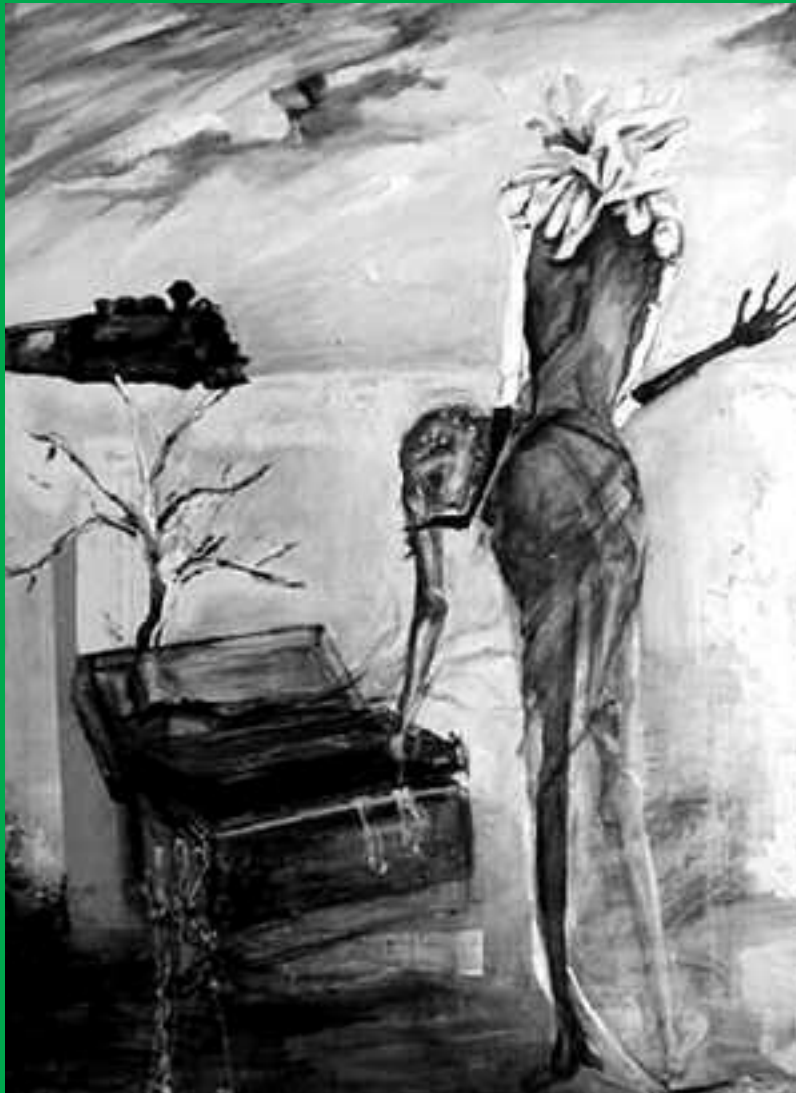


Undergraduate Scholars Day 2005

An event where students come to present and share their research



ARKANSAS STATE UNIVERSITY



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The Honors College is home to the National Student Exchange (NSE). NSE is a program where students can spend up to a year at another university in the US. ASU is the only university in Arkansas to be a part of this national program. You can spend a semester or year at another institution and pay ASU tuition and fees (where applicable).



WELCOME to UNDERGRAD SCHOLARS DAY

Welcome to the 6th annual Undergraduate Scholars Day (USD) at Arkansas State University. USD has been a part of the *Convocation of Scholars Week* since it first began in 1999. USD is a yearly event where students from across disciplines and departments gather to present and discuss their research. The collegial and professional environment of the USD provides a venue for all manner of academic research and activity. The USD offers space for Art and Design students to showcase their work along side students from the health sciences. USD has had engineering students present research on their findings and Humanities students present research on topics ranging from aesthetics to language. USD is a thriving and diverse program and with this year's program, the tradition continues.

USD also provides opportunities for students to interact more closely with professors who mentor the student through the process of readying their work for presentation in a professional environment. The benefits for students who participate in USD are varied. Some gain valuable research experience, some gain practice at public speaking and others simply enjoy the setting of USD which allows them to better know the various types of research that occur across the campus.

If you are interested in mentoring students for next year's USD, or are interested, as a student, in presenting at the USD, or simply want to know more about USD, please contact Dr. Michael K. Cundall Jr., Assistant Dean of The Honors College. Email: mcundall@astate.edu Phone: 972.2308

Best,

Dr. Michael K. Cundall Jr.
Assistant Dean of The Honors College

UNDERGRADUATE SCHOLARS DAY

April 11, 2005

9:00-11 A.M.

Room 3014, Mockingbird West

Panel 1: Professional relations for artist

Chair: Prof. Shelley Gipson, Art

Presenters:

Katie Cooper
Danielle Eastman
David Foust
Lacy Hohn
Megan Levacy
Ashley Morgan

Tessa Nelson
Shannon Smithee
Jillian Spagnola
Amanda Spain
William Tribble
Chris Young

9:00-11 A.M.

Room 3015, Mockingbird East

Panel 2: Politicians under the microscope: Microanalysis of the first Bush-Kerry debate

Chair: Patrick A. Stewart, Ph.D, Political Science

Presenters:

J. Mosley
Keith Heinrich
Jack Turner

11-12:30 LUNCH

Guitar & Music Performance

Heritage Plaza Lounge

Justin Dugger

Title: The three stylistic periods of Leo Brouwer's guitar music.

Carly Gorman

Title: Linear and non-linear development of musical ideas in the music of Arnold Schoenberg and Olivier Messiaen.

Thomas Head

Title: Toru Takemitsu's All in Twilight, Movement I: compositional style, technical performance aspects, and performance.

Timothy Miller

Title: Sound mass: Concept and application in Edgard Varese's Arcana and the music of twentieth-century composers.

Jay Shepherd

Title: Variations Over a Theme from the Magic Flute, Op.9 by Fernando Sor: Variation technique and performance concerns.

12:30-1:30 P.M.

Room 3014, Mockingbird West

Panel 3: Counseling Psychology

Chair: Dr. Irina Khramstova, Psychology

Presenters:

Jeremiah Dillehay

Title: Conceptions of happiness: Does age affect our beliefs and definitions of happiness?

Laura Howard, Rachel Roland, Andrew Watson

Title: Traditional versus positive psychology: A content analysis of the current trend in psychology as perceived by professionals in the field.

12:30-1:30

Room 3015, Mockingbird East

Panel 4: Philosophy and Psychology

Chair: Dr. Michael K. Cundall Jr., Philosophy

Presenters:

Melody Navarro

Title: Justified oppression: A defense of Mill's Harm Principle.

Whitney McMickle

Title: Teacher and pre-service teacher beliefs about the outcomes of different types of child abuse.

Alex Ramsey

Title: Darwinism versus feminism.

1:30-2:30 P.M.

Room 3014, Mockingbird West

Panel 5: Counseling Psychology continued

Chair: Dr. Irina Khramstova, Psychology

Presenters:

Jenny Estes, Sean Gearson, Melissa Shortnancy

Title: Job satisfaction in psychology related professions: Well, the pay could be better.

Rebecca Breckenridge

Title: Employer attitudes and college graduates.

Robbie Cline

Title: Examining proficiency in statistics using survey projects in undergraduate statistics labs.

1:30-2:30 P.M.

Room 3015, Mockingbird East

Panel 6: Applications in Engineering

Chair: Dr. Chris Edrington, Engineering

Presenters:

Bill Yancy

Title: Reduced parts converter for realization of bipolar excitation for a 4-phase 8/6 switched reluctance machine.

Alex Skorcz

Title: Modeling of a 4-phase 8/6 switched reluctance machine operating under multi-phase excitation by utilizing artificial neural networks.

2:30-3:30 P.M.

Room 3014, Mockingbird West

Panel 7: McNair student projects

Chair: P. Gail McDonal, McNair Programs

Presenters:

Nathan Gastineau

Title: Functional equations and iteration.

Taylor Ingle

Title: Neuroactive responses of pesticide exposure on rats.

Bradley Hamilton

Title: Elemental chemistry of endolymph and otolith: passive recorder or active writer?

Bret Yount

Title: Remote detection of 129i16o in extremely low concentrations.

2:30-3:30 P.M.

Room 3015, Mockingbird East

Panel 8: Biology

Chair: Dr. Rich Grippo, Biology

Presenters:

Jeff Hall

Title: Development of an ion-loss bioassay using the asian clam, Corbicula fluminea.

Melissa Milligan

Title: Water quality and ecosystem function on upper and lower reaches of tributaries of the L'Anguille River, Arkansas.

3:30-4:30 P.M.

Room 3014, Mockingbird West

Panel 9: Communication Disorders

Chair: Dr. Rick Neely, Communication Disorders

Presenters:

Laura Harrison

Title: The SpeechEasy: Technologically advanced treatment for people who stutter.

Kelly Nicholson

Title: A demonstration of the CSL: A modern instrument for acoustic analysis.

3:30-4:30 P.M.

Room 3015, Mockingbird East

Panel 10: Journalism

Chair: TBA

Presenters:

Amber Nelson

Title: Television News Consumption and Knowledge of World Affairs.

Stacy Hudson

Title: College students: How they perceive politicians in relation to their uses of the media.

Courteny Rowe

Title: "Public Universities in Arkansas: A Content Analysis of How They are Using their Websites to Reach Constituencies"

4:30-6:00 P.M.

Room 3015, Mockingbird West

Panel 11: Student films

Chair: Dr. Cyndy Hendershot, English

Presenters:

Christopher Shipman

Title: Behind the wall.

Joseph Bynum

Title: The domesticated housedog in the key of Chopin.

Amanda Polston

Title: The odd couple: Behind the scenes.

Christopher Perrine

Title: Overdose me.

4:30-5:30 P.M.

Room 3016, Mockingbird East

Panel 11: Biology

Chair: Dr. Malathi Srivatsan, Biology

Presenters:

Jonathan Treece

Title: Nicotine and developing autonomic neurons of mammalian nervous system.

Elizabeth Compton

Title: Do snake skins deter predation of Great Crested Flycatcher nests? An artificial-nest experiment.

Breckenridge, Rebecca

Title: Employer attitudes and college graduates.

Mentor: Dr. David Saarnio, Psychology

What do employers want from college graduates? This study examined job recruiters' ratings of the relative importance of student background variables that are often cited as influential for employment decisions. Though college students are told by advisors and counselors that grades and participation in extracurricular activities are factors in finding a job, perhaps instead they should be told that being well rounded and pleasant to be around are more important for future success.

Bynum, Joseph

Title: The domesticated housedog in the key of Chopin.

Mentor: Dr. Cyndy Hendershot, English

This documentary records the mannerisms and lifestyle of a domesticated Cocker Spaniel. The majority of the setting centers on the home life of the subject: shots of playing, feeding, and relaxing constitute this portion of black and white filming. To contrast the dog's familiar backdrop, color picture is used during the park scene. This coloring device portrays the unique experience associated with the change of scenery. Instead of using the sound track originally recorded with the picture, the music of Chopin is substituted. The melodic piano removes the incoherent aspect of language for the animal, replacing it with the illusion of carefree thought akin to a lapdog's consciousness. The dubbing of classical music also aids in excluding outside entities from the focus of the film.

Cline, Robbie

Title: Examining proficiency in statistics using survey projects in undergraduate statistics labs.

Mentor: Dr. Amy Pearce, Psychology

A survey project was examined as a viable alternative to a comprehensive final as a means of assessing proficiency in statistics. Undergraduate students enrolled in an undergraduate statistics lab collected quantitative and nominal data from the ASU population which they then analyzed, interpreted, and reported. Upon completion students perceptions of the project were assessed. The outcomes and educational potential of the project is discussed herein.

Compton, Elizabeth

Title: Do snake skins deter predation of Great Crested Flycatcher nests? An artificial-nest experiment.

Mentor: Dr. Tom Risch, Biology

It has been generally observed that Great Crested Flycatchers (*Myiarchus crinitus*) will put snake skins inside their nests. It has been widely assumed that this is done to decrease predation. Southern flying squirrels (*Glaucomys volans*) have been observed to depredate flycatcher nests and they are themselves the prey of the black rat snake (*Elaphe obsoleta*). This study looked at the relationship between the use of snake skins in Great Crested Flycatcher nests and predation by southern flying squirrels. We predicted that the snake skins do in fact decrease predation on nests and that a visible snake skin will decrease it even further. We built 60 artificial nests in nest boxes to test this hypothesis. Twenty of the boxes had no black rat snake skin (control), twenty with a single skin wrapped around the nest, and twenty with a skin wrapped around the nest and another displayed outside the box. Five of the control boxes were depredated, while none of the experimental boxes were depredated. This supports the hypothesis that the snake skin is an evolved response to deter mammalian predators, especially the southern flying squirrels. It still must be determined if this is a visual or olfactory response.

Cooper, Katie

Title: Professional relations for artists.

Mentor: Prof. Shelley Gipson, Art

I use color to unify my work with bold experimental images that range from print to motion. I am open to endless possibilities for executing problems and am inspired by people and travel.

Dillehay, Jeremiah

Title: Conceptions of happiness: Does age affect our beliefs and definitions of happiness?

Mentor: Dr. Irina Khramstova, Psychology

Do people with more life experiences view happiness differently than younger people? In order to answer this question we will administer a questionnaire consisting of different components of happiness to public school teachers from Batesville School District and ASU college students. We hypothesize that in contrast to younger individuals, more mature participants will favor the eudaimonic definition. According to Aristotle, eudaimonia is a self-actualization process which results in happiness.

Justin Dugger

Title: The three stylistic periods of Leo Brouwer's guitar music.

Mentor: Dr. Timothy Crist, Music

Cuban born guitarist and composer, Leo Brouwer, is one of the most significant modern composers for the classical guitar. His works range from pedagogical exercises to profound, extended works that challenge the performer both technically and musically. Brouwer's career may be neatly divided into three stylistic periods. Elements that comprise each of these periods will be discussed with accompanying musical examples. A live performance of Un Dia de Noviembre for solo guitar will conclude the presentation.

Eastman, Danielle

Title: Professional relations for artists.

Mentor: Prof. Shelley Gipson, Art

I delve into the subconscious to regain what the mundane reality of our everyday existence takes away. My work is composed of objects that are recognizable in our physical world. At the same time, these objects or beings are altered as not to be realistic to the physical world.

Estes, Jenny

Title: Job satisfaction in psychology related professions: Well, the pay could be better.

Mentor: Dr. Irina Khramstova, Psychology

Are psychology professionals satisfied in their jobs? Thirty-nine professionals in fields ranging from social work to psychiatry were surveyed by personal interview or email. They were asked to describe various aspects of their job and to rate their satisfaction in each of those areas on a 5- point Likert scale from "absolutely unsatisfied" to "totally satisfied". It was found that the participants were overall satisfied with their jobs. However, the intrinsic rewards (e.g., opportunity to use one's talents) were rated higher than the extrinsic aspects of the profession (e.g., pay rate).

Foust, David

Title: Professional relations for artists.

Mentor: Prof. Shelley Gipson, Art

I paint and draw in styles ranging from Realism to Expressionism. I enjoy using strong colors to create images from the Bible, nature and the soul. I have a spiritual conversation with myself through my work and hope to share this spirituality with my audience.

Gastineau, Nathan

Title: Functional equations and iteration.

Mentor: Dr. William Paulsen, Mathematics

One field of mathematics that has not been researched to a great extent is the study of functional equations. Functional equations can be solved by using iteration, and in the process of solving them can produce interesting similarities in their solutions. These similarities, but not equalities, make solving these equations very difficult. The process of solving functional equations can yield two separate conclusions. Even though the conclusions should be equal, the relationship that they do have with each other was unexpected. It seems that the two solutions, when plotted with, what I refer to as, a log-ratio comparison, it shows a sinusoidal wave graph of very small amplitude. This implies that, while the two solutions are not equal, they are very close. In fact, they are predictably close to the exact same value, indicating that something is going on behind the scenes that we are not yet familiar with.

Gearson, Sean

Title: Job satisfaction in psychology related professions: Well, the pay could be better.

Mentor: Dr. Irina Khramstova, Psychology

Are psychology professionals satisfied in their jobs? Thirty-nine professionals in fields ranging from social work to psychiatry were surveyed by personal interview or email. They were asked to describe various aspects of their job and to rate their satisfaction in each of those areas on a 5- point Likert scale from "absolutely unsatisfied" to "totally satisfied". It was found that the participants were overall satisfied with their jobs. However, the intrinsic rewards (e.g., opportunity to use one's talents) were rated higher than the extrinsic aspects of the profession (e.g., pay rate).

Gorman, Carly

Title: Linear and non-linear development of musical ideas in the music of Arnold Schoenberg and Olivier Messiaen.

Mentor: Dr. Timothy Crist, Music

The musical works of Arnold Schoenberg and Olivier Messiaen offer contrasts in the manner in which musical ideas develop. Schoenberg's Fourth String Quartet, Op. 37 involves a traditional development technique similar to the development procedures found in the music of Bach and Beethoven. Messiaen's Couleurs de la Cité Céleste departs from tradition and explores a non-linear means of development where adjacent ideas do not cohere. The manner in how musical material develops in both of these pieces will be discussed and pre-recorded musical examples will be played.

Hall, Jeff

Title: Development of an ion-loss bioassay using the Asian clam, Corbicula fluminea.

Mentor: Dr. Rich Grippo, Biology

Since the eighteenth century, heavy metal contamination of aquatic ecosystems has been a concern. Further development is needed for effectively monitoring the impact of metals on aquatic ecosystems. A bioassay exposing a heavy metal to molluscan tissues may be part of the solution. Bivalves, such as the Asian clam *Corbicula fluminea*, have been shown to be useful indicator organisms of heavy metal contamination. The hypothesis that measurement of whole body cation loss from the Asian clam, *Corbicula fluminea*, is an indicator of copper contamination was evaluated using the body ion loss biomarker. Clams were exposed to copper sulfate in dechlorinated Jonesboro municipal tap water. Water chemistry and time of exposure effects on change in net body cation (Na^+ , Ca^{2+} , Mg^{2+} , K^+ , and Cu^+) flux from the clams was determined by exposing clams to (1) copper at a high hardness (60-70 mg/L) and low hardness (5-10 mg/L) for 24 hours and (2) copper at high hardness for 96 hours. Results from the hardness comparison test showed a net loss of sodium (efflux), magnesium, and potassium at both levels of test water hardness. Sodium efflux occurred in both high and low hardness with increased efflux at high hardness. Magnesium efflux occurred at high hardness but the clams gained Mg (influx) at low hardness. Potassium flux showed an influx at both high and low hardness. Calcium flux showed net influx at high hardness and slight net efflux at low hardness. Copper showed slight efflux at high hardness and influx at low hardness. Results after 96 hours of exposure to Cu showed a net loss in sodium but no pattern for calcium or potassium body levels. Sodium efflux slowed over time for lower Cu exposure levels; at higher Cu levels sodium showed an influx. Magnesium flux showed a positive relationship with copper levels in exposure water. Copper showed influx over time of exposure for all Cu exposure concentrations, suggesting Cu was entering the clams. These results indicate that change in some body ions are a sensitive, acute indicator of copper exposure and may be a useful biomarker for determining copper pollution in aquatic ecosystems.

Hamilton, Bradley

Title: Elemental chemistry of endolymph and otolith: passive recorder or active writer?

Mentor: Dr. Rich Grippo, Biology

Over the past two decades the chemistry of fish ear stones (otoliths) has been increasingly employed to study the environmental life histories of fish. Under the assumption that the otolith, composed of calcium carbonate in the form of aragonite, passively records the chemistry of the water masses encountered by the fish. Researchers have used the relative abundance of divalent cations compared to calcium ascribing significance to these otolith ratios related to water chemistry. Little is known about the mechanisms of neither otolith formation nor the potential elemental fractionation that might occur during otolith formation. This study presents data that compares the otolith chemistry to the chemistry of the fluid surrounding the precipitating otolith, the endolymph. In this study we explored the relative abundance of metals in both phases with specific focus on those elements used in environmental life history studies. If, as hypothesized, the otolith is a passive recorder there should be no elemental frac-

tiation between endolymph and otolith. If fractionation between the phases is observed this may point to biological mechanisms leading to fractionation of elements during aragonite growth. Endolymph was extracted from the membranous section of the inner ear in the golden redhorse (*Moxostoma*). For each sample, sagittal otoliths and endolymphatic material were separated and elemental chemistry measured by DRC-ICP-MS. The endolymph is a supersaturated liquid with trace element concentrations an order of magnitude larger than those in the corresponding otolith. Elemental fractionation between the two phases was not observed suggesting that the otolith may indeed faithfully record the relative abundances of divalent cations in water with little to no biological overprint.

Harrison, Laura

Title: The SpeechEasy: Technologically advanced treatment for people who stutter.

Mentor: Ms. Tisha Pierce, Communication Disorders

Stuttering is a speech problem affecting more than three million people in the United States. The severity of stuttering ranges from mild to profound. The disorder of stuttering carries many psychological and social stigmas that can be debilitating to the person who stutters. Many different therapy options have been offered in the past. These have worked for some people who stutter, but have been largely ineffective for others. A recent advancement in fluency technology has resulted in the development of the SpeechEasy device. The SpeechEasy alters the frequency and time of incoming auditory information. The device offers new hope for many people who stutter who failed to benefit from traditional stuttering therapy. As with any new therapy technique, efficacy must be investigated. A comprehensive review of the current research data regarding the SpeechEasy will be discussed.

Head, Thomas

Title: Toru Takemitsu's All in Twilight, Movement I: Compositional style, technical performance aspects, and performance.

Mentor: Dr. Timothy Crist, Music

Toru Takemitsu (1930-1996) was the best-known Japanese composer of his generation and is significant for bringing aspects of Eastern and Western musical traditions together. His four-movement work for classical guitar, *All In Twilight*, was composed in 1987 for guitarist, Julian Bream. The first movement of this work contains many elements of Takemitsu's compositional style. This presentation will involve a discussion of some of these elements, the technical challenges involved in performing the piece, and a live performance of the first movement.

Heinrich, Keith

Title: Politicians under the microscope: Microanalysis of the first Bush-Kerry debate.

Mentor: Patrick A. Stewart PhD, Political Science

Although Presidential debates have been more accurately described as "side-by-side press conferences", they offer the opportunity for viewers to assess the personality, character and intellect of contending candidates. The 2004 Presidential debates offered just such an opportunity as President George W. Bush and Senator John F. Kerry squared off in a series of three debates in the month before the election. The first debate, focusing on foreign policy, was seen as a "win" for Senator Kerry as President Bush was perceived as anxious by the press and the public in post-debate opinion surveys, while Kerry was seen as more "Presidential". While verbal response has typically been focused on in previous studies with the candidate providing the most compelling arguments winning, nonverbal behavior has increasingly been seen as key in candidate assessment. Therefore, this study proposes to analyze nonverbal behavior that is relatively reliable in communicating emotional state, that of eye blink rates. Specifically, we propose to measure eye blinks for each candidate in 5-second increments over the course of the debate and analyze it in the context of debate behavior.

Hohn, Lacy

Title: Professional relations for artists.

Mentor: Prof. Shelley Gipson, Art

My work is realistic. I am interested in human nature. Using pencil, I draw the human figure, especially portraiture.

Howard, Laura

Title: Traditional versus positive psychology: A content analysis of the current trend in psychology as perceived by professionals in the field.

Mentor: Dr. Irina Khramstova, Psychology

The purpose of this qualitative study was to determine if the science of psychology is changing direction from treatment of mental disorders to promoting psychological well-being. Thirty-nine professionals in the field of psychology and counseling were interviewed by contemporary psychology students. We focused on the responses concerning the role of psychology in our society. The content analysis of the participants' answers indicated that psychology is shifting from treatment of mental disorders to promotion of psychological well-being.

Hudson, Stacy

Title: College students: How they perceive politicians in relation to their uses of the media.

Mentor: Dr. Mary Jackson-Pitts, Radio & TV

The purpose of this research was to study the relationship between college students' perceptions of political candidates and the students' use of the media. The research was done due to the number of college students today who do not keep themselves informed about political news. The study offered three research questions: (1) Where do college students get their news about politicians, (2) What are college students' perceptions of politicians, and (3) Is there a relationship between college students' use of the media and their perceptions of politicians? The research studied what specific television, newspaper, radio, Internet, and magazines college students get their news from; their political beliefs and whether or not they believe it is important to stay informed about political news; and from what media outlets they see/hear/read political advertisements and stories. Research also questioned college students' perceptions of political candidates, their party affiliations, and various values they believe are important in a political candidate. In addition, the research also addresses how often students use the various forms of media, their media preferences, their range of attitudes toward political issues they consider important or unimportant, and political encouragement they have received from others, including their parents.

Ingle, Taylor

Title: Neuroactive responses of pesticide exposure on rats.

Mentor: Dr. Roger Buchanan, Biology

Two commonly used pesticides in this area, Diazinon and Malathion, both contain active ingredients that are known to have neuroactive properties. I am investigating the effects of these pesticides on two regions of the brain, the pedunculo pontine nucleus (PPN) and the hippocampus, known to be important in processing of sensory information. The PPN is a part of the reticular activating system (RAS) that is involved in responses to novel stimuli, especially those that trigger startle responses. The hippocampus is involved in memory and learning. I will be investigating the effects of these pesticides by characterizing exposure induced changes in the P13 auditory evoked potential generated by the PPN and the N40 potential generated by the hippocampus. These techniques allow real-time changes in brain function that are associated with pesticide exposure to be examined. I have developed techniques for exposing Sprague Dawley rats to an aerosol containing known amounts of pesticide while simultaneously recording these responses. The effects of pesticides are characterized by measuring changes in the latency, amplitude and habituation of the P13 and N40 and startle responses. The effects of both acute and chronic exposures were examined. Responses of exposed animals were also compared to those of animals exposed to an aerosol of distilled water. Humans exhibit responses that are similar to those I am characterizing in this animal model, so the results of these experiments may have health implications for workers and others exposed to these pesticides.

Levacy, Megan

Title: Professional relations for artists.

Mentor: Prof. Shelley Gipson, Art

I explore emotional issues that form walls around a person: the search for one's inner-self forces confrontation of these boundaries. Through the representation of everyday objects, I confront my boundaries to find my individuality. The symbols I use signify something spiritual within myself and beckon others to do the same.

McMickle, Whitney

Title: Teacher and pre-service teacher beliefs about the outcomes of different types of child abuse.

Mentor: Dr. Karen Yanowitz, Psychology

Teacher and pre-service teacher beliefs about the outcomes of different types of child abuse were studied. Teacher participants included teachers from all grade levels, Kindergarten through twelfth grade, at two school districts in Northeastern Arkansas. Pre-service teacher participants included students majoring in education at Arkansas State University. Three versions of a survey were prepared and distributed. There was one survey for each kind of child abuse studied, including physical abuse, sexual abuse, and neglect. The information collected will reflect their beliefs about how they think a child who has been abused in a certain way might behave in the classroom.

Timothy Miller

Title: Sound mass: Concept and application in Edgard Varese's Arcana and the music of twentieth-century composers.

Mentor: Dr. Timothy Crist, Music

A sound mass may be defined as a dense harmonic structure in which pitch lacks clear definition. Edgard Varese employed the compositional technique of sound mass in many of his works including Arcana. The concept and practice of using sound masses in Arcana as a compositional tool as well as commenting on the use of sound masses in the works of Ligeti, Xenakis, and others will be discussed. Recorded examples will accompany the presentation.

Milligan, Melissa

Title: Water quality and ecosystem function on upper and lower reaches of tributaries of the L'Anguille River, Arkansas.

Mentor: Dr. Rich Grippio, Biology

Crowley's Ridge and agricultural areas have an unknown and controversial contribution to the L'Anguille River and its tributaries. The L'Anguille River, which flows through Poinsett, St. Francis, Cross and Lee counties, has been designated an impaired water body under 303d of the Clean Water Act. This impairment is due to elevated sediments and pathogens, which have an effect on aquatic life and human use of the river. Four eastern tributaries of the L'Anguille River (Big Tellico, Lick Run, Prairie Creek, and Cooper Creek) are being evaluated in an on-going project to determine if elevated sediments and nutrients are coming from Crowley's Ridge (upper reach) or from agricultural areas (lower reach). Physio-chemical water variables, including water temperature, dissolved oxygen, pH, nutrients (NO₃ and PO₄), turbidity, alkalinity, hardness and conductivity, were simultaneously measured at upper and lower reaches during the past 2.75 years, several seasons, and during different climatic conditions. Additionally, in-stream red oak leaf degradation rates (an indirect measure of ecosystem function) were simultaneously determined in upper and lower tributary reaches from November 2003 to February 2004. Measurements of variables were compared with L'Anguille River discharge measured at Palestine, AR. During low stream flow the contribution of Crowley's Ridge and delta agriculture were similar, but during higher stream discharge periods (presumably following increased rainfall) turbidity and to a lesser extent nutrients were significantly elevated in the lower reaches of most of the tributaries. Leaf degradation rates were not significantly different between reaches. Differences between Crowley's Ridge and agricultural contribution do not appear to affect stream ecosystem function in L'Anguille River tributaries as measured by leaf degradation.

Morgan, Ashley

Title: Professional relations for artists.

Mentor: Prof. Shelley Gipson, Art

I deal with and acknowledge contrasting elements of an ideal perspective. I allow my work to be viewed in a natural and elegant fashion with the intent of a contradicting idea. I take objects out of their common context and allow the audience to capture a different view.

Mosley, Jonathan "Chad"

Title: Politicians under the microscope: Microanalysis of the first Bush-Kerry debate.

Mentor: Patrick A. Stewart PhD, Political Science

Although Presidential debates have been more accurately described as "side-by-side press conferences", they offer the opportunity for viewers to assess the personality, character and intellect of contending candidates. The 2004 Presidential debates offered just such an opportunity as President George W. Bush and Senator John F. Kerry squared off in a series of three debates in the month before the election. The first debate, focusing on foreign policy, was seen as a "win" for Senator Kerry as President Bush was perceived as anxious by the press and

the public in post-debate opinion surveys, while Kerry was seen as more "Presidential". While verbal response has typically been focused on in previous studies with the candidate providing the most compelling arguments winning, nonverbal behavior has increasingly been seen as key in candidate assessment. Therefore, this study proposes to analyze nonverbal behavior that is relatively reliable in communicating emotional state, that of eyeblink rates. Specifically, we propose to measure eyeblinks for each candidate in 5-second increments over the course of the debate and analyze it in the context of debate behavior.

Navarro, Melody

Title: Justified oppression: A defense of Mill's Harm Principle.

Mentor: Dr. Eric Cave, Philosophy

For the good of a state, that state must be able to limit the liberties of its citizens in many respects. This assertion seems unarguable, for without limitations upon individual liberty, a state would almost certainly disintegrate into a breeding ground of bedlam, anarchism, perhaps even civil war. The question remains, however, just what liberties can be justifiably repressed and to what extent, and how should an organized society go about deciding on what standards any proposed package of liberty-limiting principles should be expected to meet in order to be considered truly just. In this paper, I examine this question within the framework of the Harm Principle of J.S. Mill and consider major objections to Mill's case for the justification of state-repressed liberties based on harm prevention. I argue that these objections fall short, and that Mill's Harm Principle is the more plausible among its major competitors.

Nelson, Amber

Title: Television news consumption and knowledge of world affairs.

Mentor: Dr. Osabuohien P. Amienyi, Journalism

Research has been conducted in the area of television news and the news audience. There has not been research in the area of television news consumption and knowledge of world affairs, especially in the area of local and national news programs. Previous research has been limited to television news audience perception and recall. This study attempts to find a relationship between the amount of local and national television news watched and knowledge of world affairs. High school students were used as participants in this study. A group of 152 students at a high school in Forrest City, Arkansas completed a 20 item questionnaire in their math and broadcasting class. The questionnaire asked questions about the amount of local and television news watched and asked questions about notable worldwide events. The researcher found that students who watched the most local and national news programs did not have a high percentage of correctly answered world affair questions. Those that watched less local and national news had more correctly answered questions, but this was still a small percent. The researcher did find that more students knew the answers that dealt with the United States.

Nelson, Tessa

Title: Professional relations for artists

Mentor: Prof. Shelley Gipson, Art

As an artist I express the many emotions that we, as humans, experience. This expression is not a literal one, but one that is open-ended. The viewer relates to the work on an emotional level, making connections to events in their own lives.

Nicholson, Kelly

Title: A demonstration of the CSL: A modern instrument for acoustic analysis

Mentor: Dr. Mike McDaniel, Audiology

The Computerized Speech Language (CSL) is Kay Elemetric's most advanced speech analysis hardware system. It is used in the acquisition, acoustic analysis, display, and playback of speech signals. Multi-Speech, a software companion to CSL, is a comprehensive speech recording, analysis, feedback, and measurement program. Although both are quite innovative, CSL and Multi-Speech are easy to use. This ease of use is complemented by the powerful feature set of the program. Every function can be adjusted to suit even advanced research requirements. For example, the spectrographic analysis has adjustments for nine filter bandwidths, four window weightings, full scaling, color, pre-emphasis, and dynamic range. The hardware is capable of capturing and playing with any sampling rate, editing these speech samples, analyzing multiple pitches, glottal event markers, formant history, spectral characteristics of the acoustic signal, temporal characteristics of the signal, and acoustic energy of the signal. Since being introduced ten years ago, CSL has become the instrument of choice for clinicians and university researchers all over the country. This hardware is a powerful, low cost, and easy to use speech analysis program

that is ideal for research, teaching, and clinical applications. Since Arkansas State University's recent purchase of the CSL and Multi-Speech software, many clients of the communications disorders department have benefited, as have the students. I will be demonstrating the basic use of the Computerized Speech Language hardware, a modern instrument for acoustic analysis.

Perrine, Christopher

Title: Overdose me.

Mentor: Dr. Cyndy Hendershot, English

This mockumentary is a hilarious send-up of the hit documentary "Supersize Me." With a drug dealer named Pookie and more surprises, this film is a crowd-pleaser!

Polston, Amanda

Title: The odd couple: Behind the scenes.

Mentor: Dr. Cyndy Hendershot, English

This documentary follows an acting group's failure and success in trying to bring a production to the stage. All the audience sees is the final product, but this film brings to light a behind-the-scenes look at how a play is put together from rehearsal to performance.

Ramsey, Alexandra

Title: Darwinism versus feminism.

Mentor: Dr. Amy Pearce, Psychology

Although the writings of Charles Darwin have been very influential to the formation of evolution and the process of evolution, many feminist researchers do not accept these theories because they believe them to be patriarchal and androcentric. Therefore, a very heated and controversial debate has emerged that challenges the major theoretical assumptions provided by evolutionary theory. This presentation addresses the theories of natural and sexual selection and their implications regarding sex roles, resource accrual, attraction, parental investment theory, and sexual strategies. This presentation also provides a detailed argument provided by feminists against the propositions made by evolutionary theorists. The literature reviewed in this presentation outlines the major concerns and complaints regarding this issue and provides many illustrative examples to support their views and assumptions.

Roland, Rachel

Title: Traditional versus positive psychology: A content analysis of the current trend in psychology as perceived by professionals in the field.

Mentor: Dr. Irina Khramstova, Psychology

The purpose of this qualitative study was to determine if the science of psychology is changing direction from treatment of mental disorders to promoting psychological well-being. Thirty-nine professionals in the field of psychology and counseling were interviewed by contemporary psychology students. We focused on the responses concerning the role of psychology in our society. The content analysis of the participants' answers indicated that psychology is shifting from treatment of mental disorders to promotion of psychological well-being.

Rowe, Courteny

Title: "Public Universities in Arkansas: A Content Analysis of How They are Using their Websites to Reach Constituencies"

Mentor: Dr. Mary Jackson-Pitts, Radio & TV

This study sought to content-analyze the websites of the ten four year public universities in Arkansas to determine how the websites address their constituencies. Each of the ten four-year public universities that accept undergraduates were content analyzed in this study. The sample was obtained from the Arkansas Department of Higher Education website. A census sample was used for this study because it is necessary to examine all of the four-year public universities in Arkansas in order to get an accurate account of how universities of all sizes in the state are addressing their constituents. One hundred and thirteen variables were examined. Three coders were used. Research questions asked how university websites address the constituents as a whole, how university websites address students, how university websites address faculty and staff, how university websites address potential donors, and whether size affects how the universities address their constituents.

Shipman, Christopher

Title: Behind the wall.

Mentor: Dr. Cyndy Hendershot, English

"Behind the wall" is a documentary on the server area of Mazzio's Pizza in Jonesboro, AR. The film length is 17 minutes and 42 seconds, and was filmed and edited with one digital video camera. The premise of the film is quite simple. The camera is seen as an eye opening and closing itself upon various images throughout the dining area of the store. The images shot previous to the arrival of customers and employers are purposefully projected with an element of ominous hyperbole in which an audience might anticipate the absurdity of the situation to come. An employee gives the film's few credits from a ticket book that she retrieves from her apron that has the authentic version of ticket for each of the servers filmed, along with the title of the film. When the employee has finished she runs frantically behind the wall of the server area where the chaos begins. Various images spliced together create a pointed definition of the behavioral attitude towards the job of a server. The film is meant to display a sarcastic tone that relays the utter contempt that the servers maintain for their workplace, and with the customers they serve. The sarcasm is in the ridiculous level of indignance coupled by humor that is shown by the servers when they feel trapped, behind a wall so to speak.

Shortnancy, Melissa

Title: Job satisfaction in Psychology related professions: Well, the pay could be better.

Mentor: Dr. Irina Khramstova, Psychology

Are psychology professionals satisfied in their jobs? Thirty-nine professionals in fields ranging from social work to psychiatry were surveyed by personal interview or email. They were asked to describe various aspects of their job and to rate their satisfaction in each of those areas on a 5- point Likert scale from "absolutely unsatisfied" to "totally satisfied". It was found that the participants were overall satisfied with their jobs. However, the intrinsic rewards (e.g., opportunity to use one's talents) were rated higher than the extrinsic aspects of the profession (e.g., pay rate).

Skorc, Alex

Title: Modeling of a 4-phase 8/6 switched reluctance machine operating under multi-phase excitation by utilizing artificial neural networks.

Mentor: Dr. Chris S. Edrington, Engineering

The operation of the switched reluctance machine is highly complex and is additionally multivariable. Typically, simplifying assumptions are made as to decrease the complexity of a mathematical model that describes some system. The assumption of superposition is placed upon the SRM, and the analysis is generally conducted on a per-phase basis, despite the fact that it is experiencing multi-phase excitation. In the operation of the SRM, the back-iron in the stator/rotor and their poles become highly saturated magnetically, producing nonlinear relationships between torque and current. Due to the assumption of linearity, erroneous results are produced regarding the torque/current relationship of the SRM. Finite element analysis can be used to obtain highly accurate data representing the multiphase excitation characteristics of the SRM. Utilizing an artificial neural network, this data can then be developed into an accurate algorithm, which accounts for the nonlinear relationship between phase currents and the developed electromagnetic torque.

Smithee, Shannon

Title: Professional relations for artists.

Mentor: Prof. Shelley Gipson, Art

I am a student working hard to be an acting artist. I am open-minded and am not limited in my interests.

Spagnola, Jillian

Title: Professional relations for artists.

Mentor: Prof. Shelley Gipson, Art

I create artwork that touches people's souls. My oil paintings and charcoal drawings relate specifically to young adults. Expressive strokes are used to emphasize emotional feeling to expose society's crises.

Spain, Amanda

Title: Professional relations for artists.

Mentor: Prof. Shelley Gipson, Art

My work is a mix of surrealism and realism. I am fascinated by human anatomy, both scientific and psychological. I illustrate the connotations of organs such as the heart and brain, combining the physical with the emotional.

Trecece, Jonathan

Title: Nicotine and developing autonomic neurons of mammalian nervous system.

Mentor: Dr. Malathi Srivatsan, Biology

Regardless of well known detrimental effects of nicotine in cigarette smoke, many pregnant women smoke, exposing fetus and new born babies to nicotine. Yet studies on the dose and time dependent effects of nicotine on developing neurons are lacking, thus necessitating this study. Neurons from Superior Cervical Ganglia (SCG) of one day old rat pups were dissociated, maintained in cell culture, and were exposed to 0.1, 1, and 10 μ M of nicotine for 24 and 48 hours. Neurite length was measured from digitized images of control and experimental neurons. 24 hours of exposure to 10 μ M of nicotine significantly reduced neurite growth and the underlying mechanisms are currently being investigated.

Tribble, William

Title: Professional relations for artists.

Mentor: Prof. Shelley Gipson, Art

I explore mankind's creation of machines whose sole purpose is the torture and execution of other human beings. These devices are recreated with found objects and function with simplistic absurdity. My goal is the acknowledgement of this distasteful capability of man, which creates feelings of nausea and aversion.

Turner, Jack

Title: Politicians under the microscope: Microanalysis of the first Bush-Kerry debate.

Mentor: Patrick A. Stewart PhD, Political Science

Although Presidential debates have been more accurately described as "side-by-side press conferences", they offer the opportunity for viewers to assess the personality, character and intellect of contending candidates. The 2004 Presidential debates offered just such an opportunity as President George W. Bush and Senator John F. Kerry squared off in a series of three debates in the month before the election. The first debate, focusing on foreign policy, was seen as a "win" for Senator Kerry as President Bush was perceived as anxious by the press and the public in post-debate opinion surveys, while Kerry was seen as more "Presidential". While verbal response has typically been focused on in previous studies with the candidate providing the most compelling arguments winning, nonverbal behavior has increasingly been seen as key in candidate assessment. Therefore, this study proposes to analyze nonverbal behavior that is relatively reliable in communicating emotional state, that of eye blink rates. Specifically, we propose to measure eye blinks for each candidate in 5-second increments over the course of the debate and analyze it in the context of debate behavior.

Watson, Andrew

Title: Traditional versus positive psychology: A content analysis of the current trend in psychology as perceived by professionals in the field.

Mentor: Dr. Irina Khramstova, Psychology

The purpose of this qualitative study was to determine if the science of psychology is changing direction from treatment of mental disorders to promoting psychological well-being. Thirty-nine professionals in the field of psychology and counseling were interviewed by contemporary psychology students. We focused on the responses concerning the role of psychology in our society. The content analysis of the participants' answers indicated that psychology is shifting from treatment of mental disorders to promotion of psychological well-being.

Yancy, Bill

Title: Reduced parts converter for realization of bipolar excitation for a 4-phase 8/6 switched reluctance machine.

Mentor: Dr. Chris S. Edrington, Engineering

It has been discovered that in multi-phase switched reluctance machines (SRM) two distinct possibilities for the flux path in the stator back-iron exist. The two paths are the "long flux path" (LFP) and "short flux path" (SFP). By using SFP excitation the SRM can produce more electromagnetic torque for the same level of current that would be provided if it were in LFP excitation. Bipolar excitation is necessary in order to benefit from the SFP. Using a standard asymmetric bridge converter, 32 devices are needed to achieve bipolar excitation. Thus a reduced parts converter topology that utilizes 20 devices will be explored in order to maintain this enhanced performance, while yielding a reduced cost, in order to make the bipolar excitation strategy a viable alternative for the SRM. The difficulty in using the reduced parts converter arises from the fact that by reducing the number of switch/diode pairs, independency of phase current regulation is lost. This research will address these issues by developing an appropriate current regulation algorithm that incorporates the phase current dependency as well as the varying phase inductance.

Young, Christopher

Title: Professional relations for artists.

Mentor: Prof. Shelley Gipson, Art

My work explores life struggles such as the creation of human life, the inner conflict of sin and the last days of human existence. I utilize realism and surrealism in my paintings and drawings to express my feelings on such issues.

Yount, Brett

Title: Remote detection of $^{129}\text{I}^{16}\text{O}$ in extremely low concentrations.

Mentor: Dr. Bruce Johnson, Physics

The research in which I am taking part is for remotely detecting small, extremely small, concentrations of molecules containing one isotope of an atom in the presence of molecules containing another isotope of the same atom. This is done by means of directing a pulse of laser light at the molecules, and then detecting their fluorescence. We use this method of forcing molecules to absorb light and then emit, since this can be done across great distances, perhaps even ten to twenty kilometers. Our research involves a simple diatomic molecule, Iodine Oxide, ($^{129}\text{I}^{16}\text{O}$), as a target species. We will be specifically trying to excite $^{129}\text{I}^{16}\text{O}$ and detect its fluorescence among a much higher concentration of $^{127}\text{I}^{16}\text{O}$, as well as $^{127}\text{I}^{17}\text{O}$, and $^{127}\text{I}^{18}\text{O}$. This kind of technology would be of great value in many different areas of work and research, specifically atmospheric studies on global warming.

The Organizers of the 2005 Undergraduate Scholars Day
would like to thank the following persons

Mentors, Chairs and Faculty Advisors

Dr. Irina Khramstova	Psychology
Dr. David Saarnio	Psychology
Patrick A. Stewart, Ph.D	Political Science
Prof. Shelley Gipson	Art
Dr. Rich Grippo	Biology
Dr. Rick Neeley	Communication Disorders
Dr. Chris Edrington	Engineering
Dr. Osabuohein Amienyi	Communications
Dr. Tim Crist	Music
Dr. Cyndy Hendershot	English
Dr. Malathi Srivatsan	Biology
Dr. Amy Pearce	Psychology
Dr. Mary Jackson-Pitts	Radio & Television
Dr. Gil Fowler	The Honors College

The USD would not be nearly as strong and effective a program without the work of these faculty and their aid in students' projects.

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About the artist: Ashley Morgan is a senior in the Department of Art. She will be completing the requirements for a Bachelor of Fine Arts in Studio Art this spring. Her plans are to attend graduate school and pursue a Master of Fine Arts in Painting.

Front cover: Underneath Lies a Flower and Always Blue Leaves
oil and collage on canvas. 2004

Back cover: Self Portrait
ink and wash drawing. 2004



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