scale. Following the exercise survey, participants were subjected to a mental stress task, the Modified Stroop Word Color task. This task was completed on a computer. Upon completion of the exercise survey, participants were categorized into 1 of 3 exercise levels: no/low, moderate, or high-exercise groups. The results will be presented to test two hypotheses: 1) participants who exercise will be less stressed than those who do not exercise and 2) participants in the high exercise group will be less stressed than participants in the no/low exercise group.

# EFFECTS OF NEUTRAL, EROTIC, AND VIOLENT VIDEO STIMULI ON MEMORY

Carrie L. Kish, Sara A. Lawrence, and Mary H. Pietrzak (Victoria Kazmerski), Penn State Behrend, School of Humanities and Social Sciences - Psychology

The purpose of this study is to determine the effects of violent, neutral, and erotic stimuli on memory for both males and females. According to research, the neutral stimuli should have little effect on memory for both males and females. Effects in recall will be seen between genders for erotic and violent stimuli. Sixty participants will be recruited from Introductory Psychology courses and assigned randomly to one of the 3 stimuli groups. All groups will be asked to remember a word list of 20 non-ambiguous, non-violent, and non-erotic nouns. A two-factor between subjects design will be used to analyze the data. Results will show that neutral stimuli have little effect on memory between genders, and erotic/violent stimuli will have an effect on memory.

SWIMMING PERFORMANCE OF NORTH AMERICAN MINNOWS

Eric J. Billman (Mark Pyron), Penn State Behrend, School of Science - Biology

We compared swimming performance of minnows in a laboratory chamber to test if performance is a reflection of the habitat in which they are normally found or if swimming performance is a product of their evolutionary history (more closely related taxa have more similar performance functions). We measured the ability of individual minnows to maintain position in a flow-through laboratory swimming chamber, following a two-week acclimation period. We examined effects of morphology on swimming performance by including body shape variables that were reduced with principal components. Our regression analyses included control for phylogenetic relatedness through the use of independent contrasts.

**PHENOTYPIC CHARACTERIZATION OF NEURAL DEVELOPMENT GENES IN *Drosophila***

Star Dunham and Dan Mong (Lauren Yaich), University of Pittsburgh at Bradford, Division of Natural Sciences - Biology

A cascade of genetic interactions is involved in the development of the *Drosophila* nervous system. A key gene in this process is named *cut*. Flies that are mutant for *cut* have one type of sensory organ (external sensory organs) transformed into another type of sensory organ (chordotonal organs). Conversely, when *cut* is overexpressed, chordotonal organs are transformed into external sensory organs. A genetic screen was carried out to identify genes that interact with *cut*. Several genes were identified, including some that have already been cloned, such as *Delta* and *enabled*, and others that still remain to be characterized. The characterization of several of these novel genes by immunohistochemical staining with neural specific antibodies will be presented. A potential new function for *cut* in terms of head development will also be described.

## SEQUENCE ANALYSIS OF THE COI GENE Of *Bombus* nr. *borealis*

Jeremy Hasseman (Stephen Jenkins and Durwood Ray), Grove City College, Biology Department

North American species of bumble bee (genus *Bombus*) are poorly represented in published genetic databanks. Therefore, the purpose of our research was the amplification and sequencing of the cytochrome oxidase subunit I (COI) gene from the mitochondrial genome of a bumble bee in western Pennsylvania. We report the successful extraction, amplification, and sequencing of a segment of the COI mitochondrial gene from a bumble bee tentatively identified as near *Bombus* (*Megabombus*) *borealis*. Our consensus sequence was different from all published sequences, though it was most similar to a fragment of the COI gene of other *Bombus* species. The sequence contained 11 single nucleotide polymorphisms (SNPs) out of 311 nucleotides compared with the COI sequence of *B. lapponicus*, the most similar of the published sequences. Our consensus sequence was also significantly different (22 SNP’s out of 304 nucleotides) from another bumble bee (*Bombus* sp. ‘western pennsylvania isolate’) previously sequenced in our lab. This novel sequence may yield significant information for classification of species within the genus *Bombus*. To that end, we plan to continue sequencing North American *Bombus* material.

**EFFECTIVENESS OF A COMBINED VERTICAL FLOW SYSTEM AND CONSTRUCTED WETLAND IN AMELIORATING ACID MINE DRAINAGE**

Kimberly D. Kosick and Corrie A. Gardner (Frederic Brenner), Grove City College, Department of Biology

In the spring of 1998, a two-cell wetland was constructed at Jenning’s Environmental Education Center in Slippery Rock, Pennsylvania. The mine runoff first enters a vertical flow system (VFS) containing a 1:1 mixture by volume of mushroom compost and limestone. The effluent from the VFS then flows into a test-bed wetland for further treatment, which also contains a 1:1 mixture by volume of mushroom compost and limestone. Water samples from eight locations in the system are collected weekly and analyzed for nine water-quality parameters. Conductivity, total dissolved solids, and pH have been analyzed using field meters. Titration methods were used to quantify the acidity and alkalinity of the water. Iron, manganese, and aluminum have been analyzed using Hach colorimetery methods and, within the last three months, atomic absorption spectroscopy. The average pH of the influent pH is 3.73 with an effluent pH of 6.58, for an overall 76% increase. The acidity of the effluent leaving the wetland was reduced approximately 78% with a corresponding alkaline addition of between 70 and 90 mg per liter. Iron and manganese concentrations have been reduced by 84% and 20%, respectively. The differences in the effectiveness of removing metals from the runoff with regards to oxidative and reductive environments will be discussed.

## UPTAKE OF AMINO ACID TAURINE IN PROSTATE CANCER CELLS

Jon Vanderweel (Melissa Barranger Mathys and Julian Mesina), Mercyhurst College, Department of Chemistry - Biochemistry and Physics and Lake Erie College of Osteopathic Medicine

Taurine (2-aminoethanesulfonic acid) is the most abundant free "amino acid" with a wide variety of physiological actions.  This amino acid is not incorporated into proteins but may play a large role in modulation of neurotransmitter release and attenuation of hypercholesterolemia.  Despite nearly two decades of research on this compound, an understanding of its role as a radioprotective agent has been slow to evolve. The first phase involved the quantitative analysis of taurine.  Since this "amino acid" has no intrinsic fluorescence or visible absorbance, the formation of an adduct is necessary.  This will allow the concentration of taurine inside or outside of cells to be monitored on a nanomolar (nmol) level.  Prostate cells are used as model system to investigate taurine. This research concentrates on the fluorescence characterization of taurine and its uptake capacity in normal as well as prostate cancer cells.

## The Modernization of Analog Instruments (Catching Up with Society)

Brent W. Blood (Thomas Spudich and Tracy Halmi), Penn State Behrend, School of Science -Chemistry

Currently, there are many instruments in academia that use stripchart recorders to acquire data. This can be a major disadvantage in terms of analyzing and presenting data in a research quality format. One can adapt the instruments to acquire data digitally using modern technology and methodology. We have recently acquired a portable computer and analog to digital converter that we can use to gather and analyze data electronically. In using this data acquisition system, programs must be written to acquire the data so one can analyze it. This can be done using any programming language; we chose "G" and "C++" as our languages. Our instrumentation labs have two instruments in which this has been accomplished. The first, an Infrared (IR) spectrometer, a 3-200 Infrared Spectrophotometer (Sargent Welch), acquires data in terms of percent transmittance versus wavenumber (time) and plots the data using a built-in stripchart recorder. A program has been successfully written to accomplish this task digitally. The second instrument, a 5890 Gas Chromatograph (Hewlett Packard), has been successfully interfaced as well to acquire a digital signal versus time. Also, a second program for this instrument has been written to integrate and acquire peak areas of the acquired data.

**ANALYSIS OF THE MAJOR ODORANTS FOUND IN THE JUICE AND PEEL OILS OF *Citrus clementine* HORT.**

Dean M. Cass, Jr. and Jason A. Jell (Mary Chisholm), Penn State Behrend, School of Science - Chemistry

The key odorants in clementine juice and essential oils were identified using the methods recently reported in the analysis of grapefruit and Valencia oranges. The analysis of the juice and oils was carried out separately for each sample. For the juice, clementines were hand squeezed and quickly placed into a saturated calcium chloride solution. The organic components were extracted in a 50:50 v:v pentane/ether solution and concentrated. This solution was then ready for analysis. For the oils, the top layer of the peel was scraped from the fruit. The organic components were then extracted with 50:50 v:v pentane/ether solution from the peel scrapings and concentrated. This solution was then ready for analysis. For both juice and oils, odorants were detected using gas chromatography – olfactometry, an aroma-bioassay. The odorants were then identified using gas chromatography – mass spectrometry. Some odorants not previously reported were identified.

## WHAT PUT THE “PAP” IN PAPRIKA?

Jenifer D’Annibale and KaraLee Parsons (Tracy Halmi), Penn State Behrend, School of Science - Chemistry

At Penn State Erie, chemistry and biology majors are required to take an 8-credit sequence in organic chemistry. The difficulty of these courses discourages students from relating the laboratory portion of the class to their chosen major and everyday experiences. To motivate these students, we have updated an out-of-print macroscale natural-product separation of paprika to fit our time constraints and equipment limitations. By using a common household spice and solvents that are more environmentally friendly than the original procedure, we hope to expose students to various components of chemistry while maintaining their interest. Some of the techniques used to explore the brightly colored components of paprika include column chromatography and UV-VIS spectroscopy. Several compounds were separated and characterized from paprika including: capsanthin, the largest component of paprika that provides the deep red color; beta-carotene, the most important of the provitamins A; and capsaicin, the compound that adds the pungent flavor to this widely used spice. This experiment was researched and repeated until it could be easily reproduced by any CHEM 36 student and was then incorporated into CHEM 036B, a newly developed course that was designed specifically for biology majors who are taking organic chemistry.

**SYNTHESIS AND CHARACTERIZATION OF A MACROCYCLIC LIGAND: TETRAAZA[1,6,11,16][*b,g,l,j*]TETRABENZOCYCLOEICOSINE**

Gina M. Gaskey (Alan Jircitano), Penn State Behrend, School of Science - Chemistry

A ligand having a large center cavity may better accommodate metals of larger size, specifically second- or third-row transition metals or lanthanide ions. The target molecule of this research is 2-(aminomethyl)benzaldehyde (**I** - amb). Schiff base condensation of four molecules of amb in the presence of a transition metal ion would give a macrocyclic ligand with a 20-membered inner ring. The ligand is synthesized by first adding CN-, through a Sandmeyer reaction, to methyl anthranilate. Two additional steps are needed to form amb: reduction with lithium aluminum hydride, followed by oxidation (MnO2, pyridinium dichromate, or CrO2) to the aldehyde. The final step in this synthesis consists of the aminobenzaldehyde being cyclized around a transition metal or lanthanide ion into a macrocycle. A complex of this nature could be used as a Magnetic Resonance Imaging (MRI) contrast agent. Progress toward the synthesis will be discussed.

**STUDIES OF PHOTOCHROMIC PT(II) COMPOUNDS OF *o*-AMINOBENZ-ALDEHYDE AND ITS DERIVATIVES**

Jeremy A. Jackson (Alan Jircitano), Penn State Behrend, School of Science - Chemistry

The molecule *o*-aminobenzaldehyde (oab) can undergo Schiff-base self-condensation reactions in which the carbonyl of one molecule reacts with the amine on a different molecule to produce a carbon-nitrogen bond called an imine. For example, four molecules of oab can condense around a metal ion and coordinate to the metal through the imine nitrogens. The complex that results is the macrocycle known as TAAB. However, in this study, Pt(II) does not form TAAB directly. Instead, an intermediate linear dimeric condensate is formed. This is called *cis*-[N-(*o*-amino-benzylidene)anthranilaldehydato-O,N,N’]-chloroplatinum(II), Pt(AAA)Cl. This molecule is observed to undergo a photochromic reaction (**I**) in several solvents. In order to study the electronic and substituent position effects on the photochromic reaction, four derivatives of Pt(AAA)Cl were synthesized: 4-chloro, 5-chloro, 4-methyl and 5-methyl. The 4-chloro and 5-methyl were found to be non-photochromic, while the 5-chloro and 4-methyl were found to be photochromic. The insights this gives to the mechanism of the photochromic reaction will be discussed.

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# RADIATION CHARACTERIZATION OF PHOTOCHROMIC Pt(II) COMPOUNDS OF *o*-AMINOBENZALDEHYDE AND DERIVATIVES

Bryan C. Katzenmeyer (Thomas Spudich and Alan Jircitano), Penn State Behrend, School of Science - Chemistry

Work has been done focusing on the synthesis of platinum (II) compounds of *o*-aminobenzaldehyde and derivatives. It was noted that the synthesized compound, *cis*-[N-(o-aminobenzylidene)anthranilaldehydato-O,N,N’]-chloroplatinum(II), Pt(AAA)Cl, undergoes a color change while being in the dark or not being exposed to visible radiation. The reaction observed is dependent on the radiation being present, or is a photochromic reaction. The synthesis of the Pt(AAA)Cl can be done by reacting *o*-aminobenzaldehyde (oab) with potassium tetrachloroplatinate with water as the solvent. It has been found that the compound, Pt(AAA)Cl, when in a solvent such as acetonitrile, reacts with the solvent when the solution is in the absence of radiation.

The solution was traversed by radiation (h generated by a Spectrophotometer-20 at defined wavelengths. This wavelength range is from 400 nm to 700 nm in 50 nm increments. The reaction was characterized using a UV-VIS spectrophotometer (PC-2000, Ocean Optics, Dunedin, FL) measuring the absorbance of the solution over time. The results obtained will give conclusions whether or not photon-specific or wavelength-specific.

## SYNTHESIS OF METAL COMPLEXES USING DI-2-PYRIDYL KETONE ANALOGUES

Ian K. Moon (Alan Jircitano), Penn State Behrend, School of Science - Chemistry

Metal complexes of di-2-pyridyl ketone (**I** - DPK) and its analogues have exhibited interesting chemical properties and yielded unique crystal structures. These complexes may prove useful in extended systems as organometallic conducting polymers. The objective of the research is to synthesize a series of different DPK analogues, coordinate them to metals, and investigate their metal coordination properties and examine their unique crystalline structures. Several variables have been investigated including ring size (5 or 6 membered), coordinating element (O, N, and S all coordinate to different types of metals), and the different type of metals themselves. Derivatives synthesized and the crystal structure of a copper complex will be discussed.

**The Development of a Graphite Furnace Atomic Absorption Lab for Instrumental Analysis**

Adrian V. Psuty and Jennifer K. Herrmann (Thomas Spudich), Penn State Behrend, School of Science - Chemistry

This research project was conducted to develop a method (or procedure) for trace metal analysis of animal products using graphite furnace atomic absorption spectroscopy. The development of this sample preparation involves a variation of EPA methods in the analysis of lead concentrations in Bovine sample (Bovine Muscle Powder, Reference Material 814, NIST). The procedure that was designed for the undergraduate instrumental analysis courses offered at Penn State Erie. The development of this procedure has led to the development of other procedures for trace metal analysis of soil and sediment samples. These procedures will provide a base from which future students can build in the development of new procedures that fulfill the course requirements and are tailored to student's interests.

## SYNTHESIS AND CHARACTERIZATION OF A POTENTIAL MAGNETIC RESONANCE IMAGING CONTRAST AGENT

James E. Sarson (Alan Jircitano), Penn State Behrend, School of Science - Chemistry

Magnetic resonance imaging (MRI) is a technique used primarily to produce high-quality images of the inside of the human body. MRI contrast agents are compounds that are introduced to enhance the contrast between healthy and diseased tissues and aid in diagnosing physiological disorders. Complexes of lanthanide(III) ions are effective as MRI contrast agents because of the dispersive effect of their unpaired *f*-electrons on the absorption peaks of water molecules bonded to the metal ion. This research involves a ligand (I) that has been designed as a neutral (when coordinated to 3+ metal ions), macrocyclic complex. The ligand can be made through a template, Schiff-base self-condensation reaction of three molecules of 7-amino-2-indole-carboxaldehyde. The first step in making the ligand precursor is the synthesis of a nitro-phenylhydrazone through a diazonium salt intermediate, known as the Japp-Klingemann reaction. Next the hydrazone undergoes a Fischer Indolization forming a nitroindolecarboxylate. This is followed by the reduction of the nitro group to an amine, the reduction of the carboxylate to an alcohol and the oxidation of the resultant alcohol to an aldehyde. The ligand precursor has been made, along with the 5-methyl derivative. The synthesis, characterization, and progress towards making macrocylic complexes will be discussed.

**The Characterization and Use of an Acousto-Optic Background Correction System for Atomic Emission Spectrometry**

Jeffrey R. Uhal and Bryan Katzenmeyer (Thomas Spudich), Penn State Behrend, School of Science - Chemistry

An acousto-optic device has been successfully integrated into an atomic emission system for use with background correction in the 400-700nm region of the spectrum (ref. 1). A second acousto-optic background correction system has been built and will focus on the 200-400 region where more useful atomic emissions are found. By using acousto-optic diffraction, it is possible to increase the signal-to-noise ratio by reducing 1/f noise (ref. 2). The AO diffraction can be used to monitor the analytical and background signal in a near simultaneous fashion by using a square wave to turn the AOD on and off very quickly. Subtracting the background signal from the analytical signal allows for more accurate data. The system has already been used to successfully achieve diffraction with a helium-neon laser (632.8nm) and a mercury lamp (546.1 and 360nm). Once the system has been set for optimum diffraction efficiency, it will be used with an excitation source (such as an MIP) and will focus on analysis of metals such as iron, chromium, and zinc.

The Design, Characterization and Use of Reverse Osmosis as a Method of On-line Preconcentration

Christopher K. Won (Thomas Spudich), Penn State Behrend, School of Science - Chemistry

A transparent plexiglass block has been designed, housing two semi-permeable steel membranes along with a cellulose acetate membrane, to act as the reverse osmosis (RO) block for this project as well as providing the added option of video capture of the RO process. Reverse osmosis is carried out via an applied pressure greater than the osmotic pressure, which opposes the favorable concentration gradient. Stainless steel tubing, capable of withstanding pressures exceeding 800 psi, was used to connect the Gilson pump to the RO block and from the block to the exit valves and pressure gauge. The pressure produced from the Gilson pump supplied the drive to selectively separate the ions present in the solutions. The respective flow rates were documented for the drain and concentrate valves. These data supplied evidence to determine the reproducibility of the RO apparatus as well as the concentration factors relative to both valves. The first solution introduced into the RO apparatus was a 1 ppm (part per million) Na+ solution, in which drain and concentrated samples were collected and analyzed by emission spectrometry. This first trial yielded results that were not consistent with the flow rate data. To test the overall hypothesis, a larger K+ ion was used as a second trial solution at a more dilute concentration of 500 ppb (parts per billion). This project shows promising results and feasibility in real world applications such as in food administrations and purification companies. A successful conclusion to this project can lead to a novel, complementary device in which ultra-trace elements are can be detected in the ppb range.

THE APPLICATION OF RANS SIMULATION TO THE PREDICTION OF BLOCKAGE EFFECTS ON LIFT AND DRAG

Eric J. Dolak (William Lasher), Penn State Behrend, School of Engineering and Engineering Technology - Mechanical Engineering

This research was designed to test the ability of a numerical RANS (Reynolds Averaged Navier Stokes) computer simulation to predict the effects of blockage (the effect of the wind tunnel’s walls on flow patterns) on lift and drag coefficients. A quarter cylinder arc was modeled in FIDAP (a RANS computer code), and the results were compared with experimental data collected from wind tunnel testing. Four blockage ratios (the ratio of the arc radius to the distance between the top and bottom walls of the wind tunnel) were modeled: 0.27586, 0.2, 0.1, and 0.041667. Two approaches of RANS simulation were investigated: transient and quasi-steady. In addition to running four different blockage ratios, three different mesh schemes were also used: a base mesh, a halved mesh, and a doubled mesh. Using Richardson Extrapolation, mathematical truncation error due to mesh density was estimated to be on the order of 1% when comparing the base and double meshes, and on the order of about 5% when comparing the base mesh and the half mesh. The quasi-steady models consistently under-predicted values found experimentally by a percentage between 36-37% and 40-50% for the drag and lift coefficients, respectively. The large difference in the force coefficients is believed to be due to the fact that quasi-steady models do not predict the existence of vortex shedding, which is expected physically. At this time, the transient computations have not been completed. It is expected that these transient calculations will be more accurate based on the their ability to detect vortex shedding.

LINK MARGIN EFFECTS FOR AN S-BAND COMMUNICATION SYSTEM DUE TO LOSSY MEDIA

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The link margin effects due to various lossy materials (snow, water, coal, etc.) were determined for an S-band communication system. Mathematical models were developed, depicting bit error rate and signal-to-noise ratios for uniform heights of matter positioned on a transmitting antenna.

ARE GENDER ROLES AND ACHIEVEMENT GOALS OF COLLEGE STUDENTS REFLECTED IN THEIR DREAM CONTENT?

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Dream research (Cartwright, 1974) demonstrates that most dreams are about events that happen in our daily activities. The purpose of our research was to investigate whether achievement motivation is reflected in upper and lower class students’ dream content. Students kept a journal of their dreams for a period of two weeks. Our dependent measure was the proportion of dreams for each participant that showed a key behavior (e.g. taking a test), and the independent measures were sex and semester standing. We found that most students in college tended to dream about similar events regardless of their semester standing.

THE EFFECTS OF PRINT MEDIA ON THE “IDEAL” BODY IMAGE OF COLLEGE WOMEN

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The impact of media on body image has been consistently debated in literature. Most researchers have found that even brief exposure to the “ideal” body image in the media affects women’s views of themselves. We tested the hypothesis that women portrayed in print media negatively affect body images of female viewers. Female college students were shown pictures of either thin or obese models. They then completed the Body Image Identification Test to represent their ideal body image. We then measured height and weight to obtain their true image. We will present data to test the hypothesis that those students who saw the thin models should rate themselves as more obese than the students who saw the obese models. Thus, our hypothesis would be supported if the viewing of selected magazine media affects the way college women view themselves, physically and emotionally.

THE EFFECT OF DISTINCTIVENESS ON THE RECOGNITION OF FACES IN A LINEUP

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Unconscious transference occurs when an eyewitness to a crime misidentifies a familiar but innocent person from a police lineup. In the present study we propose that this effect may be moderated by the distinctiveness of the faces at the crime scene. A distinct perpetrator may be accurately remembered, and a distinct bystander may be misidentified as the perpetrator. Across conditions subjects were shown a picture of a crime scene that consisted of either a distinct perpetrator and a non-distinct bystander or a non-distinct perpetrator and a distinct bystander. Subjects were then given two unrelated tasks that took approximately 30 minutes to complete. After completing these tasks, subjects were shown either a simultaneous or a sequential lineup of 6 faces – two from the crime scene photo and 4 previously unseen faces. The results showed that a distinct perpetrator was, in fact, remembered more accurately than a non-distinct perpetrator. However, a distinct bystander was not misidentified as the perpetrator more often than any other foil. Finally, we did not find a difference in accuracy between the two types of lineups, a finding that contradicts previous research.

ATTRIBUTIONAL STYLE, STRESS, AND FIRST-YEAR SEMINARS AS PREDICTORS OF FIRST-YEAR ADJUSTMENT AND COLLEGE SUCCESS

Amy S. Brown and Elizabeth M. Henry (Dawn Blasko), Penn State Behrend, School of Humanities and Social Sciences - Psychology

The impact of attributional style, stress, and first-year seminars on adjustment and first-year college success was investigated. The participants completed the Attributional Style Questionnaire, Student Adaptation to College Questionnaire, and the Perceived Stress Scale. Three groups of participants were in the study: students enrolled in a first-year seminar, students enrolled in a first-year interest group, and students not enrolled in either. We hypothesized that optimistic attributional style has a positive impact on adjustment and college success. First-year seminars and especially first-year interest groups may have a positive impact on college success by giving students a support system and someone who can help them when they encounter difficulties during their early college experience

## THE ROLE OF WORKING MEMORY CAPACITY IN TEST ANXIETY

Nathan Childs, John Learn, and Bob Wittman (Victoria Kazmerski), Penn State Behrend, School of Humanities and Social Sciences - Psychology

We are investigating the ability that working memory capacity has in predicting test anxiety. Test anxiety has been shown to occupy sufficient portions of the working memory (Darke, 1988; Eysenck, 1985; Eysenck & Calvo, 1992; Ikeda, 1996). Previous research has not investigated the role of working memory capacity as a predictor of test anxiety. We measured anxiety levels during a task that occupies increasing levels of the working memory capacity. We theorize that as the amount of reserve working memory capacity decreases, the less able the subject will be to effectively cope with real and perceived stressors, resulting in an anxiety response. Individuals with a low working memory capacity have significantly less processing resources to utilize during an evaluative situation, whereas an individual with a large working memory capacity will have sufficient capacity to devote to the task. We hypothesized that the working memory capacity is a valid predictor of test anxiety, as shown by regression, and that anxiety will increase, as measured by self-reported anxiety and physiological response, as reserve working memory capacity diminishes.

# ERP INDICES OF INTERFERENCE IN A STROOP-LIKE SPATIAL TASK

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The Stroop task (Stroop, 1935) measures response delay that results from the competition between color and word meaning. The present study used a Stroop-like spatial task. In this study, event-related brain potentials (ERPs) were recorded as participants responded either to the position or meaning of the words “above” and “below” when they were placed above or below a centralized plus sign. The behavioral data (accuracy and reaction time) and ERPs from 48 participants were analyzed. We hypothesized that the incongruent condition (when meaning and position did not match) would have slower and less accurate responses than the congruent condition. The results of the ERP analysis will allow us to investigate both the locus and time course of interference effects in the brain.

**DOES FAMILY SIZE RELATE TO OBSERVED AND SELF-REPORTED LEVELS OF SHYNESS?**

Amy L. Hardesty and Christy E. Taylor (Dawn Blasko), Penn State Behrend, School of Humanities and Social Sciences - Psychology

Research has shown that social skills are first developed within the family. Birth order research has long been used to categorize personality traits corresponding with different positions in the family. The subtlety of birth order research findings prompted us to look at the variable of family size as a predictor of shyness. This study was designed to examine the possible relationship between family size and observable shyness and self-report shyness. Participants (N=50) were asked to complete the Revised Cheek and Buss Shyness Scale (1983) and were observed during a social interaction with the experimenter. The purpose of our procedures was to induce a state of arousal, which for some may result in shyness, by requiring participants to initiate conversation with the experimenter. The results showed no statistically significant correlation between the family size variable, the Revised Cheek and Buss Shyness (1983) scores, and observed shyness behaviors.

**THE JUSTIFICATION OF RELATIONAL AGGRESSIVE ACTIONS**

Elizabeth Oslak, Ashley Newhouse, and Penny Przybylski (Dawn Blasko), Penn State Behrend, School of Humanities and Social Sciences - Psychology

Research dealing with relational aggression has focused on pre-school and school-aged children and found girls to be more aggressive than males. The purpose of the present research was to investigate, in college students, triggering factors of relational aggression with scenarios. Two experiments that varied in circumstances were conducted to find how participants rated a scene of relational aggression. The design of our study was a 2 X 2 between subjects ANOVA. Our independent variables were intimacy of friendship (Experiment 1) and perceived popularity (Experiment 2). In both experiments, the dependent variable was how justified participants found the behavior in the scenario. Control variables included the scene of the situation and the type of relational aggression used. The results yielded no significance of intimacy of friendship or perceived popularity. Consistent results were found in both experiments when participants were asked what they would do in the situation.

GENDER DIFFERENCES IN RESPONSE TO DIFFERENT TYPES OF EROTIC VIDEOS

Staci Shawgo, Jonna Zizak, and Kristy Olson (Victoria Kazmerski), Penn State Behrend, School of Humanities and Social Sciences - Psychology

The purpose of this study was to examine the gender differences in response to two types of erotic videos. The sample consisted of college students from Penn State Erie, The Behrend College. Responses to the videos were measured by a questionnaire that was administered after each of the erotic videos. There were also several pulse rates taken throughout the duration of the sessions to measure the participants’ physiological responses to the videos. It was anticipated that the females would be more aroused by the romantic videos, where males would be more aroused by the explicit videos. Another variable examined was the gender differences in the guilt/shame rate of the participants. We believed the more guilt/shame, the less aroused a participant would be. The results were analyzed by ANOVAs and Pearson correlations.

# IMPROVING MENTAL ROTATION: INFLUENCE OF COLOR AND PERSPECTIVE

Jessica Turos and Amanda Ervin (Dawn Blasko and Kathy Holliday-Darr), Penn State Behrend, Schools of Humanities and Social Science and Engineering and Engineering Technology - Psychology

Spatial skills are extremely important in many careers including engineering. Research on mental imagery has shown that several of the component spatial skills can be improved by training. Our research is an initial investigation of the conditions that will improve performance of one such spatial skill, mental rotation. There are several tests designed to assess spatial skills. However, we were unable to find any existing software that both assessed and improved specific areas of spatial skill. We are currently programming a series of experiments using the E-Prime system to test and train male and female students’ mental rotation ability under four different conditions: 1) image in color, 2) image in black and white, 3) graphics in perspective, 4 ) no perspective. The data will be used to determine the conditions under which training will produce maximal improvement. The results from this testing will be used in the design of a Web-based training program.

# THE ATMOSPHERICS OF ONLINE MARKETING

Anna M. Zielinski and Edyta I. Stadnik (Dawn Blasko and Mary Beth Pinto), Penn State Behrend, Schools of Humanities and Social Sciences and Business - Psychology and Marketing

This study examined whether the atmospherics of a Web page (e.g. colors, fonts, graphics) are an important factor for online marketing. The participants were 14 males and 28 females. They saw Web pages that varied along three independent variables: page scrolling (yes, no), graphics density (high, low) and background color (white, orange). We used a mixed factorial experimental design. Scrolling and graphic were measured within subjects and background color between subjects. After viewing the pages, subjects were asked to rate the pages on how much they liked the page and if they would return. The results showed that when the page used scrolling and had a high intensity of graphics, participants spend more time on the page and liked it more.