The Undergraduate Research Forum is part of REACH (Research-Enriched Academic Challenge), a campus-wide program for undergraduates coordinated by the Office of Research Development and Administration. For more information, see “Student Research” on the ORDA web site (www.siu.edu/orda), or contact Dr. Karen Renzaglia at 453-4549 or renzaglia@plant.siu.edu.

The forum is being held in conjunction with the 2002 Research Day (sponsored by Phi Delta Kappa, Phi Kappa Phi, Sigma Xi, and the Society for Neuroscience) and the Illinois Junior Science and Humanities Symposium.
Undergraduate Research Forum
March 25, 2002
Southern Illinois University Carbondale

Program
Poster session, 1:00 - 5:00 p.m.
Award presentations, 4:00 p.m.
   — Outstanding posters
   — 2003 Undergraduate Research/Creative Activity Awards

Organizers
Karen Renzaglia, ORDA
Dena Stogsdill, ORDA
Marilyn Davis, ORDA

Sponsors
Office of the Provost
Office of Research Development and Administration (ORDA)

Poster Judges
Jim Allen, History
John Bozzola, IMAGE Facility/Plant Biology
Brooks Burr, Zoology
Peter Chametzky, Art and Design
Paula Davis, Rehabilitation Institute
Scott Hodgson, Radio/TV
Jodi Huggenvik, Physiology
Andrew Lumpe, Curriculum and Instruction

Special Thanks
Prudence M. Rice
Margaret Winters
Linda Martin
**STUDENT PARTICIPANTS / MENTORS**

Joshua Aaron ......................... Andrzej Bartke
Erin Aholt .............................. Peggy Stockdale, David Gilbert
Jason Arnold ........................... David DiLalla
Naomi Arseneau and
  Chandra Ewell ........................ Jane Workman
Pieter Badenhorst ..................... David Gibson, Andrew Wood,
  Youngkoo Cho, Bryan Young
Joshua Beckmann ...................... Michael Young, Michelle Ellefson
Douglas Bigham ....................... David Anthony
Meagan Bugle ............................ Jane Swanson
Leslie Centeno ........................ Stephanie Dollinger
Sandie Cheung ........................ Bakul Dave
Carrie Corso and
  Erin Polczynski ....................... Cathryn Studak
Rachel Crowell ....................... Mary Louise Cashel
Steve Dohrman ........................ Kambiz Farhang, Greg Moroz
Lester Ellis ............................. Marc Riedel
Barry Engelhardt ...................... David Gilbert, Stephanie Dollinger
Meghan Sarah Fidler .................. E. A. Jacobs, Stephanie Dollinger
Luis Gavino ............................. Blaine Bartholomew
Arlena Hamby ........................... Kimberly Espy
April Irons ............................. Usha Lakshmanan
Ron Jenkins ............................. Lichang Wang
Gwena Johnson ........................ Meera Komarraju
Scott LaFond .......................... Stephen Dollinger
Evana Lemke ............................. Diane Muzio
Renee Lopez-Smith .................... Karen Renzaglia
Jennifer Marcus ....................... Lisabeth DiLalla
Dimitra Palaskonis .................... Stephen Dollinger
Shayne Parks .......................... Marc Riedel
Bill Phillips ........................... Beth Middleton
Jeffrey Russell ........................ Alan Walters
Nicole Sawatzki ....................... Michael Young
Phillip Szymcek ...................... Scott Ishman
Adam Trammel ......................... Stuart Adler
Sarah Turner .......................... Douglas Smith, Rodney Roosevelt
Heather Westfall ...................... Joel Feldman
Misty Wittenborn ..................... Mary Louise Cashel

**Corso, Carrie; Polczynski, Erin**

Department of Workforce Education and Development

**Content Analysis of Job Advertisements for Corporate Retail Buyers**

The purpose of this study was to conduct a content analysis of advertisements placed in a select trade publication. Emphasis was placed on how computer skills were described as necessary for job candidacy for fashion retail buying positions. The job responsibilities of buyers have changed tremendously since the 1990s due to mergers of independently owned retailers with national parent retail corporations. Sole proprietorships typically have annual sales volumes of less than $1 million with 1-3 locations. Parent retail corporations own hundreds of stores throughout the nation. They are dependent on computer software systems to manage product distribution, quick response inventory management systems, vendor sourcing, and daily sales analyses.

The results of this research revealed that computer skills required for viable job candidates included advanced level spreadsheet skills, with Microsoft Excel as the leading software program named as a position requirement. Entry-level buying positions most often cited specific software programs for job candidacy. For senior-level buying positions, the ads cited computer skills without a specific software reference. However, two other skills were mentioned, ranking in equal importance to computer skills: negotiation skills and communications skills. A surprise finding of this study involved manufacturers’ advertisements for merchandising positions. These ads consistently required individuals to have at least two years of corporate retail buying experience. The implications for this study enforce the importance of professional skill development with spreadsheet software as part of a fashion merchandising curriculum.
Irons, April

This Here Paper is About These Here Determiners and Prepositions

While thinking of a topic for my paper in my syntax class (LING 408 - Syntactic Theory), I noticed an odd grammatical structure in my own English. I am from this area, DeSoto to be precise, and in Southern Illinois we have this phrase that involves determiners and prepositions. This phrase is grammatically incorrect in Standard English, but I wanted to explore the grammar behind this phrase in the Southern Illinois English dialect. In Southern Illinois, it is perfectly grammatical to say, “this here book.” In fact, this is a common determiner phrase in my dialect.

After exploring this phenomenon under the framework of the Minimalist Program, I came to certain conclusions that I will demonstrate. First, I will demonstrate that “here” and “there” (the only prepositions ever used in these phrases) are indeed still prepositions in these phrases. Second, I will demonstrate the internal structure of these phrases, with focus on the types of lexical elements, the linear ordering and the hierarchical structure. Third, I will demonstrate the restrictions on determiner and preposition selection. Only certain determiners can be used with certain prepositions. I will finally explain the cross-linguistic links between the Southern Illinois English Dialect and other, non-European languages. And by using these links, I will argue for a new feature needed to adequately describe these languages. This feature is “proximity,” and I will explain its use and importance to the field of syntax.

Sawatzki, Nicole; Young, Michael E.

Variety Perception and Choice Behavior in College Students

Sixty undergraduate students enrolled in an introductory psychology course at SIUC voluntarily participated in this study. The participants included 19 males and 39 females. The experimenter administered a packet that contained two questionnaires and stimuli consisting of two different lists of university course offerings.

One of the stimuli, Jones State University (or Smith State University, depending on which condition), contained a list of organized course offerings. All of the courses were grouped together by topic and then organized by levels. For example, all of the psychobiology courses were together with an introductory, intermediate, and advanced level (e.g., Introduction to Psychobiology, Psychobiology: Brain and Behavior, Advanced Psychobiology: Neuroscience). The other stimuli contained course offerings that were disorganized.

After the participants were exposed to the stimuli, they were asked to answer some questions about the university courses. Finally, the participants were given a questionnaire that contained demographic data.

Wasserman, Young and Nolan (2000) believe that organization effects are due to the existence of a small, selective attention field. Although pigeons can judge entropy, the items being judged have to fall into the attention field. My hypothesis was that participants would deem the disorganized course listing as having more variety than the organized course listing.

The results indicated that the participants perceived more variety in the organized course listings, and preferred the organized course listings over the disorganized course listings. In conclusion, if universities organize their course listings it may result in increased student interest and potentially increase course enrollment.
**Autistic Behavior Modification Techniques**

By surveying professionals who work with children with autism, one can discover which techniques are most effective in modifying certain autistic behaviors. In order to do this, open-ended, preliminary questionnaires were sent to 10 professionals working in schools in Illinois. The questionnaire asked the respondents to list three ways in which they modified immediate echolalia, delayed echolalia, ritualistic behavior, self-initiated isolation, failure to accept change in routine, hypersensitivity to touch, manipulation of digits, hand flapping, head banging, and biting.

Seven professionals responded, which gave me a list of modification techniques currently being employed. An expanded questionnaire was developed using the respondents' answers from the preliminary questionnaire. This questionnaire listed 6-9 modification techniques under each autistic behavior. The respondents indicated the top three techniques they employ by ranking them with the numbers 1, 2, 3. An additional question asked the respondents if they employ sensory activities prior to instruction (e.g., exercise, music, bouncing) intended to reduce self-stimulating behaviors and what effect those activities have on self-stimulating behaviors. Seventy of the 157 questionnaires sent to professionals working in schools in Illinois were returned.

The information provided by this research will be most beneficial to professionals with little or no experience with children with autism. When professionals know what techniques work for other professionals, they can begin to modify the behaviors more effectively. Knowing that modeling the appropriate response for delayed and immediate echolalia or that redirecting a child for head banging or ritualistic behavior are effective techniques used by professionals in my survey could make all the difference in a professional’s career and a child’s life.

**Growth Hormone Signaling, Antioxidant Enzymes, and Longevity**

The role of growth hormone (GH) in the aging process is controversial in whether it promotes or delays aging. The purpose of this study was to determine the effects of GH signaling on oxidative processes in long-living GH receptor knock-out (GHR-KO) mice and Ames dwarf mice. Therefore, GH or insulin-like growth factor (IGF-I) replacement was administered to determine whether altered GH signaling in these animals may be responsible for improved antioxidant protection. Antioxidant enzymes are believed to have a positive effect on longevity by scavenging harmful free radicals in the body. Activity of antioxidant enzymes Cu/Zn superoxide dismutase (SOD), catalase (CAT), and glutathione peroxidase (GPx), as well as free radical damage of lipids were measured in the kidney and liver.

Our results indicate GPx was increased and SOD decreased in the kidney of GHR-KO as compared to normal mice, while the liver showed decreased SOD. IGF-I administration reversed the change in GPx and reduced the activity of CAT in the kidney of GHR-KO mice, but it caused a further suppression of SOD activity in the liver. Dwarf mice had decreased levels of SOD and GPx in the kidney and these changes were not altered by GH administration. In the liver SOD and GPx were increased, and GH administration increased CAT.

The present results are not consistent with the suspected role of GH signaling in stimulating antioxidant defenses. However, administration of IGF-I to the GHR-KO mice reversed some of the changes in antioxidant enzymes in the kidney. Furthermore, the effects of GH deficiency or resistance on longevity cannot be readily explained by improved free radical scavenging.

Further research will be needed to characterize the oxidative processes throughout the life span of long-lived mice and to identify mechanisms responsible for longevity.
Crowell, Rachel
Department of Psychology

The Relation Between Interparental Conflict and Juvenile Delinquency

The study examines the relation between interparental conflict and delinquency among adolescents. The sample will include two age groups: at least 50 adolescents between 13 and 17 years of age, and at least 50 older adolescents between 18 and 21 years of age. The participants are completing a web-based questionnaire comprised of The Children's Perception of Interparental Conflict Scale (Grych, Seid, & Fincham, 1992) and The Self-Reported Delinquency Measure (Elliot & Agnew, 1980).

The following hypotheses are being evaluated: (1) adolescents reporting high levels of parental conflict will also report greater involvement in delinquent activities; (2) adolescents from divorced families with low levels of parental conflict will report less involvement in delinquent acts than those in intact families with high levels of conflict; and (3) adolescents from intact families reporting low levels of parental conflict will have the least reported involvement in delinquent activities.

Cheung, Sandie H.; Dave, Bakul C.
Department of Chemistry and Biochemistry

Metal-Binding Glasses: Selective Tuning of Binding Affinity by Ligand Variation

A new class of sol-gel–derived composite materials containing thiol (-SH) and amine (-NH₂) ligating groups, capable of exhibiting metal-binding interactions with high selectivity for toxic metal ions, have been synthesized and evaluated for their removal from water. These silica sol-gel materials exhibit high affinity for binding toxic metals like mercury (Hg²⁺), cadmium (Cd²⁺), and lead (Pb²⁺). The evaluation of metal binding capacity of these materials has been determined as a function of: (a) metal ion concentration, (b) ligand variation, and (c) selectivity of the material for the toxic metal ions in the presence of other commonly existing ions such as sodium, magnesium, and calcium. The effectiveness of metal-binding by the material has been determined with AES measurements, and further evidence of metal-ligand interactions was obtained with TEM and FTIR data.

In addition, the selective choice of the ligating groups has resulted in the materials being reusable. The pH sensitivity of the amine (-NH₂) and thiol (-SH) groups in the silica framework has been used to release the metal ions from the material to create a system that is capable of absorbing another set of metal ions.

The results obtained have shown an exceptionally high efficiency for removal of Hg²⁺, Cd²⁺, and Pb²⁺ ions from aqueous solutions. More than 95% of these toxic metal ions were found to be removed from the solutions, with almost 100% reusability of the material. Overall, we have demonstrated that it is possible to tailor these sol-gels by varying the composition and nature of ligands to control the metal-binding affinity of the material. The potential industrial application of these materials may include removal of toxic metal ions from contaminated waste waters.
Szymcek, Phillip
Department of Geology

*Modern Foraminiferal Distributions within the Former Larsen Ice Shelf-A and Prince Gustav Channel, Antarctica*

Surface sediment samples collected from the former Larsen Ice Shelf-A (LIS-A) and the Prince Gustav Channel (PGC), eastern Antarctic Peninsula, were analyzed for benthic and planktic foraminifera. Live (stained) and dead (unstained) assemblages were compared to identify the Potential Fossil Assemblage (PFA). Cluster analysis was used to determine species distribution in these areas. Distinct trends in foraminiferal biofacies are noted from the Larsen Ice Shelf-B (LIS-B) edge northward to the PGC. Four distinct biofacies were defined. The agglutinated species *Adercotrymata glomerata*, *Reophax* spp., *Portatrochammina* spp., *Textularia weisneri*, and *T. antarctica* occur throughout the LIS-A and PGC. The Greenpeace Trough and its periphery contain a biofacies defined by abundant *Nonionella* spp., *Globocassidulina biora*, and *Epistominella exigua*. A biofacies defined by *Trifarina* spp., *Uvigerina* spp., and an abundance of planktic foraminifers, including *Neogloboquadina pachyderma*, is closely associated with the northern margin of the LIS-B. These two biofacies overlap near the southern boundary of the Greenpeace Trough. The northern extent of the former LIS-A region is defined by a primarily agglutinated biofacies containing a lower diversity of calcareous species than other LIS-A regions. *Portatrochammina* spp., *Textularia weisneri*, and *Epistominella exigua* are prevalent in this biofacies. The PGC biofacies is defined by agglutinated foraminifers that include *Textularia weisneri*, *Portatrochammina* spp., *Miliammina* spp., and *Reophax* spp. Planktic foraminifers were sparse in the PGC samples in comparison to the LIS-A samples; however, they were more abundant in an area influenced by an outlet glacier. These results indicate that foraminiferal species distributions are controlled by glacial and bathymetric conditions within the Larsen Ice Shelf-A and Prince Gustav Channel region of the eastern Antarctic Peninsula.

Ellis, Lester C.
Crime Study Center - Administration of Justice Program

*Homicide: The Dual Aspects*

Every year the FBI publishes data on crime statistics known as the Uniform Crime Reports. These UCR statistics are subject to error. Problems with the Uniform Crime Reports include the methodology and the inconsistency of audit checks in the system, to name two. This results in an inadequate understanding of crime in our nation. These statistics are used by criminologists, politicians, students, and others who wish to understand crime in our society. The relevance of accuracy is mandated in order to form better policies to protect our citizens from crime. This report will access the strengths, and mostly the weaknesses, of the UCR’s interpretation of homicide by using a data set compiled in California for 1990–1999 on homicides by counties. This data set includes data on vital statistics, which also keeps track of homicides. In this project I intend to show that the discrepancies in uniformity necessitate change in the way our nation compiles such important statistics.
The Feature Positive Effect in a Serial Learning Task

A feature positive discrimination involves learning that a positive outcome is associated with the presence of a distinctive feature. A feature negative discrimination involves learning that a positive outcome is associated with the absence of a distinctive feature. In studies involving pigeons, Jenkins and Sainsbury (1969, 1970) observed that a feature positive discrimination was easier to learn than a feature negative discrimination—the "feature positive effect."

We designed this experiment to find out if the feature positive effect exists in a serial learning task involving adults. Undergraduate psychology majors who were enrolled in Introductory Psychology served as participants. Serial feature positive and serial feature negative discrimination tasks were created with the novel use of movie stimuli to represent more realistic events that unfold over time. Six different two-second movies were used to create six different serial learning trials (AB+/B-, CD-/D+, XY+/XY- where A, B, etc., each represent a different movie, “+” represents a positive outcome, and “-” represents the non-occurrence of the positive outcome) that were used in three different conditions, Simultaneous, Serial 1, and Serial 2. These conditions each involved different orderings of the movies within a trial (e.g., A↑B, B↑A, or A&B).

It was our hypothesis that the feature positive discrimination (A↑B+ vs. B-) would be easier than the feature negative discrimination (C↑D- vs. D+), thus creating a feature positive effect in all conditions. The initial data indicated that a feature positive effect was present in both the Simultaneous and Serial 2 conditions but no feature positive effect was found in Serial 1 condition. These differences across conditions may be mediated by memory effects and thus constrain theoretical interpretations of the feature positive effect.
Wittenborn, Misty

Department of Psychology

The Relation Between Parenting Styles and Juvenile Delinquency

This study seeks to evaluate the relationship between Diana Baumrind’s (1971) parenting styles and juvenile delinquency. The Parental Authority Questionnaire (Buri, 1991) was used to assess parenting style. The Self Reported Delinquency Survey (Elliot & Ageton, 1980) was used to determine levels of delinquency in adolescents. We anticipate at least 100 participants between the ages of 13 and 21. The participants will be asked to fill out the questionnaires on the Internet. The data will be saved online, and will be analyzed using correlational and multivariate procedures.

We hypothesize that the permissive parenting styles will be highly correlated with high scores of delinquency. It is also thought that the authoritative parenting style will be related to low scores of delinquency. Finally, mean difference in delinquency scores from groups defined by parenting style will be evaluated. There are no results at this time. Data is currently being collected for this project.

Centeno, Leslie

Department of Psychology

Creativity and Identity Development

This study was designed to examine how identity development is related to measures of past creative accomplishments, current creative products, divergent thinking and creative potential, based on Erik Erikson’s concept of identity. The three identity styles are: Informative, which involves actively searching for, elaborating, and evaluating issue-relevant information; Normative, which focuses on internalized conventions, standards, and expectations; and Diffuse, which is characterized by avoiding or procrastinating until the affective cues in a given situation dictate behavioral reactions (Berzonsky, 1989).

The measures included Berzonsky’s Identity Styles Inventory (ISI), Hocevar’s Creative Behavior Inventory (CBI), Gough’s Adjective Check List Creative Personality Scale (CPS), and the test of Creative Thinking - Drawing Production (TCT-DP) (Urban, 1991). Subjects were 94 undergraduate students, majors and non-majors, from an introductory psychology course (Psychology 102) and a 300-level Adolescent and Young Adulthood Psychology course (Psychology 303).

The findings suggest that informative identity style positively correlates high to creativity. Participants with this style were more likely to be open and seek information to further their creativity. Normative identity style positively correlates to creativity. Participants with this style were creative; however, they were less open to new creative information and ideas. Diffused identity style positively correlates low to creativity. Participants with this style were not likely to be open or to seek ways to be creative.
Arnold, Jason
Department of Psychology

Familiality and Its Relationship to Affective Disorders

The purpose of this study is to examine the relationship between familiality and affective disorders. Studies indicate that people with affective disorders such as depression and bipolar disorder have a higher than expected rate of affective disorders in their families. The main type of affective disorder to be examined will be depression. Approximately 100 participants will be used for this study; these participants will be students as well as family members nominated for participation by the students. Student participants will be recruited through flyers posted around academic buildings on the SIUC campus. Additionally, students will be recruited from Introductory Psychology classes offered at the University.

Three questionnaires will be given to assess three areas: depressive symptoms, personality traits, and family history. Participants who manifest more symptoms of depression will be examined to see if there are higher instances of depression in their families as compared to participants who have fewer symptoms of depression. Data from the higher-scoring participants and lower-scoring participants and their family participants will be correlated. It is expected that participants with higher levels of depression will have significantly higher numbers of family members with depression and histories of affective disorders compared to low-level participants who do not.

Westfall, Heather
School of Art and Design

Woodcut Process and Landscape Study: An Exploration of Printmaking and the Drawn and Painted Surface

My objective is to study the processes and techniques of woodcutting in comparison with those of painting and drawing, and to investigate new types of two-dimensional surfaces appropriate for my work. My research has focused on the rural landscapes near my home. I have collected both sketches and photographic imagery of these landscapes, which I use in forming images based both in reality and in the imagination. The process of developing a working dialogue between both painting and printmaking style is a priority, as well as understanding how the different mediums inform each other. I have produced woodcut prints on paper as well as large-scale charcoal drawings in which the focus is the visual texture and spatial concepts created by both the printed and drawn line. In contemporary art there is an emphasis on combining media for their different qualities. In my own work, modes of representation and abstraction play an important role. The woodcut prints and the drawings both emphasize the importance of structure in landscape, as well as the construction of a space and forms created by the buildup of line. In my research, I have found that both media are important in their own way, as well as in the ways they combine together.
Gavino, Luis
Department of Chemistry and Biochemistry

Overexpression of Recombinant Histones via Escherichia coli for Chromatin Remodeling Research

It is well known that DNA is replicated and transcribed to make life. Although the general mechanics of these processes are well known, the finer details of this complicated process still remain a mystery. Many scientists have studied prokaryotic and eukaryotic systems in hopes of better understanding how and why genes are expressed.

DNA in eukaryotic species is very large and is packaged in chromosomes. DNA is a double helix composed of four bases—guanine, cytosine, thymine, and adenine, with adenine pairing with thymine and guanine pairing with cytosine. These four bases form the language that encodes for proteins to make blue eyes or brown hair. This double helix is further compacted by being wrapped around histone complexes, forming nucleosomes. These histone complexes are actually composed of eight proteins, creating a protein octamer. Chromosomes are composed of a series of these tightly wound nucleosomes.

The research team that I work with seeks to find out how replication or transcriptional machinery is able to get at the DNA. My specific research was to overexpress four mutant frog (Xenopus laevis) histones via a protein overexpression vector plasmid in Escherichia coli. These mutant histones are either missing or have an extra cysteine residue. This residue will be used for radioactive affinity labeling to see how the SWI/SNF chromatin remodeling complex will reconfigure the nucleosome such that DNA is more accessible to transcriptional or replication machinery.

Russell, Jeffrey B.; Walters, S. Alan; and Bond, Jason P.
Department of Plant, Soil, and General Agriculture

Plant-Parasitic Nematodes Associated with Peach Production in Southern Illinois

Peaches are an important crop in Illinois, with an annual farm-gate value over five million dollars. There are many constraints that hinder peach production in Illinois; however, the influence of plant-parasitic nematodes on peach production is not known. A survey of peach orchards was conducted in 2000 and 2001 to determine the plant-parasitic nematodes that are associated with peach trees in southern Illinois. Eight genera of plant-parasitic nematodes, Helicotylenchus, Meloidogyne, Mesocriconema, Paratylenchus, Pratylenchus, Trichodorus, Tylenchorhynchus, and Xiphinema, were identified. Over the two growing seasons, populations of Mesocriconema and Xiphinema were found to be at the highest levels. Although Meloidogyne was found at low populations in a limited number of samples and has the potential to cause excessive damage to peach crops, it appears that Mesocriconema and Xiphinema have the greatest potential to affect production in southern Illinois.
Hamby, Arlena
Department of Psychology

Genetic, Perinatal, and Social Influences on Outcomes in Preterm Children at Risk for Learning and Attention Disorders

Researchers have made advancements in identification and classification of learning, attention, and behavioral disorders in school-age children. However, there remains a dearth of knowledge concerning the antecedents of such disorders during the preschool period. Children born preterm are at known risk for the subsequent development of learning, attention, and behavioral disorders. Studying the specific neuropsychological abilities that underlie these disorders, such as executive functioning, in at-risk preschool children will lead to identification prior to school entry. A multifactorial prediction model that includes genetic, perinatal, and social influences was used to investigate neuropsychological outcomes in preterm children. By examining the complex interactions among multiple determinants of cognition in at-risk children, the general developmental trajectories that lead to learning, attention, and behavioral disorders can be understood.

Bigham, Douglas S.
Departments of English and Linguistics

Speaking for Uncle Tom: Dialect Variation and the Construction of Identity in Uncle Tom’s Cabin and Its Adaptations

How we communicate with each other is second only to the fact that we can, indeed, communicate. It is through language that this ability is shared, expressed, and passed on, along with our cultural beliefs and traditions, all inherent to our conception of “self.” In dialect writing, then, an author can choose to construct characters—ideas, social class, humanity—through not only what is said, but how a character says it. In linguistics, an idea exists of linguistic determinism which, basically, states that a speaker’s worldview-mindset is dependent on how they use language, and a speaker’s language is likewise shaped by this worldview-mindset. So, when an author chooses to represent a character with specific dialectal features that vary from some assumed spoken standard, the author is commenting on how a character belongs, what that character’s place is in the human structure.

This project looks at how these dialectal differences are used in Uncle Tom’s Cabin and the numerous adaptations that have come about since its original publication. This project will show how, when working from an established standard (that of the original novel), an adaptation breaks down and reconstructs characters and characters’ identities though character voices, speech, and dialect.
Workman, Jane E.; Arseneau, Naomi; Ewell, Chandra; Young, Kristen
Department of Workforce Education

Ownership and Visibility of Alcohol Promotional Clothing Items

This study examined ownership and visibility of alcohol promotional clothing items (APCIs) and the association between APCI ownership and alcohol use. Exposure to alcohol advertising is positively correlated with adolescents’ alcohol use (Kohn & Smart, 1987). Promotional tactics of alcohol companies such as giving away t-shirts that advertise alcohol often target adolescent consumers, which raises a question: Is ownership of alcohol promotional clothing items related to alcohol use?

Procedures. Participants were university students (120 males; 106 females) who completed a questionnaire about demographics, alcohol use, ownership, and visibility of APCIs. Items from The American Drug and Alcohol Survey (RMBSI, 1994) and Sargent et al.’s (1997) survey of cigarette promotional items were adapted for use in this study.

Findings. Participants ranged in age from 18 to 51 (m=21.71); 53.3% were under 21; 219 (96.5%) had tried drinking alcohol. Nearly 40% of participants owned an APCI and 80% reported their friends owned APCIs. APCI ownership did not vary by sex or age group (under 21 v. 21 and older). Only 3.1% of participants reported wearing an APCI the day of the survey, but 52.4% reported seeing an APCI on campus that day. Chi square tests comparing alcohol use of students who owned APCIs with those who did not revealed significant differences (p < .000): those who owned APCIs were more likely to respond “more than 100” when asked how many drinks they had in their life and more likely to say that they would drink alcohol in the next two months, that they would drink at least once a week, and that they intended to drink in the future.

Implications. Alcohol promotional clothing items were prevalent and highly visible in the social environment of these university students. A relationship between ownership of APCIs and drinking was evidenced. Students send a powerful pro-drinking message to their peers by wearing APCIs.

Aholt, Erin
Department of Psychology

Lesbian Personality and Motivational Influences on Smoking

Studies have suggested that lesbians are significantly more prone to smoke than heterosexual women are. The Institute of Medicine has reported that twice as many lesbians as heterosexual women smoke cigarettes. To facilitate the development of effective, culturally appropriate antismoking programs for lesbians, the behavioral health characteristics leading lesbians to smoke need to be examined. Data are lacking for the lesbian community about what affects conscious motivation to smoke, desire to smoke, and probability of smoking in different situations. It is uncertain whether these compelling forces are the same for lesbians as for heterosexuals. Studies have been aimed at finding different patterns between smoking rates of heterosexual women and lesbians, but there is a lack of research on different motivational forces compelling lesbians to smoke. Previous literature has suggested possible causes, but has not used a theoretical scale in testing. Research on the etiology of cigarette smoking in younger lesbians is needed. The current study is aimed at doing so.

Through self-report questionnaires, the proposed study will define different aspects of personality and the various dimensions of temperament that relate to both the onset and the longer-lasting problems of tobacco use among lesbian smokers in comparison to lesbian nonsmokers. With these data, a more effective smoking intervention program can be developed and implemented in which health care administrators are knowledgeable about the differences in the lesbian culture and how to most successfully guarantee smoking cessation. The current study will test the following four hypotheses: (1) there is a lower correlation between smoking and desire for weight suppression than has been reported in studies of heterosexual women; (2) lesbian women scoring higher on psychoticism, impulsivity, and unsocialized sensation-seeking and lower on conscientiousness and agreeableness are more likely to have a greater degree of nicotine dependence; (3) depression is a predictor of smoking among lesbians; (4) lesbian women rating highest on the Gay Identity Questionnaire exhibit lower levels of neuroticism and impulsivity.
Engelhardt, Barry  
Department of Psychology  
*Illicit Drug Users, Chain Smokers and Binge Drinkers: The Relationship Between Personality and Drugs of Choice*

While numerous studies have been conducted in regard to personality constructs and the use of both licit and illicit psychoactive substances, little to no research has actually taken an active interest in determining an individual's drug preference. Instead, the majority of past research has chosen to focus on alcohol, multiple drug users, and users of a specific substance.

This study will survey 130 high school and college students in Southern Illinois. The students will be asked to rank-order a list of nine psychoactive substances that are widely used, as well as complete the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ), (Zuckerman, Kuhlman, Joireman, Teta & Kraft 1993), the Multidimensional Personality Rating Scale (MPRS) (Bushman 1996), the State and Trait Anxiety Inventory (STAI) (Keyser & Sweetland 1984), the Family Events and Health Questionnaire (Gilbert), and the Core Alcohol and Drug Survey (Presley 1989).

It is expected that psychoactive substance preferences and consumption will be related to personality traits. Specifically, individuals who prefer licit drugs will have significant differences in personality constructs than those who prefer illicit substances, and individuals who choose an illicit substance as their psychoactive drug of choice will score higher on impulsive sensation seeking and neuroticism. It is also expected that individuals who prefer different illicit drugs will have specific differences in regard to the 12 subgroups of the MPRS. This will also be true of individuals who prefer different licit substances.

Turner, Sarah; Roosevelt, Rodney; Smith, Douglas  
Department of Physiology  
*Exploring the Effects of and a Possible Treatment for Edema in the Injured Brain*

Cerebral edema, or the swelling of brain tissue, is a common effect of traumatic brain injury (TBI). Edema can develop within minutes of TBI and become more severe over a period of days, increasing the amount of brain tissue afflicted. In humans, behavioral deficits attributed to cortical lesions include poor spatial working memory, impaired response inhibition, reduced behavioral spontaneity, and impaired spatial orientation. In preliminary studies, the administration of ibuprofen, vitamin C, and vitamin E has effectively improved lab rats' recovery of motor skills following TBI. This study was designed to determine if the neuroprotective effects of the aforementioned treatment are derived from a reduction in edema formation.

Rats were divided into three groups—experimentals, uninjured shams, and injured vehicle controls. Ibuprofen, vitamin C, and vitamin E were injected into the experimental group 30 minutes post-injury. All rats had their brains extracted for water weight analysis 24 hours after the completion of surgery. The results of this study show a correlation between the TBI-induced duration of unconsciousness and hippocampal edema. More subjects will be needed to establish the effectiveness of ibuprofen, vitamin C, and vitamin E in reducing the onset of edema.
Little research has examined the influence of personality types on how an individual thinks, perceives, or understands dreams. The present research relies on Carl Jung's theory of dreams and its relation to psychological attitudes and functions. In the present study, dreams were collected and rated on dimensions of vividness, dreamlikeness, bizarre-ness, symbolism, and positivity. In keeping with the idea of Jung's psychological types, the Myers & Briggs Type Indicator (MBTI) was administered to examine the relationships between an individual's personality type and his/her experience with dreams. Differences in dream patterns and personality types were further investigated. The analyses presented will test whether those who access and report more vivid, dream-like, bizarre, and symbolic dreams are in fact intuitive-introverts.

The alkaloid trigonelline (TRG) is a conjugate of nicotinic acid, and is postulated to function as a compatible solute in response to salinity- and water deficit-stresses. We postulate that TRG can serve as a biochemical marker for interspecific plant competition between crops and weed species. To evaluate this hypothesis, selected soybean cultivars and the weed common waterhemp were grown under increasing weed densities in the field. Foliar TRG concentrations and several agronomic characteristics were determined and the results of the complete experiment will be discussed.

It was hypothesized that temperament would significantly predict school performance in late-elementary-school-aged children. Specifically, it was predicted that children with high temperament ratings of persistence would have increased school achievement and closer student-teacher relationships. Children with high ratings of the temperament variables activity and distractibility should exhibit lower academic achievement and more distant student-teacher relationships. All data will be collected and analyzed by March 2002. Using the information obtained in this study, we can better understand how temperament affects performance in a school setting. New programs can be implemented to better accommodate children with new classroom environments that utilize children's unique strengths for learning, according to their temperaments.
Trammel, Adam
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Superagonist Estrogenic Activity of Resveratrol Is Related to Cell Density or Growth Effects

Resveratrol has been widely studied for biological activities that may contribute to the health benefits associated with the consumption of grapes or red wine. Although resveratrol binds to both ERα and ERβ, its actions as an estrogen remain unclear, and several laboratories report differing results for both the degree to which resveratrol activates estrogen responsive genes, and whether resveratrol displays mixed antagonist or SERM activity. We have evaluated resveratrol’s function as an agonist or antagonist for gene activation using estrogen-responsive luciferase reporter genes. For gene activation, Hela cells were transfected with an estrogen responsive reporter gene and either ERα, ERβ, or a combination of the two.

Our results were initially puzzling, in that seemingly identical experiments produced two different sets of results. Either resveratrol behaved as an agonist with a lower affinity for ERs than estradiol but a similar degree of gene activation, or resveratrol behaved as a superagonist, achieving activity 2- to 3-fold or more greater than estradiol. These two distinctive sets of results were seen repeatedly and were similar for both ERα and ERβ. Intentional variation of many parameters of the experiment had no effect on these results. However, when cell density was altered, we could demonstrate both normal agonist activity at low seeding density or superagonist activity at high cell density within the same experiment, suggesting that cell growth or cellular signals dependent on cell density can dramatically alter the activity of resveratrol even within a single cell line.

These results raise a cautionary concern, particularly if they also pertain to other cell lines or tissues or if similar mechanisms may be used by other non-steroidal compounds. They raise the possibility of dramatic differences in estrogenic effects via ERα and ERβ in vivo, particularly during development or at other times of rapid growth, but at concentrations much lower than might be predicted from initial studies performed under conditions that do not promote superagonist effects.

LaFond, Scott
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Effects of Personality Traits and Emotion States on Affective Picture Ratings

In this study, extraversion, neuroticism, and state anxiety will be measured to study their effects upon subject’s self-ratings of affective pictures. Participants will be tested using the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) and the State-Trait Personality Inventory (STPI) (Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993; Spielberger, 1995) to find levels of trait as well as state neuroticism and extraversion. Following this they will complete a four-part series of computerized tasks that will require them to rate positive, neutral, and negative emotionally affective pictures from the International Affective Pictures Series (IAPS) on 9-point scales adapted with Self-Assessment Manikin (SAM) pictures (Lang, Bradley, & Cuthbert, 2001; Lang, 1980). The pictures will be rated on scales of positivity, negativity, valence, and interest. The results will test the hypothesis that high trait extraversion will correspond to more positive and less negative ratings of pictures. Conversely, high trait neuroticism will correlate highly with lower positive ratings and higher negative ratings of the same pictures. This study will also show that high state anxiety will produce similar results as trait neuroticism.
Comparisons Between Pre-Released and Swimming Sperm Cells of the Fern *Lygodium japonicum*

To identify structural modifications that accompany cell motility in plants, we compared mature pre-released sperm cells of *Lygodium japonicum* with cells that have been actively swimming. Anatomical changes between the two conditions were characterized in the transmission electron microscope and these were correlated with images taken in the light and scanning electron microscopes. Non-motile sperm cells still contained within the antheridium (male sex organ) are streamlined and coiled over three revolutions. The cylindrical nucleus is compacted and spirals along the cell length. Approximately 70 flagella are attached along the anterior-most coils. A band of microtubules encircles the coils, and numerous mitochondria and starch-filled plastids are positioned in a large cytoplasmic mass that fills the inner nuclear coils. Once released from the antheridium and upon motility, the cell stretches in length but exhibits no other major structural modifications except that the cytoplasmic mass may be shed. When the cell enters the viscous mucilage that is exuded by and surrounds the archegonium (female sex organ), the mass of excess cytoplasm, including plastids, is invariably eliminated. The only organelles remaining in sperm cells adjacent to the egg are those of the locomotory complex (including flagella), the nucleus, and numerous mitochondria.

These findings have important implications for fertilization and inheritance of DNA. Since no plastids are contained in the sperm cell at fertilization, then plastids cannot be contributed by the male but must be inherited exclusively from the female (in the egg). Conversely, the multiple mitochondria in sperm and egg cells at the time of fertilization indicate that mitochondria may be inherited from both.

Frame and Suspension Design of Southern Illinois University’s Formula SAE Race Car

The Formula SAE Racecar Competition is an engineering design event conducted annually by the Society of Automotive Engineers that attracts over 120 schools from around the world. The purpose of the competition is for students to gain practical hands-on knowledge of engineering with a strong emphasis on teamwork. Each team’s objective is to design and manufacture a formula style prototype race car that the average “weekend racer” can purchase and compete with on an autocross circuit. SIUC has participated in the competition since 1996 and our third vehicle is now almost complete for the race in May. Everything from the engine to the nuts and bolts was examined to improve safety, ergonomics, appearance, and performance of previous cars. Major design improvements include use of a round tube space-frame, which reduced the weight of the chassis by one-half, an adjustable drivetrain, and custom-molded seating for each individual driver. These features make our project safe for our entire team, which is diversified in height and stature. The team includes students majoring in engineering, business, industrial design (designed and manufactured the fiberglass body), and outdoor recreation.

This poster outlines the design of the frame and suspension parameters for this year’s car. Over 2,000 hours have been spent researching, designing, and manufacturing suspension and the tubular frame. Other designs and our previous cars were analyzed to determine how we could improve past implementations. Research of new materials and manufacturing methods has proven invaluable for improving safety and performance. The weight of the vehicle has been reduced 20%, while still maintaining a stiff structure. Computer Aided Modeling dramatically simplified design and manufacturing of this year’s car, allowing all team members to visualize the design and to easily make adjustments and accurately manufacture parts using Computer Aided Manufacturing. The real research—testing and implementing our finished product—will begin when the car is completed and ready to drive.
**Fidler, Meghan Sarah**  
Department of Psychology  

Discounting of Delayed Consequences in Women with Histories of Abuse  

**Rationale:** women with a history of abuse often have difficulty escaping abusive relationships. One potential factor that may influence this behavior is inappropriate sensitivity to delayed or diffused outcomes.  

**Objectives:** The purpose of the research is to compare sensitivity to delayed consequences in women with histories of abuse to that of matched controls.  

**Methods:** Participants engaged in a hypothetical money choice task to determine the relative subjective value of delayed rewards. A quantitative model relating delay to subjective value will be fit to each participant’s data. Derived parameters of the model related to sensitivity to delay will be compared across groups of participants.  

**Expected results:** If inappropriate sensitivity to delayed outcomes is a factor that contributes to enduring participation in an abusive relationship, then degree of delay discounting should differ significantly between women with histories of abuse and matched control participants.  

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**Bugle, Meagan**  
Department of Psychology  

Relationship Between Stress and Health in Students Who Also Work  

The purpose of this study is to examine the relationship between stress and health in work situations. This project will use a descriptive survey format with subjects who have worked or are currently working part-time or full-time and also attend school full-time or part-time. They will be given a stress coping questionnaire, which will be handed out during Dr. Swanson’s 323 Psychology class. The questionnaire is approximately 45 questions long and should take subjects no less than 30 minutes to complete. Students who participate will be given extra credit by their professor. It is expected that stress does cause health problems in work situations if the stress is not properly managed by the individual.  

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**Johnson, Gwena**  
Department of Psychology  

Personality, Communication, and Relationship Satisfaction  

Interpersonal relationships are an important aspect of most people’s lives; personality characteristics and effective communication skills can significantly influence romantic relationship satisfaction. Do opposites really attract, or are individuals more satisfied in their relationships if they are with someone who has similar personality traits? The goals of this study are to assess the relationship between personality traits, communication patterns, and couple satisfaction.