

SOUTHWESTERN UNIVERSITY'S

CORE PURPOSE

Fostering a liberal arts community whose values and actions
encourage contributions toward the well-being of humanity.

SOUTHWESTERN UNIVERSITY'S

CORE VALUES

Promoting lifelong learning and a passion for intellectual and personal growth.

Fostering diverse perspectives.

Being true to one's self and others.

Respecting the worth and dignity of persons.

Encouraging activism in the pursuit of justice and the common good.

Undergraduate Research
and Creative Works Symposium
Southwestern University

Program and Abstract of Papers
Volume V

Southwestern University
Georgetown, Texas

April 1, 2004

Members of the Southwestern Community,

We are pleased to welcome you to the fifth annual Southwestern University Undergraduate Research and Creative Works Symposium.

The Delta Alpha Chapter of the Beta Beta Beta Biological Honor Society organized the first symposium in the spring of 2000. The symposium has since developed into an event designed to showcase the unique liberal arts education of Southwestern students. Participation from all academic departments has been emphasized this year, in order to support the University's Core Values. The Undergraduate Research and Creative Works Symposium provides the community with an opportunity to view students' work in many different disciplines. The Symposium also gives Southwestern's students an opportunity to present their work in a collegial conference setting.

The diversity of research projects and creative works included at this year's Symposium is evidence that myriad thought-provoking and challenging experiences thrive at Southwestern. Undergraduate research provides students an opportunity to make contributions in their fields of study. Furthermore, experiences like these enhance academic development. Please join us to support and foster undergraduate research at Southwestern University, which grants students the immeasurable gift of knowledge.

In the spirit of liberal arts tradition, the Symposium features work from more than 18 disciplines and showcases the talents and accomplishments of more than 60 students. The disciplines were intentionally mixed within each session to display the diversity of interests represented by the Southwestern University student body.

We hope you enjoy this year's Symposium.

Sincerely,

Katy Eby and Kimberly Larson
Program Chairs, Undergraduate Research and Creative Works Symposium

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2004 SYMPOSIUM PROGRAM CHAIRS

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Undergraduate Research and Creative Works Symposium Online
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2004 PROGRAM AGENDA

Session I

Location: F.W. Olin Building, Room 105

Moderator: Katy Eby

- 5:00 p.m. 1. **The Economics of Death.**
Amanda Milby, Department of Mathematics and Computer Science,
Southwestern University
- 5:15 p.m. 2. **A Web-based Academic Appeals System.**
Robbie Sternenberg, Sergio Machado, Peter Hubner, Patrick Dossier, Department
of Mathematics and Computer Science, Southwestern University
- 5:35 p.m. 3. **"Learning to Govern:" The Texas Experience.**
Tiffany Barnes, Department of Political Science, Southwestern University
- 5:50 p.m. 4. **Pingueros, Jiniteras, and Chulos: an Evaluative and Comparative Study of the
Influence of Social, Political, and Economic Factors on the Sex Tour Industry and
Prostitution in Cuba, Brazil and Thailand.**
Dana Sanders, International Studies Program, Southwestern University
- 6:10 p.m. 5. **Jessica Lynch: Hero or Victim? A Critical Analysis of the Media Portrayal of the
Jessica Lynch Story.**
Emily Stewart, Department of Sociology and Anthropology,
Southwestern University

Session II

Location: F.W. Olin Building, Room 110

Moderator: Kimberly Larson

- 5:00 p.m. 6. **Assessments of Laterality in Chimpanzees (Pan troglodytes).**
Nicole Buehler, Animal Behavior Program, Southwestern University
- 5:15 p.m. 7. **New Procedure for Assessing Foraging Strategies in Fish.**
Elizabeth Cheaney, Animal Behavior Program, Southwestern University
- 5:35 p.m. 8. **Binding studies of CaM and peptide ligands related to HIV-1gp-160.**
Michael Brinkman, Department of Chemistry, Southwestern University

5:50 p.m. 9. **Chemical Ecology: Using organic Chemistry to Safely Combat a Major Agricultural Pest.**
Kimberly K. Larson, Department of Chemistry, Southwestern University

6:10 p.m. 10. **Taking Aim: The N Generation and Instant Messaging.**
Scott Landon Rocher, Department of Communication, Southwestern University

Session III

Location: F.W. Olin Building, Room 111

Moderator: Hazel Colina

5:00 p.m. 11. **There's 'No-Place' like 'Good-Place;' Analyzing Utopian Elements in Apartheid, South Africa.**
Courtland Quinn, Department of History, Southwestern University

5:15 p.m. 12. **Tha Crossroads: Intersections of Race, Resistance, Commercial Interest, and the Sacred in Rap Music.**
Hazel Colina, Department of Religion and Philosophy, Southwestern University

5:35 p.m. 13. **Public Housing in Georgetown, Texas: Apartments of Shady Oaks and Stonehaven.**
Narda Hernandez, Department of Sociology and Anthropology, Southwestern University

5:50 p.m. 14. **Narcotown, USA: Drug Trafficking on the U.S.-Mexico Border.**
Santiago Guerra, Department of Sociology and Anthropology, Southwestern University

6:10 p.m. 15. **Light Variations of a Quasar.**
Allison Trumble, Department of Physics, Department of Mathematics and Computer Science

Poster and Creative Works Session

Location: F.W. Olin Building, Lobby

6:25-7:00 p.m.

Refreshments served.

Session IV

Location: F.W. Olin Building, Room 105

Moderator: Katy Eby

7:00 p.m. 16. **The Mystery of Faith: The Challenge of Representing Liturgical Theology in Music.**
Johnathan Kana, Department of Music, Southwestern University

7:15 p.m. 17. **Bilingualism in the Actos of El Teatro Campesino: Reflecting and Reshaping Chicano Reality.**
Natalie Goodnow, Department of Theatre, Southwestern University

7:35 p.m. 18. **A Study of Spindle Checkpoint Proteins in Fission Yeast.**
Jill McClain, Departments of Biology and Chemistry, Southwestern University

7:50 p.m. 19. **Gene Therapy and purification of the adeno-associated virus.**
Katy Eby, Department of Biology, Southwestern University

8:10 p.m. 20. **Immediate and Perceived Needs of Residents at Derechos Humanos.**
Ana Villalobos, Department of Sociology and Anthropology, Department of Political Science, Southwestern University

Session V

Location: F.W. Olin Building, Room 110

Moderator: Kimberly Larson

7:00 p.m. 21. **Hofstede's Model for Multinational Organizational Purposes in Spain.**
Marcela Berdion, Department of Economics and Business, Department of Political Science, Southwestern University

7:15 p.m. 22. **Winning Games Versus Winning Seasons: Determinants for Game Attendance.**
Katherine Campbell, Department of Economics and Business, Southwestern University

7:35 p.m. 23. **Finding the American Eve: Voices Outside the Masculine Tradition of the American Novel.**
Ginger Jurecka, Department of English, Southwestern University

7:50 p.m. 24. **"An Emancipated, Intellectualized Bundle of Nerves:" New Woman Identity and Hysteria in 19th Century England.**
Tolly Moseley, Department of English, Southwestern University

Session VI

Location: F.W. Olin Building, Room 111

Moderator: Hazel Colina

7:00 p.m. 25. **Southwestern University Grading Assistant.**
Natalie Berry, Christy Garcia, Tim Moore, Daniel Gibson, EJ Nonmacher, Department of Mathematics and Computer Science, Southwestern University

7:15 p.m. 26. **Superellipsoids and other 3-D Supershapes.**

Kelson Gist, Department of Mathematics and Computer Science, Southwestern University

7:35 p.m. 27. **Economy, Ecology, and Pentecostalism on the US/Mexico Border.**

Kelly Sharp, Department of Religion and Philosophy, Southwestern University

7:50 p.m. 28. **Where Have All the Prophets Gone?**

Paul Maletic, Department of Religion and Philosophy, Southwestern University

ORAL PRESENTATIONS

1. *The Economics of Death.*

Amanda Milby, Department of Mathematics and Computer Science, Southwestern University

Mentor: Therese Shelton, Department of Mathematics and Computer Science, Southwestern University

I will model the cost of different scenarios that the body could go through after a person dies. I also will look at the best way to maximize the land of a cemetery.

2. *A Web-based Academic Appeals System.*

Robbie Sternenberg, Sergio Machado, Peter Hubner, Patrick Dosser, Department of Mathematics and Computer Science, Southwestern University

Mentors: Barbara Owens, Department of Mathematics and Computer Science and David Stones, Registrar, Southwestern University

The SU Office of the Registrar needs a more effective way to maintain and to track academic appeals submitted by students. Our team will design a database system that could be used to track all submitted appeals. This system will allow students to check status, and it will allow the Registrar's Office to update appeal status, view past activity and generate reports on appeal statistics. The database will be implemented using MySQL running on a Linux server, with a web interface created with PHP and HTML. Students will access the system using the campus internet, and administration on the appeals will be available only to the Registrar's office. For security purposes, Registrar's Office personnel will be required to log in to the system with a username and password.

3. *"Learning to Govern:" The Texas Experience.*

Tiffany Barnes, Department of Political Science, Southwestern University

Mentor: Tim O'Neill, Department of Political Science, Southwestern University

On January 14, 2003, the first Republican-controlled Texas House of Representatives in 130 years was sworn into office. The Texas House of Representatives has been a bipartisan legislature since

the 1970s. The 78th Legislature could shift to a partisan House should party ideologies begin to trump bipartisan cooperation.

This study centers on the 2003 session of the Texas House and explores how fundamental norms, procedures, and rules may have changed and how the two parties organized themselves. Emphasis is placed on qualitative measures of norms, rules and procedures using a combination of participant-observation and elite interviews.

The emphasis on norms, rules and procedures is standard within the study of both national and state legislatures. Legislatures are institutions, and as institutions the members are molded by the rules and procedures that determine how winners and losers are determined. Such an approach does not ignore the role of ideologies, interests, or partisan loyalties. But these individualistic factors play out within the context of written and unwritten rules about appropriate behavior, what constitutes a sensible argument, and what constitutes a winning outcome

"Learning to Govern: The Texas Experience" focuses on the changes that were wrought within the Texas House of Representatives as the Republican Party became accustomed to being the majority party and the Democrats became accustomed to being the minority party. This research analyzes on the shifts of each party's position by identifying the crucial "players" in this transition, ideological beliefs and material interests at play and examining how old rules and procedures changed as new rules and procedures develop. In brief, what are the significant changes and continuities in the Texas House as the parties shift their positions?

4. *Pingueros, Jinitas, and Chulos: an Evaluative and Comparative Study of the Influence of Social, Political, and Economic Factors on the Sex Tour Industry and Prostitution in Cuba, Brazil and Thailand.*

Dana Sanders, International Studies Program, Southwestern University

Mentor: Janet Adamski, Department of Political Science, Southwestern University

In this project, I will use the distinct case studies of the metropolitan areas of Thailand, Cuba, and Brazil to evaluate the contributing domestic, social, political, and economic stressors/factors that impact growth of sex tourism and prostitution. Through articles, books, and state reports on human trafficking, I intend to uncover the primary factors behind the continuing growth, or lack thereof, in the sex industry of the three countries. Further, I also will compare the way each country's government has regulated and enforced laws against sex tourism and domestic prostitution.

5. *Jessica Lynch: Hero or Victim? A Critical Analysis of the Media Portrayal of the Jessica Lynch Story.*

Emily Stewart, Department of Sociology and Anthropology, Southwestern University

Mentor: Dan Hilliard, Department of Sociology and Anthropology, Southwestern University

What does it mean to be a hero in America today? The way that the Jessica Lynch story was portrayed to the American people, both in news articles and in television, illustrated a new definition for the word. Previous research has shown that journalists use frames in order to organize and give meaning to an event (Gitlin, 1980). This study compares the way The Washington Post initially framed the Jessica Lynch story to how the interview with Diane Sawyer seven months later framed the story. The data show that by using a standard victim story line to frame the Jessica Lynch story, reporters

depicted her as a victim and a hero. However, as a victim of war, Lynch suffered for America and managed to survive. It is her struggle for survival that supports the new definition of a hero: any American, who is willing to risk their life and suffer for their country.

6. *Assessments of Laterality in Chimpanzees (Pan troglodytes).*

Nicole Buehler, Animal Behavior Program, Southwestern University

Mentor: Steven J. Schapiro, University of Texas M.D. Anderson Cancer Research Center and Southwestern University

Like humans, chimpanzees display handedness when performing a variety of tasks, a finding potentially indicative of hemispheric specializations or laterality that may be (qualitatively) similar to those seen in humans. Unlike humans, however, chimpanzees do not display the strong population bias toward right-handedness evident in most human populations, as seen in previous studies that focused on feeding-related assessments of handedness. To investigate this area of research further I examined a wide variety of tasks in an attempt to assess additional dimensions of laterality and therefore a broader range of brain functions, specifically those related to grooming, gesturing, and locomotion.

I observed more than 120 chimpanzees and recorded the hand(s) they used to 1) groom one another, 2) gesture for food from a human, 3) take their initial step when walking, and 4) eat. The data were analyzed to determine whether individual chimpanzees display "handedness", whether there is a population-level bias toward handedness, and whether hand preferences differ across the various tasks.

Individual chimpanzees displayed hand preferences for grooming, gesturing, walking, and bimanual feeding. There also were population-level biases toward right-handedness on the current tasks and there were few differences in hand preferences across the four tasks in this study. However, as stated above, the population-level bias is not 90 percent right handed as it is in humans.

These results, from a variety of mostly non-feeding tasks, provide additional evidence for a lateralization of function in chimpanzee brains. The data suggest that like the human brain, chimpanzee brains have evolved hemispheric specializations for a variety of functions and reasons. Understanding handedness, lateralization, and hemispheric specialization in chimpanzees will enhance our ability to understand not only chimpanzee behavior, but human behavior as well.

7. *New Procedure for Assessing Foraging Strategies in Fish.*

Elizabeth Cheaney, Animal Behavior Program, Southwestern University

Mentor: Jesse E. Purdy, Department of Psychology, Southwestern University

Previous work in our lab (Purdy, Ravert, & Morrison, 1990; Purdy & Perz, 1991; Purdy & Bales, 1992; Purdy, Roberts, & Roberts, 1994) examined foraging strategies in fish using operant conditioning procedures modeled after experiments by Fantino and Abarca (1985). In these studies, goldfish (*Carassius auratus*) or carp (*Carpio carpio*) produced with equal probability opportunities for food rewards that were associated with delays of varying length. In general, the results were consistent with Fantino's delay reduction hypothesis and the optimal diet model. However, it was possible that fish were more likely to swim around the tank during long delays to food and to stay near the target during short delays to food. This would result in greater rejection rates during long-delay reward

opportunities and could account for these findings.

The present experiment utilized a yoked procedure to control for this possibility. Six koi (*Cyprinus carpio*) were trained to target strike for a food reward. Following shaping, discrimination training was provided in which the master fish was required to strike the target once to produce with equal probability either a short-delay or a long-delay reward opportunity. Once performance was stable, the photocells were activated and master fish could reject the opportunity by passing through the light beam twice. Koi lived in the operant tank 24 hours per day.

Once the master fish were reliably rejecting long-delay reward opportunities and accepting short-delay reward opportunities, the final phase began. A two-minute delay was inter-positioned between rejecting the opportunity and the possibility for producing a new opportunity for food. This was to increase search cost so the fish would increase acceptance for long-delay opportunities. Preliminary analyses reveal that master fish produced opportunities for reward, they rejected long-delay opportunities significantly more than short-delay opportunities, and increasing search cost increased acceptance for long-delay rewards.

8. *Binding studies of CaM and peptide ligands related to HIV-1gp-160.*

Michael Brinkman, Department of Chemistry, Southwestern University

Mentor: Dr. Kerry Bruns, Department of Chemistry, Southwestern University

Peptide ligands for calcium-calmodulin (CaM) were identified by phage display, using agarose-immobilized calmodulin from bovine brain. One of the peptides selected from the library (Serpep) exhibited a high degree of sequence identity with gp160, the SIV and HIV coat glycoprotein precursor. A specific interaction between Serpep and murine recombinant CaM was confirmed by analytical ultracentrifugation and isothermal titration calorimetry (ITC), using a synthetic preparation of the peptide.

The ITC analysis revealed that two mols of Serpep were bound, with differing affinities, per mol of CaM. Several variants of Serpep displayed comparable behavior. Recently, the interaction between CaM and the synthetic HIV-1 peptide spanning residues 216 to 226 (HIV216) was examined. Although the binding stoichiometry was likewise 2:1, the association constants (k_a) were approximately an order of magnitude lower. Differences in helical propensity may contribute to the disparate CaM affinities of Serpep and HIV216.

9. *Chemical Ecology: Using Organic Chemistry to Safely Combat a Major Agricultural Pest.*

Kimberly K. Larson, Department of Chemistry, Southwestern University

Mentor: Frank S. Guziec, Department of Chemistry, Southwestern University

Research completed at Universiteit van Amsterdam

The most destructive pest to the world's potato crop is the potato cyst nematode, which is responsible for annual losses in yield of 10 percent. Controls against this have so far been limited to chemical treatments; however, governmental controls have severely restricted the use of these chemical agents due to negative impact on the environment.

Research was thus intensified to investigate the possibility of a more environmentally friendly method for controlling the potato cyst nematode. In 1986 Dutch researchers identified the nema-

tode's hatching agent as solanoeclepin A. Upon elucidation of the structure of solanoeclepin A at the University of Amsterdam, researchers were able to undertake the challenge of synthesizing this architecturally complex compound. Successful synthesis of this natural product will provide a safe and effective method for protecting the potato plant from its nematode pest. Details of key steps towards the synthesis of solanoeclepin A will be presented.

10. *Taking Aim: The N Generation and Instant Messaging.*

Scott Landon Rocher, Department of Communication, Southwestern University
Mentor: Bob Bednar, Department of Communication, Southwestern University

From the throngs of 80's angst and baby boomer homes emerged a new generation. What Don Tapscott (1998) calls the "Net Generation" has come to represent 30 percent of the world population, a formidable force to be recognized in most realms of world affairs. As unique as the N-geners are, it's their embrace of interactive media that sets them apart socially from generations past. Simply put, they are growing up in radically different ways than the generations which came before them. This project brings voice to N-geners as they emerge from adolescence into adulthood. Using documentary film techniques, over 20 individual N-geners were interviewed about their instant messaging and online communication experiences. In the format of a film and accompanied critical essay, "Talking AIM" weaves the powerful stories of the Net Generation into a narrative that reveals how instant messaging has changed the way we communicate. For the symposium, a shortened version of the film will be screened followed by a Q&A session with the filmmaker.

11. *There's 'No-Place' like 'Good-Place,' Analyzing Utopian Elements in Apartheid South Africa.*

Courtland Quinn, Department of History, Southwestern University
Mentor: Thom McClendon, Department of History, Southwestern University

On May 26, 1948, the Afrikaner supported National Party assumed governmental control over South Africa. This was accomplished under the watchword 'apartheid,' which in literal translation equaled 'separateness.' After roughly a 46 year tenure, the complex and evolving policies of 'apartheid' entailed changes, reflected ideologies, and embodied aspirations which have come to represent a severe epoch of white supremacy in one sense, and tempered human resistance in another. The aim of my research is to analyze the various movements, events, and reactions within the apartheid scope through the lens of utopian theory, writing, and movements. I will emphasize the 'Bantustans' or forced 'homelands' in my study, positing their existence as an example of an actualized 'utopian inversion.' In the end, I hope to present an image of the meeting place between the richness and depth of utopian theory, and the utter magnitude and intrinsic revelations of South African history.

12. *The Crossroads: Intersections of Race, Resistance, Commercial Interest, and the Sacred in Rap Music.*

Hazel Colina, Department of Religion and Philosophy, Southwestern University
Mentors: Elaine Craddock and Laura Hobgood-Oster, Department of Religion and Philosophy
and Melissa Johnson, Department of Sociology and Anthropology, Southwestern University

The attitudes and images presented in American rap and Hip-Hop music, especially the "gangsta" variety, have spurred widely varied scholastic and popular reactions and have inspired heated discourse about the concepts of performance, authority, reception and resistance in our culture. This presentation will explore some of the ideas that have emerged within this discourse, and introduce some of the challenges faced by those who study the music. With that caveat, we will specifically examine the religious images put forward by this music, and discuss how they resonate both as productions of resistant African American voices, and products consumed and understood largely out of context.

13. *Public Housing in Georgetown, Texas: Apartments of Shady Oaks and Stonehaven.*

Narda Hernandez, Department of Sociology and Anthropology, Southwestern University
Mentor: Maria Lowe, Department of Sociology and Anthropology, Southwestern University

The researchers of this project initiated a study investigating the needs of residents at two government-funded housing complexes in Georgetown, Texas. By conducting questionnaires on both neighborhoods and then selecting surveyed residents for an in-depth, structured interview, the sociologists uncovered a variety of the residents' concerns and suggestions for improvement in their communities.

Although there is extensive research on government housing assistance, this study is unique because it analyzes how social institutions determine an individual's strength of identification with the community, the development of fear of crime, and a community's increasing desire for security. The findings that the researchers collected were that more of Stonehaven residents than Shady Oaks respondents felt secure when alone in their home; however, more of Shady Oaks respondents than Stonehaven residents felt secure when walking alone at night. This can be further explained by the conditions of crime at each government housing complex. The present study is intended to voice the opinions of public housing residents, to learn about and compare the government housing apartment complexes, and to increase the amount of resources that these residents have in order to facilitate a better life.

14. *Narcotown, USA: Drug Trafficking on the U.S.-Mexico Border.*

Santiago Guerra, Department of Sociology and Anthropology, Southwestern University
Mentor: Melissa Johnson, Department of Sociology and Anthropology, Southwestern University

There has been a recent push within academia to conduct research regarding border studies, but the issue of drug trafficking has not yet been addressed with the same fervor as topics such as migration, bicultural studies, bilingual education and linguistic patterns.

However, the presence of drug trafficking on the border has greatly affected the lives of border inhabitants. Moreover, the attention given to the problem of drug trafficking into the United States has for some time now gained national media attention, meriting the production of television news exclusives and newspaper headlines. In Starr County, the area of my research, the drug subculture is a central feature of everyday life and weaves many border inhabitants into the complex web of international drug trafficking and consumption. My interest in this project comes from my personal relation to individuals who have at some point in their lives been involved in the practice of drug trafficking. The aim of my project is to present their stories, and to try to explain the social pressures that push

individuals to participate in the drug trade and the ways in which the fear and violence of drug trafficking in the border region affects the lives of border inhabitants.

15. *Light Variations of a Quasar.*

Allison Trumble, Department of Physics, Department of Mathematics and Computer Science, Southwestern University

Mentor: Mark Bottorff, Department of Physics, Southwestern University

Quasars (quasi-stellar radio objects) have fascinated astronomers since their discovery in the 1960s. These objects are ultraluminous, often outshining all the stars in their residing galaxy by factors of thousands. Remarkably, the energy is emitted from a region less than a light year across. The current paradigm is that a quasar is a supermassive black hole surrounded by an accretion disk. Light is released from the accretion disk as matter spirals into the black hole. Because of a quasar's relatively small size, disturbances cause variations in quasar brightness on timescales of one to 100 days. Observing the variations has proved useful in understanding the structure of quasars since they cannot be directly resolved using telescopes.

Thanks to a generous Mundy grant, student Allison Trumble, James Friedrichsen, and Mark Bottorff, were able to initiate a quasar monitoring project with Southwestern University's new 16" telescope. The first observation campaign was carried out during the fall semester of 2003. Several observations per week were obtained including nine weeks of images of the quasar Markarian 335. Differential photometry, in which the brightness of a quasar is compared to non-varying field stars, in the wavebands B (blue) and V (green), were obtained for each observing session. The result is two light curves, in B and in V, which reveal the activity of Markarian 335 during this time. In this presentation we will present the results of our observations and discuss the observation program we have begun.

16. *The Mystery of Faith: The Challenge of Representing Liturgical Theology in Music.*

Johnathan Kana, Department of Music, Southwestern University

Mentors: Lois Ferrari, Department of Music and David Polley, Department of Fine Arts, Southwestern University

The simple, yet profound Mystery of Faith is contained in three acclamations: Christ has died; Christ is risen; Christ will come again. Within this simple phrase lies the heart of Christian theology—the redemptive power of Jesus' death, the fulfillment of Scriptural prophecy in the resurrection, and the hope of eternal salvation through Christ. The biblical story of Jesus' life provides a framework within which this liturgical phrase takes its rightful place.

Specifically, the narrative includes the passion and death of Jesus, followed by the mysterious approach to the tomb on Easter morning and the joyous news of Jesus' resurrection. A time of excited confusion follows, and then comes the state of assurance in which the church of the New Testament was founded—a time in which we, too, live and await the triumphant return of the Christ. *Mysterium Fidei* is an original 6-1/2 minute work for symphonic woodwinds that I composed during a period of approximately six months. The composition attempts to capture the essence of this liturgical theology within a musical context. A single theme is developed throughout, remaining unchanged in melodic and rhythmic

proportion yet changing character in the midst of its surrounding textures and harmonic contexts. The piece, which will be premiered on April 4 by the University Wind Ensemble, is an idiomatic work for woodwinds and represents one of the most complex pieces of music I have ever composed.

17. *Bilingualism in the Actos of El Teatro Campesino: Reflecting and Reshaping Chicano Reality.*

Natalie Goodnow, Department of Theatre, Southwestern University

Mentor: Sergio Costola, Department of Theatre, Southwestern University

This is an investigation into why El Teatro Campesino chose to present its actos using a mixture of English and Spanish and, in particular, what function that bilingual dialogue serves within the actos. Analysis of several actos, *Las Dos Caras del Patroncito*, *Quinta Temporada*, *Los Vendidos*, *La Conquista de Mexico*, *No Saco Nada de la Escuela*, *Huelguistas*, *Vietnam Campesino*, and *Soldado Razo*, in addition to research concerning the nature of bilingual discourse in the American Southwest indicates that this unique mixture of English and Spanish, though partly a matter of necessity for El Teatro Campesino, serves several other purposes as well. It reflects the reality of the Chicano people, their power struggles and identity crises, through humor and characterizations, but also is used as a tool to change that reality.

The inclusion of both English and Spanish vocabulary provided El Teatro Campesino more opportunities for humorous wordplay, and also allowed the group to develop simple, direct characterizations along with more subtle ones with a great deal of precision due to the specific nuances associated with each language. El Teatro also used bilingual discourse in order to propose a new social vision, one in which Spanish-speaking or bilingual Chicanos do not view their language and their heritage as marks of shame, but instead as sources of power, identity, and pride. Additionally, El Teatro used varying English and Spanish names and labels to demonstrate the effect that language choice can have on a Chicano's identity.

Ultimately, the function of language variety in the actos is analogous to the function of the actos themselves in Chicano society: to simultaneously reflect and reshape the social reality of the Chicano.

18. *A Study of Spindle Checkpoint Proteins in Fission Yeast.*

Jill McClain, Departments of Biology and Chemistry, Southwestern University

Mentor: Shelly Sazer, Department of Cell and Molecular Biology and Biochemistry, Baylor College of Medicine

The spindle checkpoint plays a crucial role in ensuring proper chromosome segregation during cell division. If microtubules do not properly attach to the kinetochores of all chromosomes during metaphase, the spindle checkpoint initiates a cell cycle delay until the defect is repaired. I used the fission yeast *S. pombe* to study the spindle checkpoint. Several proteins essential to the checkpoint have already been identified, but genetic evidence indicates not all components of the pathway have been found, and the biochemical function of all known proteins has not yet been determined.

One major goal of my project was to identify novel checkpoint mutants from a pool of chemically mutagenized strains. Checkpoint mutants are characterized by their sensitivity to the microtubule destabilizing drug thiabendazole (TBZ), which interferes with microtubule binding to kinetochores,

and by their failure to arrest the cell cycle when *mph1*, an upstream checkpoint component, is over-expressed. I identified two strains that fit these criteria and may represent novel checkpoint mutants because the mutations are not linked to a known checkpoint gene.

In other organisms, it has been shown that the homolog of the checkpoint protein Mph1p acts upstream of two branches of the spindle checkpoint pathway: (1) the metaphase to anaphase transition, described above, and (2) the septation pathway. To test the hypothesis that Mph1p acts upstream of these two pathways in *S. pombe*, *mph1* was overexpressed in cells that were missing *mad2*, an essential component of the metaphase to anaphase checkpoint, or *dma1*, an essential component of the septation pathway. DNA was visualized using the fluorescent dye DAPI, spindles were visualized using GFP-tubulin, and cell walls were observed using the fluorescent dye calcofluor to identify cells arrested in metaphase or septating cells. When compared to wild type cells, the decrease in metaphase arrested cells in the *mad2* null strain and the decrease in septation in the *dma1* null strain indicates that Mph1p does act upstream of both pathways.

19. *Gene Therapy and purification of the adeno-associated virus.*

Katy Eby, Department of Biology, Southwestern University

Mentor: Martin Lock, James Wilson, Division of Medical Genetics, University of Pennsylvania

Research is being conducted on the use of adeno-associated viruses (AAV) as gene therapy vectors for diseases such as cystic fibrosis (CF) and alpha-1 antitrypsin deficiency (AAT). AAV is advantageous for gene therapy because of its high efficiency of transduction, as demonstrated in CF patients as well as AAT murine models. There is encouraging evidence for the use of newly discovered serotypes AAV-7 and AAV-8 as vectors in gene therapy because when tested against heterologous antisera neutralizing antibodies were scarce in humans. The clinical testing of adeno-associated virus vectors requires purification of large quantities that would not prove practical using current methods. We endeavored to formulate a new scalable method for the purification of AAV-7 & AAV-8 in sufficient quantities.

We chose to create a scalable purification method for these novel serotypes using ion-exchange column chromatography. Based on ion exchange resins used for other serotypes of AAV, we performed gravity flow screening on 0.5 mL columns of both cation and anion-exchange resins. The following resins were screened: Poros 50 PI, Fractogel EMD TMAE, Fractogel EMD DEAE, Fractogel EMD S03, SP Sepharose HP, and Source 15Q. We obtained quantitative data from our column fractions using transduction assays with the 8-31 cell line and real-time PCR. Based on the elution profiles of AAV-7, we believe that tandem chromatography using Poros 50 PI and Source 15Q resins may be a viable process, while for AAV-8, Poros 50 PI resin and Fractogel DEAE are promising candidates.

20. *Immediate and Perceived Needs of Residents at Derechos Humanos.*

Ana Villalobos, Department of Sociology and Anthropology, Department of Political Science, Southwestern University

Mentor: Melissa Johnson, Department of Sociology and Anthropology, Southwestern University

The focus of my research was to examine and analyze the work of American Christian Missionary Groups and their effectiveness in Derechos Humanos. Through the interviews I hoped to

find out what those NGO's (non-governmental organization) viewed as being the immediate needs of Derechos Humanos, how they went about in fulfilling the colonia's needs and their success. I also wanted the opinion of colonia residents in regards to the work of NGO's and how they felt about their presence in Derechos Humanos. I wondered if there was a possibility that the needs perceived by the NGO's were different than the actual needs of those living in the colonia. As was expected, all of the motivations driving these individuals to partake in this missionary trip were directly related to God and their own values as Christians. Most claimed that their intent was not to arrive and do what they willed, but rather to listen to what the community wanted (as well as God's will). The question of who constituted such community arose several times. The NGO's and colonia residents had different ideas of who formed this "community", thus resulting in dissatisfaction amongst residents as to who had a home built.

Colonia residents differed in their views of these missionary groups but nonetheless appreciated the homes and resources brought forth by such groups. Originally I assumed that one major need the residents felt needed to be addressed would be the canal. Yet when I conversed with residents none brought it up in conversations.

21. *Hofstede's Model for Multinational Organizational Purposes in Spain.*

Marcela Berdion, Department of Economics and Business, Department of Political Science, Southwestern University

Mentor: A.J. Senchack, Department of Economics and Business, Southwestern University

Social science theories reflect the national culture from which they originate. Therefore, US multinational organizations must modify (mostly Americanized) theories before applying them in another host country.

This study describes the use of Geert Hofstede's model for successfully accomplishing organizational objectives in different cultural settings.

This research then analyzes the differences between Spanish and American cultures by comparing the index values from Hofstede's Five Dimensions of National Culture. Finally, the implications of the findings for creating culture-adjusted management and organizational objectives are explored.

22. *Winning Games Versus Winning Seasons: Determinants for Game Attendance.*

Katherine Campbell, Department of Economics and Business, Southwestern University

Mentor: Richard Prisinzano, Department of Economics, University of Texas

This paper discusses the relative importance of absolute and relative quality on baseball attendance. The motives behind fan attendance at games are important to understand for attendance ultimately drives team profits. The research here finds that absolute quality, the team's winning percentage for the season so far, is more important than relative quality, that particular games' predicted outcome, to fans in deciding whether or not to attend baseball games.

23. *Finding the American Eve: Voices Outside the Masculine Tradition of the American Novel.*

Ginger Jurecka, Department of English, Southwestern University

Mentor: Elisabeth Piedmont-Marton, Department of English, Southwestern University

Since the 1970s there has been a movement in American literary study to carve a niche in critical thought, and in the American literary canon for voices outside of the masculine literary tradition. Feminist scholars have attempted to recover repressed voices of the authorial American Eve, giving the canon an infusion of the feminine-authorial perspective that were hushed to a low murmur. Many feminist critics, as well as non-feminist critics, would have a mixed response to the success of attempts to find an equal feminine voice in the American literary canon. Thus, the American Eve that feminist critics should search out is not a mythical female character comprised of a specific set of qualities asserting her "Americanness" while, hiding loose in American fictional wilds. Rather they should seek an authorial female voice or, even better, set of female voices that are able to function within the canonical system. Specifically, female textual voices equal to the plethora of masculine voices that create the American literary Adam.

I argue that Kate Chopin's *The Awakening* and Ellen Glasgow's *The Sheltered Life* are parts of an emergent American literary Eve. However, these texts thwart as well as embody the efforts of feminine textuality. In examining what feminine perspectives are missing from these texts, one can predict the next textually progressive step for establishing an American Eve equal to the entrenched Adam. I venture that Caroline Lee Hentz's *Linda*; or *The Young Pilot of the Belle Creole* is the next evolutionary step for the feminist, as well as American, canon due to its perspective on female roles and relationships to morality, physical beauty and the possibility of implementing a female individualism and adventurousness.

24. *An Emancipated, Intellectualized Bundle of Nerves: New Woman Identity and Hysteria in 19th Century England.*

Tolly Moseley, Department of English, Southwestern University

Mentor: Eileen Cleere, Department of English, Southwestern University

Emerging in England towards the late 19th century, the "Woman Question" was arguably a set of destabilizing questions surrounding the nature and role of woman. Preceded by several advances in women's rights, such as the 1882 Married Women's Property Act, increased employment opportunities for women, and the formation of several women's suffrage societies, the New Woman—a literary and social figure—came to embody an independent feminist female who rejected the Englishwomen's exalted domestic station. In all of her guises, the New Woman changed the way England viewed social institutions once taken for granted: marriage, education, even dress code.

Satire magazines of late 19th century England such as *Punch* tended to depict the New Woman as intellectual, fiercely independent, eschewing the fripperies of fashion for more masculine dress, and above all, singular in her purpose. However, in many anti-feminist as well as pro-New Woman literary works—not to mention in the lives of actual feminists, such as Eleanor Marx and Olive Schreiner—this female is much less decisive about the new freedoms afforded women, and continually grapples with feminist issues of the day. Is a sexual free union really desirable to monogamous marriage? Is grueling labor in a textile factory much more favorable than the gentler work of a governess?

Perhaps more disturbingly, the New Woman is frequently represented as psychologically precarious by her opponents and her supporters, suffering depression and mental breakdown. Do fits of psychological instability reduce the New Woman to her old cliché—an object of feeling—or rather, signal an important rupture in collective women identity? In other words, is the New Woman's hysteria on an individual level symptomatic of collective progress—the purging of one woman's hegemonic identity as an analogue to eroding control of the female on a societal level?

My research focuses on the literary representation of the New Woman, specifically employing works by George Egerton, George Gissing, Sarah Grand, Thomas Hardy, Olive Schreiner, and Bram Stoker. Examining the notions of space, reading, and cross-dressing in these novels, I theorize that while New Woman literary advocates expropriate hysteria—too often the stereotypical trope of the Victorian woman is seen as a subversive tool for social change.

25. *Southwestern University Grading Assistant.*

Natalie Berry, Christy Garcia, Tim Moore, Daniel Gibson, EJ Nonmacher, Department of Mathematics and Computer Science, Southwestern University

Mentor: Barbara Boucher Owens, Department of Mathematics and Computer Science, Southwestern University

The Southwestern University Grading Assistant is a web-based grade book for recording and computing grades. Individual professors have the capability to create new classes, edit existing classes, and generate individual and class score reports. Additionally, students will have the ability to view their individual score reports throughout the duration of the course via the Internet. All class information will be stored in a database accessible only to the professors using the software, whereas students will only have the ability to view and not alter their individual information. This project is being developed by a group of students in the senior software engineering capstone course for use by Cameron Sawyer in the mathematics department. Potentially, other professors and departments on campus could also use the product. The project was modeled based on the Grader-Aider software for DOS.

26. *Superellipsoids and other 3-D Supershapes.*

Kelson Gist, Department of Mathematics and Computer Science, Southwestern University

Mentor: Suzanne Buchele, Department of Mathematics and Computer Science, Southwestern University

Inventing the Circle: The Geometry of Nature (2003), by Johan Gielis, offers a mathematical formula, called the superformula, based on the structure of the superellipse, which is capable of describing a vast multitude of geometric shapes in two-dimensions. This formula is capable of producing the simple geometric shapes seen in everyday life, such as circles, squares, pentagons, and octagons, as well as shapes that closely mimic many natural objects, including eggs, starfish, and flower petals. The superformula could prove to be a valuable tool in realistic modeling of both two- and three-dimensional objects in the realm of mathematics and computer science. The strength of the superformula lies in the small number of parameters in the formula, which can define a great number of shapes.

An extension of this formula into three dimensions provides an even greater potential for description of shapes. By combining multiple shapes defined by the superformula, a variety of com-

plex three-dimensional shapes can be modeled. The presentation will demonstrate some of the applications for the superformula in three dimensions and some of the complex shapes that may be modeled with only a few parameters.

27. *Economy, Ecology and Pentecostalism on the US/Mexico Border.*

Kelly Sharp, Department of Religion and Philosophy, Southwestern University

Mentors: Laura Hobgood-Oster and Elaine Craddock, Department of Religion and Philosophy, Emily Niemeyer, Department of Chemistry, and Melissa Johnson, Department of Sociology and Anthropology, Southwestern University

Scholars of religion have taken notice in the exponential growth of Pentecostalism in Latin America during the past 50 years. In Mexico, this growth rate deserves attention because of its magnitude, and due to its presence in a country long considered to be one of the anchors of Catholicism in Latin America. My thesis, based on two summers of research in Derechos Humanos—a colonia in Matamoros, Mexico—explores reasons for the popularity of Pentecostalism on the US/Mexico borders. These reasons are two-sided: on the one hand I describe contextual factors—cyclical poverty, environmental degradation, and a particular burden on women—that create a need for a responsive spiritual movement, and on the other I describe characteristics of Pentecostalism—charisma, healing, and acceptance of plurality—that answer this need.

Although the border has as many elements to its character as any other place, the three that stuck out most to me during ethnographic and written research as elements inspiring Pentecostal growth were the following: political/economic injustice and helplessness, environmental destruction, and a particular burden on the women who represent an overwhelming percentage of the religious community, Catholic and Pentecostal alike. I will discuss the role of NAFTA and borderland dynamics in creating and coloring this situation, especially as it pertains to life in Derechos Humanos.

Having discussed the context in the colonia and identified a need for an actively responsive spiritual movement, I will discuss those elements of Pentecostalism—charisma, healing, and plurality—that make it especially amenable to the situation in Derechos Humanos. I will offer a brief historical, theological, and comparative overview of Pentecostalism, but my focus will be on its capacity as a spirituality of resistance in this area. My conclusion thus far is that Pentecostalism—or, “Christianity” as it is known in Derechos Humanos—provides a “sustainable theology;” one that does not overtly fight the status quo, but instead slowly builds influence from the individual outward, strengthening women, communities and, eventually, entire peoples.

28. *Where Have All the Prophets Gone?*

Paul Maletic, Department of Religion and Philosophy, Southwestern University

Mentors: Elaine Craddock, Laura Hobgood-Oster, and David Stewart, Department of Religion and Philosophy, Southwestern University

Prophets were a vital part of the religious and cultural life of Ancient Israel as depicted through the Hebrew Bible. These distinct prophetic roles must have some corresponding piece or pieces in today's religious culture that help to fill a similar role as the prophets of ancient civilizations. Yet unfortunately the prophets of today, if such a cultural figure can be deemed as existing, do not have

the legitimizing force of canonized scripture to retroactively reinforce their minority viewpoints into the majority. Prophets during the time of the Hebrew Bible, though thought of as unpopular and counter-culture during their own time, eventually gained favor and shifted towards a majority perspective shown by the inclusion of prophecy in the Hebrew canon. However prophecy as it might be sought out today, is harder to directly identify with because the categories of canon and scripture have become much less flexible and much more permanent. Thus other methods of communication and culturally relevant ways to establish connection, such as can be found in the language of poetry, become essential for the modern day prophet as he or she seeks to become a vital part of society. This project examines the roles of prophets in the contemporary world through the interpretive lens of prophecy in ancient Israel.

POSTER AND CREATIVE WORKS PRESENTATIONS

29. *Detection of tetracycline antibiotics and tetracycline-resistance genes in surface water and topsoil surrounding livestock operations.*

Jade Hatley, Department of Chemistry, Southwestern University

Mentors: Kerry Bruns and Emily Niemeyer, Department of Chemistry, Southwestern University

Tetracycline antibiotics are added to livestock feed in sub-therapeutic levels to promote enhanced growth. Concerns about their usage necessitate the development of new approaches for monitoring antibiotics entering the environment. Tetracycline antibiotics present in soils can lead to selection for resistant bacteria; these strains have the potential to transfer resistance genes to pathogenic bacteria. For this project, paired samples consisting of surface water and topsoil were collected from county parks in Tom Green County, Texas. Sites were chosen based on proximity to several feedlot and dairy operations in the area. High-performance liquid chromatography was used to isolate tetracycline, oxy-tetracycline, and chlortetracycline from the water samples, and europium-sensitized fluorescence spectroscopy was used for quantification. Bacterial DNA was isolated from the soil samples for use in a polymerase chain reaction analysis to determine the presence/absence of several genes that convey tetracycline resistance (genes for drug efflux pumps and ribosomal protection proteins).

30. *The Effects of Concurrent Articulation on Homophony and Rhyming Judgments.*

Aubrey Buckert, Department of Psychology, Southwestern University

Mentor: Julie Fiez, Departments of Psychology and Neuroscience, University of Pittsburgh

The aim of the present study was to determine the effects of concurrent articulation on homophony, pseudohomophony, and rhyming judgments. In a 3 (Judgment Task: Rhyming, Homophony, or Pseudohomophony) x 2 (Suppression Condition: Concurrent Articulation or No Concurrent Articulation) within-subjects design, six undergraduates (three women, three men) made speeded judgments about a series of word pairs. Half of the word pair judgments were made under concurrent articulation conditions. As predicted from previous studies, the accuracy of homophony

judgments was not affected by concurrent articulation whereas the accuracy of rhyming judgments was significantly affected by concurrent articulation. The accuracy of pseudohomophony judgments, which have not yet been adequately explored in the literature, was also shown to be significantly affected by concurrent articulation. These findings suggest that different mechanisms in phonological coding are used in making homophony and rhyming decisions. Studies of the neural regions used during these tasks using fMRI are currently in progress.

31. *Eating Disorder Traits and Dimensions of Romantic Attachment.*

Brandy Ledbetter, Department of Psychology, Southwestern University

Mentor: Bryan Neighbors, Department of Psychology, Southwestern University

The current study sought to examine the interrelationship among two independent dimensions underlying romantic attachment (avoidance and anxiety) and eating disorder problem dimensions. Participants were 101 female university students ages 18-24, who volunteered to participate after being recruited through a mailed advertisement. Participants completed the Eating Disorder Inventory-2 (EDI-2) and the Experiences in Close Relationships-Revised (ECR-R), and their scores were examined. Five of the EDI-2 subscales revealed statistically significant associations with levels of anxiety, while two of the subscales approached significance for the avoidance dimension. The results partially support the hypothesis that romantic attachment dimensions are related to eating disorder problem dimensions. However, the pattern of intercorrelations suggests that only the dimension of anxiety in romantic attachment is linked to eating related disturbances. This suggests that, in romantic relationships, attachment-related anxiety may be an important factor in the development of eating disordered behaviors.

32. *Attachment and Psychopathology: The Role of Parent and Child Gender.*

Genevieve Pruneau, Department of Psychology, Southwestern University

Mentor: Bryan Neighbors, Department of Psychology, Southwestern University

It is well documented that a secure parental attachment relationship serves as protection against the development of psychopathology. This study explored the relationship between attachment security to mothers and fathers and psychopathology. One hundred and eighty-four students (120 female, 64 male) from a small liberal arts university completed a questionnaire that used the Inventory of Parent and Peer Attachment to measure attachment security to mother and father, and the Brief Symptom Inventory to measure symptoms of psychopathology. Multiple linear regressions, computed separately for male and female participants, revealed that attachment security to parents was significantly related to psychopathology. An unexpected gender difference emerged, such that for men only paternal attachment security was related to psychopathology, whereas for women only maternal attachment security was related to psychopathology. These results are consistent with the emerging body of literature investigating the differential roles of child and parent gender in attachment research.

33. *Whodunit? Attractiveness Stereotypes and Children's Responses to Leading Questions.*

Ashley Still, Kamini Verma, Rebecca Stelter, Department of Psychology, Southwestern University

Mentor: Jacqueline Muir-Broadus, Department of Psychology, Southwestern University

One limitation of a child's memory is their susceptibility to suggestions implied in leading questions (Bruck & Ceci, 1999). For example, when told that a classroom visitor was "clumsy" children were more likely to erroneously assent to leading questions that were consistent with this stereotype (Leichtman & Ceci, 1995). Stereotypes also can be shared culturally, such as the notion: "beauty is good" (Ramsey & Langlois, 2002). This research project was designed to show that children are more likely to assent to suggestive questions about negative events when the presenter is less attractive and that this effect is mediated by individual differences in memory.

Pairs of male or female class visitors who varied in attractiveness made negative suggestive statements as they performed four science demonstrations for seven kindergarten classes. Two weeks later 80 children answered questions about actual events and leading questions about events that did not happen.

Children reported that they had seen an average of 1.5 of the 4 false events about which they were questioned. When asked leading questions about the events, the children were more likely to agree to false suggestions (max. = 11) about the less attractive ($M = 9.40$) than the more attractive ($M = 8.80$) presenters as predicted, but only when the presenters were male. For the female presenters the opposite was found, with children being more likely to agree to the false suggestions about the more attractive ($M = 9.32$) than less attractive ($M = 8.97$) presenters, $p < .08$. With respect to the role of memory, children with more accurate memories for the actual events were less likely to agree to the suggestive questions, $r(75) = -.20$, $p < .08$. These results suggest that children's responses to leading questions are influenced by attractiveness stereotypes and by individual differences in memory.

34. *All of Your Virii Belong to Us.*

Tim Moore and Peter Hubner, Department of Mathematics and Computer Science, Southwestern University

Mentor: Todd Watson, Information Technology Service, Southwestern University

Since November of 2001, all e-mail sent to and from Southwestern University has been scanned for the presence of computer virii. Any detected virus is intercepted and quarantined instead of delivered to the recipient. To date over 300,000 computer virii, trojans, worms, and malicious scripts have been quarantined. We have developed a set of programs to archive representative data collected from the quarantined messages into a database for later statistical analysis. Additionally, we have created a web-based interface for dynamically generating graphical representations of the collected data in a variety of formats. This is essential due to the large amounts of data gathered, which would otherwise be difficult to interpret either whole or in part.

35. *A Cyclic Voltammetric Investigation of Various Amino Acids, Metal Ions, and Other Compounds in a Pyrazole Imidazole Eutectic.*

Harvey Liu, Department of Chemistry, Southwestern University

Mentor: Fred Hilgeman, Department of Chemistry, Southwestern University

Electrochemistry involves the transfer of electrons from one substance to another. This transfer causes the production of a current, whose magnitude can be observed and can give insight into the properties of the substance or compound. Cyclic voltammetry (CV) is a technique used in the study of electrochemistry, more specifically, it is a technique that observes the thermodynamics and kinetics of the electrons in a sample. Cyclic voltammetry is a method of analysis that allows for the study of the electroactivity of the electrons in a sample. It can be used to probe coupled reactions, which can be used to determine the mechanism and rate of a redox reaction. In addition, the surface of the working electrode may also be studied to observe the products of reactions. The most fundamental goal of a CV study is to discover a reversible redox reaction. The analytes that were investigated in this study included various amino acids. Previous works in the laboratory showed that p-aminophenol exhibited reversibility in this pyrazole and imidazole eutectic. This research will research on not only the amino functional group, but will also study the carboxyl as well as the various functional groups on amino acids to see if they may demonstrate similar behavior.

36. *"His and Her" Heart Attacks: The Effects of Perceived Relevance on Women's Perceptions of Heart Disease Risk.*

Abigail L. Riggs, Aubrey D. Buckert, and Erin E. Crockett, Department of Psychology, Southwestern University

Mentor: Traci A. Giuliano, Department of Psychology, Southwestern University

Compared to breast cancer—which receives enormous media attention and is clearly a threat to women—heart disease is perceived as a “man’s” problem, a notion that may be perpetuated by the use of sexist language and an under representation of female sufferers in the media. Thus, the goal of the research was to determine if the use of inclusive language (e.g., he or she) and female examples would increase women’s awareness of heart disease. Data were collected from 98 women (ages 35 - 92) who read a fictitious magazine article about heart disease that varied the gender of the accompanying picture of a survivor and the type of language used throughout the article (exclusive or inclusive). The article was followed by questions assessing participants’ reactions to the article, their perceived risk of experiencing a heart attack, their intentions to engage in future health-related behaviors, and their desire to receive a pamphlet containing more information.

Preliminary analyses revealed that age moderated the results; thus, all analyses were conducted using age as a variable. Our results confirmed that women generally reacted more positively to the female-relevant article (e.g., they thought it was informative, of good quality, and that it increased their awareness of heart disease). Consistent with our predictions, younger women (i.e., those 60 and under) were more likely to request an informational pamphlet after reading a female-relevant article than after reading a male-relevant article. Women older than 60, however, were more likely to request an informational pamphlet after reading the male-relevant article, contrary to our predictions. Future

research needs to further explore age differences in reactions to health-related information; however, it is apparent from the current study that gender representation affects women’s perceptions of their health and thus warrants the attention of those who disseminate health knowledge to women.

37. *Life after college?: How students make their post-graduation plans.*

Sarah Barnett, Nicole Blanchett, and Erin Puckett, Department of Psychology, Southwestern University

Mentor: Jacqueline Muir-Broaddus, Department of Psychology, Southwestern University

“Emerging adulthood” (18-25 years) is a newly identified developmental stage (Arnett, 2000) during which many life-changing decisions are made, such as what to do after graduating from college. The present study was designed to explore the decision-making process related to post-graduation planning and to uncover personality variables that may affect it. Forty-two seniors (16 male, 25 female, 1 undeclared) from Southwestern University completed surveys of their attitudes toward various post-graduation options and their decision-making criteria.

They also completed several demographic and personality measures, including family socioeconomic status, locus of control, optimism, need for closure, and attachment to parents. Findings showed that employment was the most popular post-graduate option ($M = 7.57$, $SD = 3.07$), followed by education ($M = 5.81$, $SD = 3.52$), travel ($M = 3.58$, $SD = 3.34$) and service ($M = 2.31$, $SD = 2.54$). The most important criteria were interest in ($M = 8.52$, $SD = 1.55$), financial considerations ($M = 8.05$, $SD = 1.93$), and qualifications ($M = 7.31$, $SD = 1.97$). Students who reported considering more post-graduate options tended to value financial considerations ($r = .40$) and self-exploration ($r = .353$) more as decision-making criteria. Family income was related to student priorities, such that the lower the family income the more emphasis students place on financial considerations when considering employment as an option ($r = -.33$). Additional data analyses are underway to examine whether students’ decision-making processes map onto formal reasoning models and whether the other individual difference variables also predict decision-making.

38. *The SCHIP Program: Is It As Beneficial As It Seems?*

Laurel Tucker, Department of Political Science, Southwestern University

Mentor: Tim O'Neill, Department of Political Science, Southwestern University

I am conducting a policy evaluation of the Texas State Children’s Health Insurance Program, “The SCHIP Program: Is It As Beneficial As It Seems?” The State Children’s Health Insurance Program (SCHIP) was created by Title XXI of the Balanced Budget Act of 1997. It is a program designed to provide health insurance to children who live in poor working families who would not otherwise receive it. I am using the program in the state of Texas as a case study. Two central questions need to be answered with regard to the SCHIP program. Is the SCHIP program the most effective way to deal with the problem of children’s health? Is the SCHIP program meeting the goals created in the original legislation? Most of my research has come through personal interviews I have conducted around Texas and in Washington, D.C. Along with information drawn from the personal interviews, I am using theories pertaining to public policy implementation and evaluation to explain aspects of the SCHIP program. My findings will show whether or not the program is effective. With regard to the case study, the findings will explain the ramifications of significant changes to the

SCHIP program in Texas.

39. *Determination of phthalate ester concentrations in PET bottles exposed to UV radiation.*

Heather Martin, Department of Chemistry, Southwestern University
Mentor: Emily Niemeyer, Department of Chemistry, Southwestern University

Phthalate esters are commonly used as plasticizers in PVC containers. PET, polyethylene terephthalate, is produced from the polycondensation of terephthalic acid. The phthalate ester plasticizers in PET bottles often leach into the liquid they contain. A variety of potential hazards, including reproductive toxicity and teratogenesis, have been associated with many phthalates, in particular Di-(2-ethylhexyl)phthalate (DEHP) and Butyl benzyl phthalate (BBP). Many other phthalate esters are under current investigation for toxicological effects. Previous studies have determined that an increase in temperature of bottled water in a PET container increases the concentration of phthalate esters released into the bottled water. PET bottles are frequently exposed to ultraviolet (UV) light and so in response to increased bottled water consumption and use of PET bottles in the U.S., combined with the potential risk of increased phthalate exposure, this study attempts to quantify a variety of phthalate esters leached from PET bottles after exposure to UV light. Using solid-phase extractions, coupled with gas chromatography-mass spectrometry (GC-MS), we have determined the various phthalate ester concentrations in the bottled water as a function of UV light exposure.

40. *Pink Slips and Black Cats: The Relationship Between Stress and Superstition.*

Erin E. Crockett and Abigail L. Riggs, Department of Psychology, Southwestern University
Mentor: Traci Giuliano, Department of Psychology, Southwestern University

Research has linked stress with a number of different health problems (e.g., obesity, memory loss, and depression), making it a major health concern. (Griffin & Holmes, 1998). Powers et al. (2002) found that stress is particularly harmful to people who use avoidant coping strategies. Because avoidant coping strategies are potentially harmful, it is important to identify when people are using such strategies. On the assumption that superstitious beliefs are a type of avoidant coping strategy, the current study used a correlational approach to explore the relationship between superstitious beliefs and stress. A convenience sample of 118 undergraduate students (62 women and 56 men) at a small, private liberal arts university in Texas completed a questionnaire that measured demographic characteristics, superstition, and perceived stress. Items assessing superstitious beliefs were adapted from the Paranormal Belief Scale (Tobacyk & Mildford 1983); items measuring stress were taken from the Perceived Stress Scale (Cohen, Kamark, & Mermelstein, 1983). As predicted, the results revealed a significant positive relationship between superstition and stress, $r(116) = .26, p = .005$. Our results are consistent with previous research conducted during the Gulf War showing that people who lived in high-combat areas reported more magical thinking (Keinan, 1994). Keinan (1994) presents three reasons for this correlation. First, stress may cause regression back to childhood, a time when magical thinking is more common. Second, individuals may use magical thinking to attain personal control. Finally, an information processing approach suggests that stress affects the allocation of cognitive resources. Future research should further investigate the cognitive processes that are involved in stress

and superstition (e.g., determining whether the illusion of control created by superstitious beliefs is beneficial). Moreover, future research should further explore the relationship between stress and superstition in order to better equip individuals to cope with anxiety-provoking situations.

41. *Abiotic and biotic influences on Apple Snail life history.*

Rebecca K. Marfurt, Department of Biology, Southwestern University
Mentor: Romi Burks, Department of Biology, Southwestern University
Recently, the state of Texas recognized that the channeled applesnail (*Pomacea canaliculata*) may

dramatically impact many South Texas estuaries. This invasion poses a serious threat to native ecosystems and biodiversity. Applesnails are voracious eaters and serve as intermediate hosts for various diseases. Rice paddies and small freshwater ponds may be more susceptible to invasion as snail populations flourish where macrophyte abundance is high. Although the impacts of applesnails may be substantial, management efforts suffer from the lack of basic ecological data.

Salinity in East Texas estuary systems fluctuates widely, ranging from 1.4 parts per thousand to as high as 20ppt (seawater is typically 35ppt). Because *Pomacea canaliculata* only recently invaded Texas estuaries, the impact of extreme salinity conditions on the snail is not known. We tested the impact of four levels of salinity on snail mortality and body mass. Adult snails tolerated salinity levels as high as 8 parts per thousand. The higher levels (20ppt and 35ppt) led to snail mortality within 24 hours, suggesting that salinity did significantly affect mortality at the higher treatments (1-way ANOVA and post-hoc tests, $p < 0.05$). Weight change did not differ between the treatments (t-test, $p = 0.XX$).

Besides abiotic factors such as salinity, biotic factors, such as predators, may also impact applesnails. Through natural processes (i.e. excretion, defecation, molting), different aquatic organisms release chemicals (i.e. kairomones) into the water. These chemicals send signals to other organisms, and trigger predator-avoidance behaviors, such as burying by hatchlings, when sensed by prey organisms. Our future experiments will test which possible predators elicit this behavior in applesnails by observing the reaction of the hatchlings when exposed to the chemical cues from possible bayou predators including crayfish, sunfish, turtles, and maybe even alligators. More inquiries into the basic ecology of these applesnails will lead to better management efforts.

42. *Affect and Performance of Collegiate Swimmers During an Intensive Training Period.*

Jessica Lovorn, Department of Psychology, Southwestern University
Mentors: Scott P. McLean, Department of Kinesiology, Southwestern University and John Bartholomew, University of Texas at Austin

Staleness, a physiological product of over-training, may result in a negative shift in the affective state of the athlete. A successful period of over-training should be accompanied by affective recovery in addition to physiological recovery as indicated by a return to or above pre-training performance levels. PURPOSE: To assess the effect of over-training on affect and performance during a seven day period in 18 collegiate swimmers (age = 19). METHODS: The affect grid was used to assess two dimensions of affect, pleasure-displeasure and arousal-sleepiness, prior to each training session. Performance was measured using a maximal effort 100-m freestyle swim. Performance tests were

completed at the beginning, midpoint and end of the training period. Changes in affect were assessed using 7 X 2 (day X affective dimension) repeated measures ANOVA. A regression analysis was used to examine the relationship between affect and performance. RESULTS: A strong negative correlation existed between the pleasure-displeasure dimension and performance, $r = -0.483$, $p=0.005$, as well as the pleasure-displeasure dimension and the arousal-sleepiness dimension of the affect grid, $r = -0.380$, $p=0.027$. Training resulted in a reduction of both dimensions of affect by the midpoint of the training period. Pleasure-displeasure decreased by approximately 16% ($p<0.001$) and arousal-sleepiness decreased by approximately 7% ($p=0.091$). A full recovery of these measures was observed by the end of the training period. When these changes were considered with respect to performance, only the change in pleasure-displeasure accounted for 23.3% ($p=0.011$) of the variance in performance. CONCLUSION: The affect grid provides a useful and efficient method for monitoring the psychological state of an athlete during a period of over-training. However, with affective changes accounting for only 23 percent of the variance in performance clearly other factors are influencing performance during this period, including physiological and biomechanical manifestations of over-training.

43. *A Preliminary Analysis of the Upstream Regulatory Region of the Drosophila melanogaster Enhancer of split gene mbeta.*

Katy Eby, Department of Biology, Southwestern University

Mentor: Deborah Eastman, Department of Biology, Southwestern University

In *Drosophila melanogaster* the Notch pathway is best known for its roles in determining the fate of a cell. Within the Notch pathway an activated Notch intracellular protein interacts with a specific binding protein, Suppressor of Hairless, which is located in the nucleus. This complex is responsible for upregulating the Enhancer of split (E(spl) genes. mbeta is one of seven Enhancer of split genes, and is believed to influence the production of wing veins. Evidence for this comes from the definite difference in expression pattern in the wing disc between mbeta0.4 and mbeta0.18. mbeta0.4 and mbeta0.18 refer to two constructs of the E(spl) mbeta gene that have different number of nucleotides in the promoter region upstream of the TATAA box. There is a 220 bp deletion from mbeta0.4 to make the mbeta0.18 vector.

Using two different approaches, I attempted to rescue expression of the wing veins that are present in mbeta0.4 but absent in mbeta0.18. There exists a common sequence between *Drosophila melanogaster* and *Drosophila hydei*, within the 220 bp that are the difference between mbeta0.4 and mbeta0.18, that I am testing for its likely role in the wing vein expression pattern. The common sequence was isolated and purified, as was the lacZ reporter vector into which the common sequence will be cloned. In the future I aim to clone the common sequence so that I may transform the vector construct into flies and analyze their wings discs for the predicted rescue of expression pattern resulting from the mbeta0.4 gene.

44. *Proprioceptive Training Effects on Postural Sway.*

Jason Mitchell, Department of Kinesiology, Southwestern University

Mentor: Scott P. McLean, Department of Kinesiology, Southwestern University

Many rehabilitation protocols include exercises to improve proprioception because a higher integrity of proprioception has been associated with a decreased risk of injury. Postural sway, as measured by the migration of the center of pressure during a balance test, has been used as a measure of proprioception. PURPOSE: To examine the effects of proprioceptive training on postural sway during a single leg balance test. METHODS: Fourteen healthy subjects (age=20.6±1.3 yrs., mass=78.1±22.3 kg, height=169.3±8.3 cm) without lower extremity injury performed a 10-second balance test standing on their dominant leg prior to and upon completion of a four-week training period. Subjects were randomly assigned to a control, moderate intensity (one training rotation per session) or high intensity four training rotations per session) training group. Each training rotation consisted of a six-minute exercise using a series of five proprioceptive blocks. Three training sessions were completed per week for four-weeks. A 3x2 mixed model ANOVA was used to evaluate the differences in postural sway between groups and between pre and post training balance tests. RESULTS: Mediolateral (ML), Anterolateral (AL), and Total Sway was not significantly different ($p>0.05$) between groups and between pre and post training evaluations.

The mean pre-post differences for the control and moderate intensity training groups were characterized by small effect sizes for all three measures of sway ($ES<0.22$). Post-training sway values were smaller than pre-training sway values for the high intensity training groups. For this group AP sway was reduced by 13.4 percent.

This difference was characterized by a moderate effect size ($ES=0.51$). ML and Total sway were reduced by 23.5 percent and 18.2 percent, respectively. These differences were characterized by large effect sizes ($ES = 1.16$ and 0.92 , respectively). CONCLUSION: These data suggest that there was a noticeable improvement in postural sway associated with the high intensity training.

45. *Proteomic Analysis of Eosinophil Whole Cell and Granules.*

Christof Straub, Department of Chemistry and Department of Business and Economics, Southwestern University

Mentor: Alexander Kurosky, Department of Biochemistry, University of Texas Medical Branch

Proteomics is a discovery-based science approach to describe cellular protein expression more globally under a variety of conditions. This research applied proteomic studies to ultimately understand the influence of allergens, asthma, and viral infection on eosinophil function. These studies were intended to initialize characterization of the complete eosinophil proteome map for subsequent use in comparative research applications. Many proteins in eosinophils have already been characterized; however, there are still many more proteins that have yet to be systematically identified. Human blood eosinophils were isolated and proteins were extracted from whole cells and, in separate experiments, from their granules.

The proteins were solubilized under denaturing conditions and applied to isoelectric focusing. The focused protein strips were then applied to SDS-PAGE and allowed to further separate in the second dimension according to their relative size. The proteins were then fixed using a seven percent acetic acid-10 percent methanol solution, stained with Sypro Ruby, destained, and then scanned using the ProEXPRESS imager prior to image analysis using Nonlinear Progenesis Discovery Informatics software. Protein spots were selected for robotic gel picking and processing, including

trypsin hydrolysis, prior to peptide mass fingerprint analysis using MALDI-TOF mass spectrometry. Typically, four replicates were used for each eosinophil preparation.

Of 146 protein spots picked, significant identification of 38 proteins (26 percent) was obtained. A number (5) of these proteins represented new discoveries for proteins indicated in the human genome database. Their identification also established their occurrence in eosinophils for the first time. These results represent an initial and partial establishment of a proteome map for eosinophils.

46. *We're Two White Women, What Do We Know?: A Resource Guide for the Advancement of Multicultural Education.*

Lisa Cook and Katie Peterson, Department of Education, Southwestern University.

Mentor: Alicia Moore, Department of Education, Southwestern University

"Women and whites predominate the teacher force: 73 percent of all public school teachers are women, and 87 percent of those teaching in public schools are white" (Cooper 129). This majority of white teachers, however, is not teaching a majority white student body population. According to demographic trends, "36 percent of school-age children are [people of color,] a figure that is expected to increase in the coming years" (Cooper 102). Research has shown that students exhibit higher achievement in academics when teaching is culturally responsive. As pre-service teachers and future multicultural educators, we recognize the need for educators to seek out experiences that will increase cultural knowledge, allowing teachers to better relate to students.

This presentation compiles resources that current and future educators can use to learn about methods of discovery of cultures other than their own. We have conducted interviews with people on the Southwestern campus, in Georgetown, in Austin and surrounding areas. We visited bookstores and libraries around the area and researched best practices in discovering information about cultures. We conducted research on the Internet to discover community groups, organizations and sites that will aid educators in learning about the cultures represented in their classrooms. Finally we attended events in and around the Georgetown/Austin area to learn about the many cultures that make up our community. The information that we gathered from all of these sources was summarized and compiled in booklet form. This booklet includes pictures taken at various events, addresses and names of informative contacts, and a section on implementation in the classroom.

This research will provide educators with a starting off point from which to embark on their own journey of understanding various cultures, making the task less daunting. It should also leave readers feeling empowered and confident about their abilities to learn about cultures and how to implement their new knowledge in the classroom.

47. *Regulatory Policy Making, Judicial Activism and the New Wave of Political Battles over the American Environment.*

Charles Stern, Department of Political Science, Southwestern University

Mentors: Timothy O'Neill, Department of Political Science, Southwestern University

Since the late 19th century, water resource law in the arid, Western half of the U.S. has gone

unchanged for the most part, usually backing up the extractive, human centered resource management techniques for property such as prior appropriation and irrigated agriculture that were initiated during the early settlement of the frontier. The role of the federal government has supported this status quo for the better part of the 20th century, as well, by setting up such government programs as the Reclamation Act in the early 1900s. However, since its arrival on the national political scene in the 60s, the environmental movement has presented a political challenge to the way resources are viewed and utilized throughout the country. Based on the development of traditional resource values in the West, combined with the rise of environmentalism, the political outcome for the region were acts of government which were popular at the time, but have since been severely criticized by many. Prime examples of these are the Endangered Species Act and the Clean Water Act, two policies initiated at the height of the environmental movement in the early 70s. The past of these policies, along with modern case studies in the Klamath Basin (Endangered Species Act) and the Florida Everglades (Clean Water Act), suggests that major changes in either policy are currently most likely to occur either out of executive alterations to regulatory policy based on subjective scientific reports in sensitive environmental/political areas, or out of activist court decisions in the judicial branch of government. These two distinct avenues for political change are the most likely areas of contention in the near future as all sides continue their efforts to either transform or maintain the political and ecological norms of the West.

48. *Effects of sex ratio and female mate history on copulation duration, wing beats, and mate guarding in *Xanthopimpla stemmator*.*

Jamie L. King, Department of Biology, Southwestern University

Mentor: Stephanie Fabritius, Department of Biology and Office of the Provost, Southwestern University

The study investigated the effects of sex ratio and female mate history on copulation duration, wing beats, and mate guarding in *Xanthopimpla stemmator*, a solitary endoparasitoid. The study included cataloguing the reproductive behavior of males before, during, and after copulation using different sex ratio treatments (1:5, 3:3, 5:1). The investigation also included comparing male reproductive behavior when mating with a virgin female versus a once mated female. Males had a longer copulation duration and had a larger number of wing beats when the sex ratio was heavily male biased. Males also participated in post-copulatory mate guarding when male density was higher. When virgin males were mated with virgin females and once mated females, copulation duration was longer and number of wing beats larger when mating with virgin females.

49. *Female Empowerment in Restoration Theatre "Playhouse Creatures" Costume Designs.*

Christopher Ray Stout, Department of Theatre, Southwestern University

Mentor: Kerry Bechtel, Department of Theatre, Southwestern University

The opportunity to design the costumes for Southwestern University Theatre Department's production of April de Angelis' "Playhouse Creatures" was an incredibly rewarding experience. In a play centered around the first actresses of the Restoration theatrical stage, costumes most certainly play an

integral part, both in re-creating the historical period and assisting the actors in the movements and behaviors of the time. The ultimate goal for the design was simplicity as the number of costumes and changes required is immense. With the aid of the extraordinarily talented S.U. Theatre Professor, Kerry Bechtel, I developed a concept for the designs that would essentially highlight the play's themes of female empowerment and destruction during the Restoration. From there the focus was on practicality, dressing all the women in the essential garments of the time, i.e., petticoats, bodices, overskirts. The most exciting part of the design then became finding ways in which to distinguish each of the actresses through varying bodice styles and distinct colors and fabrics, helping to define each character's individuality and personality through costumes. Overall, I found the entire process challenging to me as a student and an artist and am deeply grateful for the chance to develop my skills as a costume designer.

50. *Bridging the Gap between Theory and Practice: Let's get R.E.A.D.Y.*

Aurora Low, Denver Chandler, Joshua Keltner, Department of Education, Southwestern University
Mentor: La Vonne Neal, Department of Education, Southwestern University

Currently there is a paucity of culturally responsive and interdisciplinary curriculum material available for teachers to utilize in their classrooms. Although educational theories concerning thematic units and multicultural education have been researched and proven successful, the wide practice of these theories is yet to be seen (Geneva Gay, 1995). Therefore, academic achievement of students from a wide range of cultural backgrounds is still low, which is reflected in the results of the Texas Assessment of Knowledge and Skills (TAKS) test (National Assessment of State's Progress, 2000).

This poster session will highlight the results of a research study that explored how to design culturally responsive lesson plans and resources. Commonly, teachers are forced to search out materials in a variety of stores and Internet shops to design culturally responsive lessons. The recognition of necessity was the impetus for the design of the R.E.A.D.Y. Kit (Resources for Educators, easily Accessible for Developing Young minds); a practical resource that incorporates culturally responsive materials into a traditional curriculum. The R.E.A.D.Y. Kit was designed and field-tested in urban schools to explore how teachers can close the gap between theory and practice in order to benefit all students.

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