

# 2005

Members of the Southwestern and Georgetown Community

It is our great pleasure to welcome you to the sixth annual Southwestern University Undergraduate Research and Creative Works Symposium (SUURCWS).

For the past six years, the symposium has become one of Southwestern's greatest legacies. Its grand display of the various interests, expertise, and in and out-of-classroom experiences of Southwestern students encapsulates the spirit of a liberal arts education. The symposium is a celebration of student's ability to utilize classroom knowledge to gain understanding of the world and affect change in Southwestern, the community, and the world at large.

This year, a record high number of 63 presentations will be showcased featuring the works of 90 students from 19 disciplines. The diversity of the presentations will hopefully provide an opportunity for the Southwestern and Georgetown community to engage in conversations on thought-provoking topics.

We appreciate your attendance immensely and hope that you leave the symposium with a wealth of new knowledge. We'd like to offer our special thanks to Nikki Polnick and Kristen Meerbrey for their help with the organization of this year's SUURCWS.

Sincerely,

Erin Crockett and Josephine Thinwa  
Program Chairs, Undergraduate Research and Creative Works Symposium

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## 2005 SYMPOSIUM PROGRAM CHAIRS

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## 2005 PROGRAM AGENDA

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### ORAL PRESENTATIONS

#### Session I: McCombs Center, Connie McNab Room

- 5:00 p.m.     **1. The Spaces Between**  
Jessica Monroe, Department of Art, Southwestern University
- 5:20 p.m.     **2. The Tony Kushner Project: Theatre Artistry and Activism**  
Clair H. Baker, Department of Theatre, Southwestern University
- 5:40 p.m.     **3. Factors Influencing Religious Donations**  
Lindsey Chapman, Jenna Oglesby, Aubri Paxson, Claire Robinette,  
Department of Psychology, Southwestern University
- 6:00 p.m.     **4. National Minority Faculty Identification Program Website and Database Development**  
Matthew Gates, Kelson Gist, Lawrence Koenig, Stuart Nelson, Jeremy Russell, and Brooks Wilson, Department of Mathematics and Computer Science, Southwestern University

#### Session II: McCombs Center, Marsha Shields Room

- 5:00 p.m.     **5. Fitting Points to 2-D Supershapes**  
Kelson Gist, Department of Mathematics and Computer Science, Southwestern University
- 5:20 p.m.     **6. Designing a profitable website, the development of gtownrealty.com**  
Christopher Laubach, Mathew Baumgartner, David Shilkun, Department of Math and Computer Science, Southwestern University
- 5:40 p.m.     **7. ¿Que es esta joteria?: Sexuality and Ethnicity Among Latino/a Queers**  
Robyn Bridges, Department of Anthropology, Southwestern University
- 6:00 p.m.     **8. Religious Youth Groups and College Freedoms at Southwestern University**  
Paul MacCammond, Department of Anthropology, Southwestern University

**Session III:** McCombs Center, Lynda McCombs Room

- 5:00 p.m.      **9. Bridging the Colonial State: Power, Authority, and the Construction of Masculinities through the Indigenous Legal System; French Soudan 1939-1941**  
Courtland P. Quinn, Department of History, Southwestern University
- 5:20 p.m.      **10. Targeting of the UmuC protein for destruction by the Lon protease**  
Josephine Thinwa, Department of Biology, Southwestern University
- 5:40 p.m.      **11. Effects of DNA-reactive  $\alpha$ -OH Tamoxifen on endometrial cell lines**  
Carolina Boet, Department of Biology, Southwestern University
- 6:00 p.m.      **12. The Detrimental Effects of Economic and Educational Unbalance: Kenya in search of Equilibrium**  
Ansa Copeland, Department of Education and Department of Philosophy  
Southwestern University

**POSTER AND CREATIVE WORKS SESSION**

Welcome: President Jake B. Schrum

Location: Charles & Elizabeth Prothro Bishops Memorial Lounge, McCombs Center

6:15 - 7:05 p.m.

Refreshments served.

**ORAL PRESENTATIONS**

**Session IV:** McCombs Center, Connie McNab Room

- 7:05 p.m.      **13. Regulation of SOS Mutagenesis: In Vivo Degradation of UmuD by ClpXP in Esherichia coli**  
Jason Matthews, Department of Biology, Southwestern University
- 7:25 p.m.      **14. Shakespeare in Japan: A Part of Japanese Culture?**  
Natalie Goodnow, Department of Theatre, Southwestern University
- 7:45 p.m.      **15. Indigenous South African Healing Practices and their Effect on TB and HIV/TB patients' Utilization and Compliance with Anti-TB Medication**  
Josephine Thinwa, SIT Study Abroad South Africa: Public Health

8:05 p.m.     **16. Cartoneros and Legislators: Visions of Urban Waste in Buenos Aires**  
Christina Yagjian, Department of International Studies, Southwestern University

8:25 p.m.     **17. The Revolution in Vietnam**  
Christopher Molloy, Department of History, Southwestern University

8:45 p.m.     **18. Winds of Change: The Development and Future of Wind Energy in Germany and Texas**  
Greg Mast, Department of Modern Languages & Literatures and Environmental Studies, Southwestern University

**Session V:** McCombs Center, Marsha Shields Room

7:05 p.m.     **19. Moderate Doses of Caffeine Alter Sexual Motivation in Female Rats**  
Anastasia Benson, Department of Psychology, Southwestern University

7:25 p.m.     **20. The Role of the CS in Determining the Nature of the CR in Cuttlefish (*Sepia officinalis*)**  
Anne Peters, Elizabeth Riedlinger, Department of Psychology, Southwestern University

7:45 p.m.     **21. What Mama Taught Me: Exploring Cultural Values Taught by Black Mothers and How Those Values Affect Their Daughter's Interpretations of Mother/Daughter Relationships Presented in the Media**  
Terrene Knight, LaToya Alexander, Leigh-anna Price, Kendal George, Department of Education, Southwestern University

8:05 p.m.     **22. A Case Study of a Fifth-grade Math and Science Teacher's Daily Teaching Decisions**  
Grant Kessler, Department of Education, Southwestern University

8:25 p.m.     **23. The Effects of Cultural Diversity on International Business**  
Darshna Patel, Department of Economics and Business, Southwestern University

8:45 p.m.     **24. Life Backstage: The Culture of Live Music Production**  
Nathan Turner, Department of Anthropology, Southwestern University

9:05 p.m.     **32. The Elderly Needs Assessment**  
Stefanie Foster and Jackie Diaz, Department of Psychology, Southwestern University

**Session VI:** McCombs Center, Lynda McCombs Room

- 7:05 p.m.     **25. Carnival: From Opposition to Reinforcing the Dominant**  
Cassie Whitaker, Department of Anthropology, Southwestern University
- 7:25 p.m.     **26. Greener Pastures: The Role of Organic Foods and Farmer's Markets in the Austin Area**  
Katherine Wright, Department of Anthropology, Southwestern University
- 7:45 p.m.     **27. Analysis of Handedness and Laterality Through Observation of Bipedal Feeding in Captive Chimpanzees**  
Blair Quinius, Department of Animal Behavior, Southwestern University
- 8:05 p.m.     **28. Invaders from the South: Applesnail Ecology and Life History**  
Rebecca Marfurt, Department of Biology, Southwestern University
- 8:25 p.m.     **29. Induction of SOS Mutagenesis under Starvation Conditions**  
Bhavik Kumar, Department of Biology, Southwestern University
- 8:45 p.m.     **30. A Feminist Critique of Joseph Heller's *Catch-22***  
Chelsey Clammer, Department of Feminist Studies and Department of English, Southwestern University
- 9:05 p.m.     **31. Beyond Medea? The Struggle to Think Genealogically**  
Marie Draz, Department of Theatre, Southwestern University

## ABSTRACTS: ORAL PRESENTATIONS

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1. *The Spaces Between*

Jessica Monroe, Department of Art, Southwestern University

Mentors: Mary Hale Visser, Department of Art, Southwestern

University, and Victoria Star Varner, Department of Art, Southwestern University

I find value in working with thematic repetitions. The mask sculptural series began first as a metaphor for the filters, or social constructions through which we view the world. As the sculptural mask series progressed, I felt the need to show how a singular object changes through that filter, and the "Squares Of Flesh" painting series resulted. Each individual painting in the series is meant to show how one 2-inch square on the knee of a model might be seen from various cultural perspectives.

The series as a whole approaches an expression of the collective viewpoint. The painted squares in the series are presented in a grid on the wall. Through the process and presentation I am able to say more in the spaces between individual pieces than I could in any one work alone. By demonstrating subtle differentiations amidst a kaleidoscope of perspectives, I can better emphasize the interaction between the pieces that in turn form the collective. The art does not reside specifically in the paintings or the masks, but the collective reception of a singular thing shown in multiple and simultaneous ways. The use of grids and color fields by mid-20th century artists influence my work, but I subscribe to a more contemporary mode that allows me to explore beauty through an analysis of the mundane. I have studied the contemporary redefinition of abstraction.

Critiques of exhibitions such as "Abstract Painting Once Removed" at the Contemporary Museum of Art in Houston, and "Negotiating Small Truths" at the Blanton Museum of Art in Austin, Texas, describe contemporary works—the distant offspring of the Modernist Abstractionists—that disregards a previous theoretical system to create provocative and socially pertinent works of art.

2. *The Tony Kushner Project: Theatre Artistry and Activism*

Clair H. Baker, Department of Theatre, Southwestern University

Mentors: Sergio Costola and Kathleen Juhl, Department of Theatre, Southwestern University

A presentation to evaluate the works of Tony Kushner and their effects within the realm of social change. Can theatrical work be perceived as more than just theatre artistry? Can theatre move society far enough to make social change? Is the theatre merely a place for entertainment, or can it drive political and social reforms? These are many questions that Tony Kushner asks himself and his audiences. *The Tony Kushner Project: Imagining the Unimaginable* was meant to act as political theatre, a type of guerilla theatre on Southwestern campus. Pedagogical collaboration within the department explored these ideas very thoroughly. Pedagogy represents an avenue in which these ideas can be further expressed and explored. Tony Kushner says that this kind of

collaboration can exist, “I believe that everybody in a room together having the same experience creates something; it creates an energy; it creates a community; it creates a phenomenon that didn’t exist before and that in almost a mystical way creates good in the world, and it also empowers.” By collaborating with one another and utilizing theatre as an interdisciplinary outreach, this kind of guerilla political theatre can create and motivate social change.

3. *Factors Influencing Religious Donations*

Lindsey Chapman, Jenna Oglesby, Aubri Paxson, Claire Robinette, Department of Psychology, Southwestern University

Mentor: Richard Osbaldiston, Department of Psychology, Southwestern University

Recent research has shown that many factors contribute to a congregation’s motivation for giving to the church (Hoge et al., 1996). The purpose of the current study was to assess the factors that influence monetary donations to a local church by using a questionnaire that addressed church members’ current financial situations and their attitudes and feelings toward their church. As such, questionnaires were mailed to every member of the congregation and 419 members completed and returned the questionnaire to church officials. In this quasi-experiment, it was predicted that there would be a positive relationship between the participants’ sense of belonging, the total amount they pledged, and the actual amount they gave. It was also hypothesized that the participants’ length of membership, level of participation in ministries, involvement in programs and events, and level of knowledge about the major church projects would influence the amount of giving. The project is currently in the data entry stage, but analyses testing the stated hypotheses will be presented.

4. *National Minority Faculty Identification Program Website and Database Development*

Matthew Gates, Kelson Gist, Lawrence Koenig, Stuart Nelson, Jeremy Russell, and Brooks Wilson, Department of Mathematics and Computer Science, Southwestern University

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

The National Minority Faculty Identification Program (NMFIP) connects minority faculty members with participating institutions in order to find teaching positions for the faculty candidates. A current system exists for NMFIP at the website: <http://www.southwestern.edu/natfacid.html>. The current system has been in place for nearly a decade and must be updated to include new functionality and improve usability for the administrator, as well as for faculty candidates and participating institutions.

This software engineering project has proceeded as a modified agile development process, which began with the development of a prototype for the new website. Following the completion and revision of the prototype, two design documents were developed specifying the architecture of the resultant system. The Software Requirements Specifications design document described the client requirements for the NMFIP system. The Software Design Specification document provided the technical

documentation for the implementation of the software. The architecture of the system included a database for storage of the candidate records, institutions, and available jobs for candidate members. The database was implemented in MySQL, an open-source relational database system. The database was accessed through a web-server programmed with Hypertext Preprocessor (PHP). The new database system allowed for records that could be edited by the candidates, institutions, and the administrator. The administrator is no longer required to edit candidate and institution information manually. The software also allowed institutions to post jobs directly to the NMFIP system. Following successful implementation of the NMFIP software, testing and verification were employed to ensure the level of quality of the software. The software is scheduled to be deployed in the fall of 2005. The software project improved the effectiveness and impact of the NMFIP and the maintainability of the website for long-term use.

5. *Fitting Points to 2-D Supershapes*

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

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

The Superformula, a mathematical formula that describes shape, was developed by Johan Gielis and explored in his book, *Inventing the Circle: The Geometry of Nature* (2003). The Superformula is an extension of the superellipse that allows for change in the rotational symmetry as well as greater variation of the convexity/concavity of the shape. The focus of this research has been the development of an algorithm that produces the best fit of the parameters of the Superformula, as well as the position and orientation, from a set of points. The research has been restricted to 2-D points produced by the Superformula in the presence of noise.

The Hough Transform for lines is used to estimate the rotational center and axes of symmetry of the figure. In order to determine the axes of symmetry, the set of midpoints for all of the points in the data set is calculated. The Hough Transform is used to find the axes of symmetry by finding clusters in transform space corresponding to lines formed by the midpoints of points reflected across an axis of symmetry. The rotational center of the figure can be calculated as the intersection of the axes of symmetry. Since every supershape is symmetric about the x-axis, the orientation can be determined. Furthermore, the number of axes of symmetry is directly related to the value of one of the parameters of the Superformula. During optimization, values of this parameter are limited to multiples of the number of axes of symmetry. Using the orientation and the possible levels of symmetry for the figure, optimization is then implemented to determine the best fit of the remaining parameters of the supershape to the set of points. The optimization process utilizes nonlinear least squares fitting procedure with the remaining parameters and the constrained parameter for symmetry.

6. *Designing a Profitable Website, the Development of gtownrealty.com*  
Christopher Laubach, Mathew Baumgartner, David Shilkun, Department of Mathematics and Computer Science, Southwestern University  
Mentor: Barbara Boucher Owens, Department of Mathematics and Computer Sciences, Southwestern University

Our project follows each developmental step of the creative process of taking a low-end commercial website with negligible visibility (gtownrealty.com) and implementing user-oriented initiatives to improve accessibility, usability, and visibility of the website's primary functionality. Transforming a rather dry and unappealing website into a commercial venue that services many clients with first-time and continuous usage options.

Using research, the website will be designed so as to maximize its visibility on world-wide-web based search engines. The website will also use sociological studies to determine the best artistic scheme to use for a commercial website to cultivate and encourage first-time and repeat customers to find the website both aesthetically pleasing and useful.

A SQL database will be used to track user information allowing the company to organize its respective buyers and sellers of real estate to automate systems such as the company's electronic mail newsletter. The explanation of the final product will draw heavily from the Software Design Specification Document as well as personal accounts of the developmental process.

7. *¿Que es esta joteria?: Sexuality and Ethnicity Among Latino/a Queers*  
Robyn Bridges, Department of Sociology and Anthropology, Southwestern University  
Mentor: Melissa Johnson, Department of Sociology and Anthropology, Southwestern University

"ALLGO" is a Latino/a G,L,B,T,Q organization that I submerged myself into in hopes of obtaining a greater understanding of the ways in which sexual and cultural identities are interrelated, thus gaining greater insight on what it means to be both Latino/a and queer. In other words, as I participated in this specific organization throughout the semester I developed some perspective about how one who is both Latino/a and queer negotiates oneself in larger society. This project predominately took place on the grounds of the "ALLGO" organization and acutely focuses in on a smaller group within the organization titled "Entre Ellas" or Between Women.

The majority of my research entailed attending meetings as a regular participant of the group, as well as attending various functions that arose within the semester. Moreover, there were several opportunities to simply chat and mingle with informants and their friends, and I pursued these because I feel that a good way to capture people's true essences is outside of the interview and other formalized spheres. A portion of my research also entailed one on one interviews that predominately focused on the coming out stories of my informants, as well as brief Q and A sessions. I utilized the interviews to gather the various ways in which my informants identify sexually and ethnically. Moreover, because I am not the first to conduct this sort of research, I also carried out

some in-depth research to both create and expand on past anthropologists' and feminist scholars' works on the issues of sexuality and race. In summation, I not only understand better the ways in which the women of "Entre Ellas" and the members of the "ALLGO" organization formulate their identities, but I have also attempted to communicate their identity through this paper and presentation as part of my ethnographic methods class.

8. *Religious Youth Groups and College Freedoms at Southwestern University*  
Paul MacCammond, Department of Sociology and Anthropology, Southwestern University  
Mentor: Melissa Johnson, Department of Sociology and Anthropology, Southwestern University

The presentation will be based on an ethnographic research project that examines the ways in which college freedoms have affected former religious youth group participants on the Southwestern University Campus. Participants are grouped into three categories. 1) Those who continue to actively participate in religious groups after attending Southwestern University; 2) Those who actively participated in religious youth groups before attending Southwestern University and who stopped afterwards; and 3) Those who did not participate in religious youth groups before attending Southwestern University, but who do so now. This research will analyze a critical part of the Southwestern community that involves a significant number of people. Furthermore it will begin to shed light on much bigger cultural aspects of the religious life of college students.

9. *Bridging the Colonial State: Power, Authority, and the Construction of Masculinities through the Indigenous Legal System; French Soudan 1939-1941*  
Courtland P. Quinn, Department of History, Southwestern University  
Mentor: Thomas McClendon, Department of History, Southwestern University.

This presentation is drawn from research conducted over the past year and a half both in the United States and Mali and is the foundation of my Honors Thesis for the Department of History. The project employs insight gained from contemporary Africanist historiography into the importance and uniqueness of colonial legal systems in combination with emerging theoretical assertions on masculinities in gender analysis. Also, the project explores tensions and relationships of power, authority, and ideology in the mid-to-late colonial period of French West Africa. The research centers on a particularly dramatic and valuable legal dispute between Sine Demebele, 'Chef du Village de Kalla' vs. Lassenou Djire of Segou that began in 1939 in the French Soudan (colonial Mali) and continues today. Through this research I hope to engage in, network, and advance scholarly conversations on colonial law and masculinities, while illuminating the nature and intricacies of the colonial experience—an experience that I believe continues to shape global social experience in the most profound ways.

10. *Targeting of the UmuC protein for destruction by the Lon protease*  
Josephine Thinwa, Department of Biology, Southwestern University  
Mentor: Martín Gonzalez, Department of Biology, Southwestern University

In the event of severe DNA damage, *Escherichia coli* turns on a survival mechanism which allows for DNA synthesis across what are normally synthesis-inhibiting DNA lesions. This mechanism is known as SOS mutagenesis. The error-prone DNA polymerase V is the key protein in SOS mutagenesis and is composed of two polypeptides, UmuD' and UmuC. However, since replication during "SOS response" is error-prone, the regulation of the Umu proteins is crucial to assure that DNA polymerase V is active only when it is needed. UmuC has been found to be highly susceptible to degradation by the Lon protease. In this study we show using western blot analysis, that the 67 amino acids carboxy-terminal of UmuC targets UmuC protein for Lon-mediated degradation. Furthermore, our studies suggest that a second protease may be involved in regulating the levels of UmuC.

11. *Effects of DNA-reactive  $\alpha$ -OH Tamoxifen on endometrial cell lines*  
Carolina Boet, Department of Biology, Southwestern University  
Mentor: Maria Cuevas, Department of Biology, Southwestern University

Tamoxifen, a selective estrogen receptor modulator (SERM), is the most widely used drug for breast cancer treatment and prevention. In breast tissue, tamoxifen functions as an antagonist, whereas, in the uterus it has agonistic properties. Besides binding to the estrogen receptor (ER), tamoxifen has also been shown to form DNA-adducts. The objective of the present study is to investigate the genotoxic effects of tamoxifen and its metabolites, specifically  $\alpha$ -OH Tamoxifen (a non commercially available compound) due to DNA-adduct formation. Using human endometrial cell lines HEC 1A (ER positive) and HEC 1B (ER negative), distinction between tamoxifen DNA-adduct vs. ER regulation of gene expression will be possible. These cell lines will be treated with estrogen and four different SERM's. Potential target genes will be examined by Northern blot, real time PCR and microarray, and protein expression will be examined by Western blot. In addition, the presence and localization of drug-DNA adducts will be determined by using ligation mediated PCR. The identification of genes regulated by drug DNA-adduct formation and its location will establish the potential genotoxicity of this drug and provide alternate explanation for tamoxifen molecular mechanism.

12. *The Detrimental Effects of Economic and Educational Unbalance: Kenya in Search of Equilibrium*  
Ansa Copeland, Department of Education and Department of Philosophy, Southwestern University  
Mentor: Alicia Moore, Department of Education, Southwestern University

In the mid 1800's, missionaries laid the foundation for formal education in Kenya and by 1910, 35 mission schools had been founded. These schools, however, were segregated and three separate and unequal education systems were formed for Europeans,

Asians, and Africans. The separate education systems were most blatantly unequal in their per pupil expenditures, which were more than five times higher for Europeans than for Africans (Alwy and Schech, 2004). When Kenya gained its independence in 1963, the government began attempts to alleviate the problems that plagued the education system in terms of both real expenditure, and the percentage of government spending allocated to education. Yet the Kenya Country Report (Government of Kenya, 1995) and the Education for All (EFA) Assessment Report (UNESCO, 2000) presented findings that showed the government's attempts to regulate the education system became, and continue to be, a source of economic struggle and turmoil (Alwy and Schech, 2004). Additionally, previous research conducted by educationalists and economists in Kenya have found that due to the radical inequalities, the university graduates outnumber the jobs available. Meanwhile the economy continues to suffer as families fall into debt in order to pay for the ever-increasing expenses of higher education.

This study is an attempt to search for practical solutions that will counter the continued economic and educational struggles by encouraging education and career development (i.e., trade schools and self employment) Furthermore, this study examines the ramifications of foreign financial aid to fund such endeavors, as well as developing a program designed to increase job provision and employment rates. The researchers will collect, analyze, interpret and synthesize the data collected from Kenyan educationalists and economists. The following research questions are being addressed: (a) What are the current economic trends? (b) What is the economic/education relationship in various regions (rural vs. urban)? (Alwy A Schech S. (2004) Ethnic Inequalities in Education in Kenya. *International Education Journal* Vol. 5.2)

13. *Regulation of SOS Mutagenesis: In Vivo Degradation of UmuD by ClpXP in Escherichia coli*

Jason Matthews, Department of Biology, Southwestern University

Mentor: Martín Gonzalez, Department of Biology, Southwestern University

The UmuD protein is a key component in the formation of the error-prone DNA polymerase pol V. Since the action of pol V is highly mutagenic, the proteins that interact to form pol V, including their precursors such as UmuD, must be closely regulated. Regulation of UmuD by ClpXP has been in question in vitro, and its effects in vivo have not been well studied. Here, we hoped to determine if the potential in vitro role of ClpXP on the degradation of UmuD holds true under physiological conditions. In this study, we found that ClpXP plays a secondary role in the degradation of the UmuD homodimer. Additionally, the terminal location of the recognition signal for ClpXP and Lon is independent to the degradative abilities of the proteases on UmuD.

14. *Shakespeare in Japan: A Part of Japanese Culture?*

Natalie Goodnow, Department of Theatre, Southwestern University  
Mentor: Sergio Costola, Department of Theatre, Southwestern University

Theatrical productions of Shakespeare have become a sort of cultural phenomenon in Japan. Now, over 100 years after Shakespeare's introduction to Japan, there are anywhere from 50 to 100 productions of Shakespeare in Tokyo alone each year.

At first glance, this would seem to be a triumph of intercultural theatre. However, is this exchange still intercultural? In an interview, Kawamura Takeshi, one of Japan's latest generation of theatre practitioners stated, "I think Shakespeare's texts have actually become part of Japanese culture. Performing Shakespeare is a natural thing for us. It's not like a text from a different culture that we don't understand." What factors contribute to this ready assimilation of Shakespeare into Japanese society?

In this investigation, I put forth two alternate hypotheses: first that this assimilation of Shakespeare into Japanese culture is due to the similarities that already existed between Japanese theatrical forms, particularly Kabuki, and the Shakespearean theatre; and second that Shakespeare's assimilation into Japan is due to a conscious effort on the part of the Japanese to make his texts their own through a willingness to adapt them to their own ends. I evaluate these hypotheses through analysis and comparison of discussions on Shakespeare in Japan from theatre critics, theorists, and practitioners specializing in the fields of Shakespearean theatre, Japanese theatre, or both.

15. *Indigenous South African Healing Practices and their Effect on TB and HIV/TB patients' Utilization and Compliance with Anti-TB Medication*

Josephine Thinwa, SIT Study Abroad South Africa: Public Health  
Mentors: Mthombeli Guma SIT Study Abroad South Africa: Public Health,  
University of Port Elizabeth and Dubase Zoliswa, Coordinator of Continuous  
Professional Development and In-service Training in Nelson Mandela Bay  
Metropolitan

A sample of tuberculosis patients attending New Brighton Clinic in a small South African urban community were surveyed and interviewed on their use of alternative treatments and interpretation of TB. This study specifically focused on TB patients' use of traditional medicine in treating TB and whether this use had an effect on the patients' willingness to utilize and adhere to anti-TB treatment from the clinic. Investigations were also done to characterize if an HIV positive status influenced TB patients' inclination to utilize traditional medicine. The data gathered from the questionnaire and interviews indicated that 70% of patients had accessed alternative treatments meant to treat tuberculosis but not issued by the clinic. Traditional herbal remedies or practices were found to be prevalent amongst 59% of the patients sampled. Interestingly, patients who utilized alternative medicine during the clinic's TB drug regimen missed on average six more days of clinic treatments than patients who refrained from using alternative treatments. Furthermore, about one third of the patients sampled tried

utilizing traditional treatments, including consulting traditional healers, to cure TB symptoms before going to the clinic. These patients waited for an average of 20 more days before accessing the clinic for treatment, than patients who chose not to use any sort of alternative medicine to treat TB symptoms. HIV status was found to have no significant influence on patients' utilization of alternative treatments. Overall conclusions were drawn that the general public would benefit from receiving more education on identification of TB symptoms, cause, and treatment so access of treatments would be more expedient. Also, cooperation between the biomedical and traditional practitioners was found to be necessary in order to encourage patients to use and adhere to the biomedical TB treatment.

16. *Cartoneros and Legislators: Visions of Urban Waste in Buenos Aires*  
Christina Yagjian, Department of International Studies, Southwestern University  
Mentors: Brenda Pereyra, Director of The School for International Training,  
Southern Cone and Pablo Schamber, Professor at Universidad de Lanús, Buenos  
Aires, Argentina

On December 20 of 2001, the worst economic crash in the history of the country fell upon Argentina. As a result of the unemployment caused by the crisis and a rise in the price of recyclables, what seemed to be a new population of workers appeared on the streets of Buenos Aires almost over night. Their work involved looking through the garbage for recyclable or things that could be resold and because they are almost always seen carrying and collecting cardboard, "carton" in Spanish, they have become popularly known as the "cartoneros." This paper looks at the ideas of the city legislator and the cartoneros themselves regarding this new form of work, its conditions, and its future.

17. *The Revolution in Vietnam*  
Christopher Molloy, Department of History, Southwestern University  
Mentor: Daniel Castro, Department of History, Southwestern University

Throughout their history, the Vietnamese have been involved in a series of conflicts with different colonial powers, including a period of French domination. During the period that encompasses the late-19th to mid-20th centuries, the Vietnamese were involved in a bloody process, which can be characterized as an Anti-colonial revolution. The nature of this struggle can be defined through an examination of the political and social struggles taking place at the time. When these forces coalesced, the Vietnamese engaged in a bitter revolutionary process that eventually put an end to colonialist rule, and allowed them to recover their own land.

18. *Winds of Change: The Development and Future of Wind Energy in Germany and Texas*  
Greg Mast, Department of Modern Languages & Literatures and Environmental Studies,  
Southwestern University  
Mentor: Erika Berroth, Department of Modern Languages and Literatures, Southwestern  
University

The recent coming into effect of the Kyoto Protocol obligates the signatory nations to cuts in their carbon emissions. Renewable energy will play a role in these efforts, with wind energy leading the way as the most economical technology in use. In its modern sense, wind energy refers to electrical power production using wind turbines of varying size and power rating. Since initial commercial development during the 1970s, both the range and the size of such large-scale turbines, the newest of which have a rotation diameter of over 100 meters and a faceplate capacity of 4.5 MW, has risen dramatically. These turbines are widely accepted as a viable alternative to traditional fossil fuel based energy production, and its environmental consequences, but some critics claim they cause dangerous noise pollution, destroy the natural landscape, and endanger migratory birds. In spite of these and other difficulties, and largely due to the efforts of its Green Party, Germany has become the world leader in wind energy, with over a third of the entire world's total and over half of installed European capacity. In comparison, Texas accounts for half of all newly built wind energy capacity in the United States, despite the lack of a dedicated ecological party and without being obligated to any climate protection treaties. My research shows how the current state of affairs, as well as the future success of wind energy in both Germany and Texas, depends on a number of unique geographic, legislative, economic, and cultural factors all acting in relation with one another. I have examined these factors and concluded that wind energy will play an increasingly important role in the energy makeup of both regions.

19. *Moderate Doses of Caffeine Alter Sexual Motivation in Female Rats*  
Anastasia Benson, Department of Psychology, Southwestern University  
Mentor: Fay A. Guarraci, Department of Psychology, Southwestern University

The present study evaluated the effects of acute caffeine administration on paced mating behavior and partner preference in ovariectomized rats primed with estrogen and progesterone. In Experiment 1, female rats were tested for paced mating behavior following acute administration of caffeine (15 mg/kg). Caffeine shortened the latency to return to a male following an ejaculation. Although this dose of caffeine did not alter the frequency of leaving a male after receiving sexual stimulation, locomotor activity was increased significantly. Experiment 2 evaluated the dose response characteristics of acute caffeine (7.5, 15 and 30 mg/kg) administration on paced mating behavior. Consistent with Experiment 1, caffeine at the lower doses shortened the latency to return to a male following an ejaculation. Finally, to determine whether the effects of caffeine on contact return latency reflect a change in sexual motivation or merely an inability to inhibit

locomotion, female rats were tested for partner preference (sexually active male vs. estrous female) following acute caffeine administration in Experiment 3. Despite caffeine's effect on locomotor behavior, no differences in the preference for a male were observed. Collectively, these results suggest that the acute effects of caffeine on female mating behavior may reflect both an increase in sexual motivation as well as a general increase in locomotor activity.

20. *The Role of the CS in Determining the Nature of the CR in Cuttlefish (Sepia officinalis)*  
Anne Peters, Elizabeth Riedlinger, Department of Psychology, Southwestern University  
Mentor: Jesse E. Purdy, Department of Psychology, Southwestern University

Purdy, Roberts, and Garcia (1999) examined associative learning in cuttlefish (*Sepia officinalis*). For cuttlefish in the paired condition, a bright flashing light (conditioned stimulus or CS) was presented at one end of a long tank followed by the presentation of a live feeder fish (unconditioned stimulus or US) dropped into the center of the tank. For cuttlefish in the unpaired condition, food was delivered either before or after CS presentation. Paired cuttlefish oriented to the light, positioned themselves within striking distance, and occasionally attacked the light. Unpaired cuttlefish showed no reliable response to either stimulus. The results provided the first controlled demonstration of associative learning in this species. Two questions of interest arise from the Purdy, et al., study. First, why would cuttlefish strike the light at all, and second, why did they strike the light only 10% of the trials when they oriented and moved toward the stimulus at a much higher percentage? The present experiment tested the hypothesis that the CS plays a role in dictating the nature of the CR. Cuttlefish received trials in which a CS was paired with a stationary US. For one half of the cuttlefish, the CS was stationary and for the other half, the CS was moving. In both cases the CS resembled a natural prey item. It was hypothesized that the conditioned response to a stationary CS would differ from that of the moving CS. Specifically, since the moving CS showed a greater resemblance to a moving prey item (shrimp or fish) it was predicted that cuttlefish would attack by orienting, moving toward, and striking the moving CS more than it would attack the stationary CS. Two non-paired control groups were used to demonstrate that a learned association had been made. Results showed that cuttlefish in the moving paired group struck the CS more than the stationary-paired cuttlefish and that cuttlefish in the unpaired control groups did not strike the prey systematically. These data confirm that the animals were associating the moving or stationary CS with the US and responded accordingly. In addition, the results provide evidence that the CS plays a role in determining the nature of the conditioned response.

21. *What Mama Taught Me: Exploring Cultural Values Taught by Black Mothers and How Those Values Affect Their Daughter's Interpretations of Mother/Daughter Relationships Presented in the Media*

Terrenee Knight, LaToya Alexander, Leigh-anna Price, Kendal George, Department of Education, Southwestern University

Mentor: Alicia Moore, Department of Education, Southwestern University

Through informal conversations of female African American students here at Southwestern University, the powerful themes of: (1) cultural values taught to black daughters, and (2) the affects of those values on black daughters' interpretations of black mother/daughter relationships in the media have become a frequent part of the conversations. Consequently, as African American daughters ourselves, we realized explanations that accurately explain the phenomena of the black mother/daughter relationship related to these themes are limited. As a result, little is known about the black mother/daughter phenomenon from the perspective of African American daughters.

This project, titled *What Mama Taught Me*, explored the culturally constructed values that black mothers teach their daughters and how those values do in fact have an affect on their daughters' interpretations of black mother/daughter relationships in the media. This study investigated the universality of certain values and the roles they play in black daughters' interpretations of media representations. Focus groups for black mothers and black daughters were held to obtain the qualitative data needed to identify/locate themes that connected the values and the interpretations. As we gathered and analyzed the data, we began to find that themes of self-discipline, outside discipline and respect emerged as well as the value of an education. This topic was unique in that it lacked a cultural framework and had been infrequently researched.

22. *A Case Study of a Fifth-grade Math and Science Teacher's Daily Teaching Decisions*

Grant Kessler, Department of Education, Southwestern University

Mentor: Michael Kamen, Department of Education, Southwestern University

As the policy behind math and science education continues to evolve, research needs to be done to show the impact these reforms are actually having on the classroom. This is a case study of a fifth-grade math and science teacher. We examine the issues and factors that affect her pedagogical and curricula decisions. Focus is given to the role district/state standards and the TAKS tests have on the educational context of the classroom.

23. *The Effects of Cultural Diversity on International Business*

Darshna Patel, Department of Economics and Business, Southwestern University  
Mentor: Mary Grace Neville, Department of Economics and Business, Southwestern University

Culture is a resounding aspect within every person, organization, and country. It is a lifestyle, a possession, and a necessary component in determining who we are and how we conduct business. Since culture has an influence in shaping our morals, our identity, and our work values, what influence does it have on business systems in the way transactions are made and how decisions are followed through? This study illustrates how the Czech culture functions differently in business than in the United States business system even though we are one interconnected global business system.

The first phase of data research consisted of attending the 4<sup>th</sup> International Student Symposium in Prague, Czech Republic. The symposium allowed me to deepen my perceptions of the world as I worked with others to gain insight on cultural diversity in business practices. Upon returning, research implications were presented in an online worldwide conference called Business as a World Benefit. This conference mobilized millions through face-to-face interviews to tap the positive potential of appreciative inquiry. The third phase of research will focus on paradigmatic shifts needed in business for crating a more sustainable global world. The purpose of this semester-long research is to create a better understanding of and insight to others which fosters a paradigm of interconnectedness resulting in better and stronger global relationships overall.

24. *Life Backstage: The Culture of Live Music Production*

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

Live music is something frequently encountered by a majority of individuals residing in the United States. A cornerstone of the live music industry is the production company that may be called upon to provide lighting and sound equipment for live performances. As an employee of one such company in Central Texas as well as an undergraduate student of the social sciences, I will explore the world of live music production, particularly focusing upon issues of power and class within this very unique workplace.

Power relations will be explored both within the company and outside of it, where what I have called “sound man” culture is put into dialogue with the mainstream society. This will consist of the thoughts of friends and family and their thoughts in regard to the occupation and way of life as a whole. Also, I will present why many of these individuals have pursued this field rather than any others and what about this occupation interests them. The power relations portion of the project will consist of analysis in regard to how decisions are made, both in day-to-day activity within the company and at performances. This study is sure to present new knowledge and insights about a highly visible yet particularly unknown group in American society.

25. *Carnival: From Opposition to Reinforcing the Dominant*  
Cassie Whitaker, Department of Anthropology, Southwestern University  
Mentor: Melissa Johnson, Department of Sociology and Anthropology,  
Southwestern University

Through a case study of both carnival and traditional folk dances in Oruro, Bolivia, I will consider both the organization and institutionalization of Carnival and some of the specific performances of Carnival. I will also investigate other folk dances, and I will engage these debates with insights from Bolivia's celebration of Carnival. Carnival is seen as one of the most festive parts of the year around the world. Elaborate costumes are paraded, traditional and modern dances are performed, and food and drink are consumed in excess. This festival can be seen as a holiday where boundaries of class, race, and gender are transcended. I believe however, Carnival has now become a stage for the wealthy, hindering gender ideologies are perpetuated, and the dominant category of society is no longer truly challenged.

Participating in any of the numerous Carnival parades requires extensive funding that alone excludes those of the lower class regardless of dancing or musical ability. Many of the traditional costumes have been modified for a more modern appearance, which entails shorter skirts, higher heels, and more make-up for women, while men's costumes remain relatively modest. Folkloric dance and music born of slavery and resistance has now been usurped by the dominant force of society leaving the founders to observe from the bleachers unable to dance in the streets. Carnival indicates cheap alcohol specials and more "feriados" (days off of work) for those unable to actively participate in the parades and festivities. I plan to explore the changes that occurred to cause this shift from opposition toward dominant ideologies to implementing the dominant dogma. From the origin in South America through the present celebration, traditional folk dances and the festival of Carnival have drastically been altered and now possess different significance for all parties involved.

26. *Greener Pastures: The Role of Organic Foods and Farmer's Markets in the Austin Area*  
Katherine Wright, Department of Anthropology, Southwestern University  
Mentor: Melissa Johnson, Department of Sociology and Anthropology,  
Southwestern University

My presentation will be based upon a semester-long project that used participant observation and other ethnographic techniques to investigate local farmers' markets. I explore the degree to which alternative local food economies are viable in the Austin area, and analyze the ways in which community and competition are built into the market. I will examine how race, class, gender, age, nationality, and religious affiliation play into people's roles within the market and how the market fits into larger socioeconomic frameworks.

27. *Analysis of Handedness and Laterality Through Observation of Bipedal Feeding in Captive Chimpanzees*

Blair Quinius, Department of Animal Behavior, Southwestern University  
Mentor: Steven Schapiro, Department of Veterinary Sciences, The University of Texas M. D. Anderson Cancer Center, Bastrop, TX

Hemispheric specialization and laterality are areas of interest that have been studied for many years in humans, however, less is known about these topics in other species. Analysis of handedness in chimpanzees is a growing area of research, one that could provide insight into the development of the human brain.

Many tasks have analyzed handedness in chimpanzees, including studies of grooming, bimanual feeding and tool use. These studies have shown that approximately 60% of captive chimpanzees are right-hand dominant. In our study, conducted at The University of Texas M. D. Anderson Cancer Center, handedness was observed in 45 chimpanzees during a bipedal feeding task in which the animals had to reach for food items suspended from above. Our results agree with previous results that chimpanzees do show hand preferences. However, preliminary analyses of our data do not agree with previous findings; in our bipedal reaching task chimpanzees have generally shown a preference for use of the left hand.

28. *Invaders from the South: Applesnail Ecology and Life History*

Rebecca Marfurt, Department of Biology, Southwestern University  
Mentor: Romi Burks, Department of Biology, Southwestern University

Exposure to multiple vectors increases the susceptibility of aquatic ecosystems to invasion. Transferred through the aquarium trade, channeled applesnails (*Pomacea canaliculata*) may negatively impact native ecosystems through their rapid reproduction and voracious appetite for aquatic plants. Current management efforts suffer from a lack of basic data regarding abiotic and biotic impacts on applesnails. To address this, we first tested how salinity affected snail mortality. Both adults and hatchlings tolerated salinity levels as high as 8pp, higher levels quickly led to mortality. To examine salinity impacts on feeding, adult snails received lettuce and hatchlings fed on algae covering stone tiles. Adult feeding increased significantly at 8ppt compared to 0ppt ( $p = 0.002$ ), while hatchling consumption did not vary ( $p = 0.284$ ). To address biotic factors, we tested how applesnails responded behaviorally to predatory cues from fish, turtles, crayfish and adult applesnails. Our results indicated that fish and crayfish prompted similar predator-avoidance behaviors in hatchlings ( $p$ 's  $< 0.05$ ) and that hatchling response changed over time. Snails moved away from the bottom when these predators occurred. To examine the subsequent impact of predation, we allowed adult and juvenile redear sunfish (*Lepomis microlophus*) to prey on applesnails and native ramshorn snails. Consumption rates of juvenile fish did not vary ( $X^2$ ,  $p > 0.05$ ), whereas adult fish consumed more applesnails ( $X^2$ ,  $p < 0.001$ ). Our current research efforts focus on examining if predator presence or macrophyte choice alters applesnail feeding rates.

Overall, our experiments indicated that applesnails tolerate abiotic stress and respond to likely predators. Further research on applesnails can foster future management efforts.

29. *Induction of SOS Mutagenesis under Starvation Conditions*

Bhavik Kumar, Department of Biology, Southwestern University

Mentor: Martín Gonzalez, Department of Biology, Southwestern University

The *Escherichia coli* SOS response to DNA damage is controlled by two proteins, a LexA repressor and RecA\*. Following exposure to DNA damaging agents the replicative polymerase DNA pol III stalls at DNA lesions creating regions of single stranded DNA. These single stranded regions of DNA stimulate the RecA protein to undergo a change from its normal physiological state to an activated one referred to as RecA\*. One of the many functions of RecA\* is the cleavage of UmuD to UmuD' which is required for activation of the error-prone DNA polymerase V. Interestingly, DNA pol V activation is evident during nutrient deprivation in the absence of any DNA damaging agents. In this study, we evaluate the possible role of starvation-induced inorganic polyphosphate production on activation of DNA pol V. Our preliminary studies demonstrate that during starvation conditions UmuD is cleaved to UmuD' in a RecA\*-mediated fashion. These novel findings support activation of RecA by inorganic polyphosphate.

30. *A Feminist Critique of Joseph Heller's Catch-22*

Chelsey Clammer, Department of Feminist Studies and Department of English, Southwestern University

Mentor: David Gaines, Department of English, Southwestern University

Joseph Heller's *Catch-22* has been embraced by American readers both at its time of publication and in the present day. While the novel presents the reader with intelligent and creative critiques of war, there has never been a feminist critique of this novel. All of the women in the novel are presented as sexual objects that are used for the men's pleasure, and Heller assumes that his readers will discover that the women receive agency from their hyper-sexuality. This is problematic. A woman's agency can and should not be reduced to her sexuality. By critiquing Heller's representations of female characters, and the men that respond to these women, the belief that women's agency through sexuality is complicated through feminist perspectives, both past and present. While there have been some responses to the portrayals and representations of masculinity in the novel, a feminist perspective on these issues allows the reader to understand the relationship between the gendered characters. Through a criticism of gender roles and representations in *Catch-22*, the subject and deployments of grief in the novel can also be understood and recognized. Therefore, while previous critics of *Catch-22* have made interesting remarks about the structure and importance of this "war novel," this feminist critique allows the reader to go one step further and respond to the novel's commentary on the roles that men and women play in war and grieving.

31. Beyond Medea? The Struggle to Think Genealogically

Marie Draz, Department of Theatre, Southwestern University

Mentor: Sergio Costola, Department of Theatre, Southwestern University

This paper is divided into four sections. In the first section I give the results of research I did into contemporary performances of Medea. In the second section I turn to the original tale itself, Euripides' *Medea*, and to Jean Paul Vernant's *Myth and Tragedy in Ancient Greece*. I employ Vernant's work on the historical assumptions behind our theatre practices as a way of interrogating the concepts of time and space that contemporary performances of Medea, particularly the four examples I focus on in the first section, tend to evoke. Following this, I specifically question the concept of a "timeless" drama and clarify the concept of transhistoricity as it applies to the four contemporary performances that I focused on in the first section. Finally, in the fourth section I introduce Michel Foucault's "Nietzsche, Genealogy, History" in order to illuminate how the concept of genealogy can, especially when considered alongside Vernant's thoughts on transhistorical drama, illuminate many aspects of how we both view and participate in the study and performance of ancient drama. I end the paper by explicating some of the reasons that exploring the myth of timelessness is both important and necessary for contemporary theatre practitioners. The example of Medea that I offer in this paper allows us to glimpse a framework where the idea of continuity and origin is particularly strong. The struggle to think genealogically and to explore our conceptions of time and space could, I argue, loosen the power that these "timeless" ideas have over the kinds of stories, sentiments, and situations that we do create in the theatre, and the multitude of possibilities yet to be explored therein.

32. *The Elderly Needs Assessment*

Stefanie Foster and Jackie Diaz, Department of Psychology, Southwestern University

Mentor: Richard Osbaldiston, Department of Psychology, Southwestern University

The elderly have many different needs like transportation, help around their house, and many times financial difficulties making their life more difficult than others. To shed light on some of these unfamiliar issues, the purpose of the present study was to investigate the particular needs of the elderly population in a small town in Central Texas. As such, a sample of 68 elderly adults with the mean age of 79.4 years was obtained from Caregivers in Georgetown, Texas. They were interviewed and asked about their daily lives and activities. Basic information on living arrangements, health and medical care, daily activities, moods, attitudes, feelings, money matters, services needed, and social interaction were included in the survey. Statistical analyses using a chi squared were employed to determine any relationships among the factors. Results revealed a significant relationship between the safety of their neighbor and how safe they felt their home was. A significant relationship was also found between emotional health and physical health. Additionally, a significant positive relationship was found between overall health and emotional health. This study set the pace to help define the needs of the elderly so programs can be made to help the elderly in their everyday lives.

## ABSTRACTS: POSTER AND CREATIVE WORKS PRESENTATIONS

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33. *Quantification of Phthalate Ester Leaching from Tinted Polyethylene Terephthalate Bottles with Increased Ultraviolet Exposure*  
Blithe Casterline, Department of Chemistry, Southwestern University  
Mentor: Emily Niemeyer, Department of Chemistry, Southwestern University

Food and beverage packaging using poly(ethylene terephthalate) (PET) has become increasingly popular among consumers. In particular, most bottled water purchased in the U.S. is now in single-serving PET bottles. Plasticizers such as phthalate esters are commonly added to plastic packaging to give more desirable characteristics such as increased flexibility and shine. However, because plasticizers are not chemically bound to the plastic matrix, leaching from the polymer can occur. Consumption of phthalate ester plasticizers, particularly di(2-ethylhexyl) phthalate (DEHP) is a cause of public health concern due to its suspected carcinogenicity. This study uses solid phase extraction and GC/MS analysis to quantify the leaching of DEHP from tinted PET into bottled water as a function of ultraviolet light exposure.

34. *May Give Cues to Survival: N Vs. P Pesticides Uniquely Impact Reproduction in Daphnia Magna at Different Scales*  
Austin Hill, Department of Biology, Southwestern University  
Mentor: Romi Burks, Department of Biology, Southwestern University

Aquatic organisms confront many cues from both natural (predator) and anthropogenic sources. Each cue, singularly or in combination, may produce adverse or beneficial effects on the organism life history traits. We exposed *Daphnia magna* to treatments including odonate kairomone presence and absence with three different atrazine concentrations under the lethal dose (0.0, 0.5, 1.0mg/L). Both daphnia mothers and offspring reproduced earlier when exposed to the low concentration of atrazine compared to control conditions ( $p = 0.001-0.009$ ). Larger individuals occurred at first reproduction (FR) when exposed to high atrazine levels. Odonate cue presence independently influenced reproductive traits, exhibiting significant effects by producing less second clutch offspring ( $p = 0.042$ ), total offspring ( $p = 0.043$ ), and marginally less significant eggs in the juvenile first clutch ( $p = 0.090$ ) relative to treatments without cue. Interactive effects occurred in first clutch egg production and AFR, with larger differences between cue presence and absence treatments occurring at low atrazine ( $p=0.022$ ,  $p=0.001$ ). Differential atrazine concentrations more strongly altered life history traits in our experiments. On the population scale we also looked at methyl parathion, a common insecticide, under the lethal dose (0.0, 0.5, 1.0, 956;g/L) in addition to atrazine and kairomones. Odonate cue created larger population sizes at low and high concentrations of pesticides ( $p = 0.001$ ) as well as larger daphnia in the presence of low and high

pesticide concentrations ( $p = 0.035$ ). Larger populations occurred with methyl parathion versus atrazine ( $p = 0.002$ ). Methyl parathion in combination with kairomones creates a larger population compared to atrazine ( $p = 0.016$ ). In contrast to individual scale we found that atrazine and kairomones produced different results in the population most likely because of the presence of methyl parathion.

35. *The Influence of Religion on Young Women in Spain*  
Helen Escamilla, Department of Religion, Southwestern University  
Mentor: Julia Salazar, SIT Academic Director in Granada, Spain

When most people think of Spain, the phrase “Catholic Spain” comes to mind. With past leaders such as “The Catholic Kings” and the dictatorship of Franco, this phrase seems to encapsulate the history of Spain well. Being a religion major, while I was living and studying in Spain, I wondered if the same ideas still existed. I wondered what role religion, namely Catholicism, took in everyday life, especially in the lives of young women between the ages of 20 and 30. So, I composed a simple survey that I gave to young women in three different cities of Southern Spain. I also had informal conversations with two of my host sisters on the subject of religion and the function it played in their lives. The data collected from my interviewing and questionnaire turned out similar results. For the most part, the idea of Catholicism was important in these women’s lives. But, at this stage in their lives, they did not feel the need to practice it in any formal setting.

36. *Racism, Racial Inequality, Racial Tension and Violence in Small Texas High School*  
Erin Cooper, Department of Sociology and Anthropology, Southwestern University  
Mentor: Melissa Johnson, Department of Sociology and Anthropology, Southwestern University

I performed an ethnographic research project at Bay City High School in Bay City, Texas, to investigate the social dynamics, specifically race and race relations, within the institution. This encompassed racial composition of the school community, racial stereotypes, individual perceptions of race and racism, and conflict and violence related to racism within the school’s students, staff, faculty, and administrators. The questions I asked as the foundation of my ethnographic research at Bay City High School was as follows: I graduated from Bay City High School in 2002. My perception is that racial conflict and violence at Bay City High School has increased over the past few years. Do members of the Bay City High School community share this perception? What might some of the factors be that are contributing to this escalation? Using these questions as my primary plan of action pertaining to my research, I acquired information through participant observation of students, faculty, staff, and administrators in order to investigate the racial makeup, relationships, and interactions between them as well as through personal interviews with members of all four groups within the school community to investigate personal feelings on the issues I researched.

The purpose of my research project was to investigate why racial conflict and violence, and prejudice are all problems that dominantly plague the school systems of small towns in Texas. Through my research, I developed a better understanding of what

causes these problems, and what might lead to an escalation of racial tension and violence. I was also seeking a better personal understanding of how, through research, racial tension and conflict can be investigated and eventually alleviated. Hopefully, my research project will be enlightening not only to myself, but to my subjects, the students, faculty, staff and administrators of Bay City High School as well.

37. *Tangrams as Instruments for Teaching Students Mathematical Concepts*,  
Anna Ferrick, Department of Education, Southwestern University  
Mentors: Cami Sawyer, Department of Math and Computer Science and Michael Kamen,  
Department of Education, Southwestern University

Tangrams, math manipulatives based on an ancient Chinese puzzle, are often seen in their plastic version on the tables and desks of young children in school. Through developing ways to use this math manipulative puzzle, I realized many educators do not know the authentic mathematical value that tangrams can add to their teaching of students of all ages.

Tangrams are thought of as puzzles that have little mathematical value other than helping children learn their shapes through play. This work will challenge this presiding view of tangram use, while presenting their authentic mathematical value and providing actual classroom uses. For early learners, tangrams can be used to connect math to literature and culture, through learning about the history of the puzzle's creation. Young students also gain knowledge about angles found in shapes, a concept of conservation of area, geometric vocabulary, understanding of the spatial relationships of shapes, positive attitudes with mathematics, ability to think logically, development of fine motor skills, and knowledge of plane figure motions used in mathematics.

Older learners can expand true knowledge and understanding of the above concepts, and can add to their mathematical abilities through using tangrams for graphing shapes, creating scale drawings, and differentiating between convex and concave angles. Even high school teachers and college professors can use tangrams for solidifying geometric concepts with their mature students.

Creating lessons that engage the students with the tangram manipulative help students better connect abstract mathematical concepts with concrete ideas based on in their own hands' discoveries. Through researching tangram uses, I hope to help Texas teachers see effective uses of the tangram to get students to internalize math concepts, while aligning with our state's standards for learning.

38. *Motivation & Success*  
Charity Dugas and Audrey Hingle, Department of Psychology, Southwestern University  
Mentor: Richard Osbaldiston, Department of Psychology, Southwestern University

Research indicates that there is a connection between motivation and success. It follows that college students who are responsible for paying their own tuition may have more motivation to strive for success than would those who are not personally responsible for paying their tuition. In the present study, 120 undergraduate students from four Texas universities completed a one-page survey that assessed the student's individual success in addition to who was responsible for paying the student's tuition.

They were questioned about their individual success in areas including GPA, involvement in school-related activities, and leadership. There were also questions about finances regarding tuition payments. It was predicted that students who are responsible for paying their own tuition would show more signs of success than would those who are not responsible for paying their own tuition.

39. *Church Survey*

Chris Green, Department of Psychology, Southwestern University

Mentor: Richard Osbaldiston, Department of Psychology, Southwestern University

In the present quasi-experimental design, a church in Central Texas contacted a research team at a local university to help them design a survey to assess the members' motivations and attitudes toward church giving. The church had established a fund-raising campaign referred to as the "capital campaign" to raise money for church expansion. The team designed the survey to investigate why the church members have not given as much money as expected by church officials. The team collaborated in order to design the survey, which was then sent to the church for final inspection. Members were instructed not to put their names on the survey to keep anonymity. Unknown to the participants, the surveys were sent out in seven different colors according to the amount of the members initial pledge and whether or not they were on schedule their payments. The church leaders returned the surveys to the research team for analysis after they were all received. The project is currently in the data entry stage, but analyses testing the hypotheses will be presented.

40. *Assessment of Giving Patterns in Local Catholic Church*

Jessica DeFilippo and Lauren Sekel, Department of Psychology, Southwestern University

Mentor: Richard Osbaldiston, Department of Psychology, Southwestern University

Recent studies done by Hoge et al. (1996) show that there are a multitude of reasons that affect giving patterns among Catholic church patrons including age, income and sense of belonging and commitment. We had many hypotheses; we thought that a person's sense of belonging and commitment to the church would affect whether or not they gave. We also hypothesized that the more people knew about how their money was being used, the more they would give. And that the more they knew about the individual programs within the church that they were donating to, the more they would contribute. For our study, we used a 28 question survey, given out to 380 parishioners at a local Catholic church to test our hypotheses. We found a significant relationship between the parishioner's sense of belonging and commitment and whether or not they donated. We also found that the amount donated depended more on the parishioners knowledge of the individual programs as opposed to how the money they donated was being used.

41. *Running in the Family or Swimming in the Gene Pool: The Role of Family History and Genetic Risk in Individuals' Illness Perceptions*  
Abigail Riggs, Department of Psychology, Southwestern University  
Mentor: Traci Giuliano, Department of Psychology, Southwestern University

The present study sought to determine whether individuals who have a family member with a disease will automatically assume that they personally have the disease gene. As part of a 2 X 3 mixed-subjects design, participants read three scenarios which asked them to imagine that their mother had a hypothetical disease gene, that she simply had the disease, or that neither parent had the disease; in addition, their parents' lifestyles were described as either unhealthy or healthy. Participants then answered questions about their risk for the disease, their perceived control over developing the disease, the importance of contributing factors, and the effectiveness of preventive behaviors. Because the connection between behavior and bad health is more salient when a person has an unhealthy rather than a healthy lifestyle, we expected that participants who read the ambiguous family history information would feel more control over the disease when the parents' lifestyles were unhealthy than when they were healthy. However, we predicted that parental lifestyle would have no effect when participants received genetic or no history information.

As predicted, participants who received ambiguous family history information felt controllable contributing factors were more important and behavioral changes were more effective when their parents' lifestyles were described as unhealthy rather than healthy. However, there were no significant interactions for perceived risk or control over developing the disease. These results suggest that individuals can distinguish between a family history of disease and an explicitly genetic risk when considering individual factors that affect the disease outcome, but not when considering their risk or control more generally. As such, it is important for individuals with a family history of disease to think carefully about each factor that can influence their risk so that they can form a more accurate picture of their risk and prevent illness more effectively.

42. *Factors that Influence Sexually Risky Behavior Among College Students*  
Molly Peterson, Megan Browning, Brandy Ledbetter, Mary Beth Pinnell, Tessia Trejot, and Glynnis Zarria, Department of Psychology, Southwestern University  
Mentor: Bryan Neighbors, Department of Psychology, Southwestern University

Recent research indicates that the sexual practices of college students often place them at risk for unwanted pregnancy and sexually transmitted diseases. For example, in a recent study published in the American Journal of Health Behavior, 95% of the 761 sexually active undergraduate women reported having engaged in intercourse without a condom, 32% had engaged in anal intercourse (68% of those reported never using a condom), and 26% had contracted a sexually transmitted infection. Because such sexual risk-taking practices can result in dangerous repercussions to both physical and mental health, it is important to understand the factors that contribute to the etiology and maintenance of sexually risky behavior. However, the characteristics associated with risky sexual behaviors are not well-studied, and the present study thus sought to identify possible correlates of sexual-risk taking among college students. Based

on Bowlby's attachment theory, it was hypothesized that less security in parental attachment relationships would be associated with more sexually risky behavior. It was also hypothesized that lower levels of maturity in ego identity development and greater influence from sexually active peers would be associated with greater sexual risk. A packet of self-report questionnaires designed to assess the above areas was completed by 332 undergraduate students. Students signed informed consent, completed the questionnaires on their own, and turned them in to a faculty secretary to ensure the anonymity of their participation. The project is currently in the data entry stage, but analyses testing the stated hypotheses will be presented.

43. *Who am I? The Construction of Ethnic Identity Among Latinos*  
Leslie Cuellar, Department of Psychology, Southwestern University  
Mentor: Richard Osbaldiston, Department of Psychology, Southwestern University

The Latino population is one of the fastest growing minority groups in the United States in which there are numerous terms used for its designation. This study examines the many factors that motivate people to identify with an ethnic group, with a main focus on Latinos. The construction of Latino ethnic identity was evaluated, through the use of surveys, across a sample of 60 participants (aged 18-60 yrs) at a Latino heritage conference held at a small university in Central Texas. The results found that location, education level of participant and participant's parents, feelings of acceptance, and the participant's generation of residing in the U.S. are important factors, which determine how Latino's identify themselves.

44. *Size Matters: Perception of Nutrition through Serving Sizes*  
Emily Taylor and Mark Morrow, Department of Psychology, Southwestern University  
Mentor: Richard Osbaldiston, Department of Psychology, Southwestern University,

Although both health and nutrition attract a lot of media attention in our society today, much confusion still surrounds people's conceptions of what constitutes healthy versus unhealthy foods. In fact, it is quite likely that the average consumer may actually overlook the primary factor in weight loss, which is caloric content per serving. The purpose of the present study was to discover if differences in suggested serving size affects an individual's perception of the nutritional value of identical foods. To investigate this phenomenon, a survey was created to assess participants' ratings of various nutrition labels, which were based on scales of how "healthy", "fattening", and "nourishing" each food was perceived to be. Each food had two nutrition labels: a small serving size and a large serving size. The survey was administered at a small liberal arts university, a suburban health club, and a grocery store.

45. *Assessing Elderly Needs in Georgetown*  
Brandi N. Tennant, Department of Psychology, Southwestern University  
Mentor: Richard Osbaldiston, Department of Psychology, Southwestern University

The elderly have ever-changing needs in our society and as the baby-boomers become part of the young-old generation, there will be a drastic increase in the number of elderly present in our society. The purpose of this study is to assess the needs of the elderly in Georgetown, Texas, in hopes that further research will help in the development of improved programs and services for the senior community. The study included 68 older people (65+) who were interviewed in order to assess the immediate needs of the elderly in Georgetown, Texas. Student teams designed questions regarding housing, health and medical care, daily activities, everyday feelings, financial planning, services, and community involvement. Interviews were conducted at the Wesleyan Center, Madella Hilliard Center, Getsemani Center, and the McCombs Campus Center. Among the participants interviewed transportation was seen as a major need and problem. Significant relationships were seen in the health and medical care, daily activities, and everyday feelings categories. Results from this study may tailor the development of services and programs by Georgetown Caregivers and later serve to inspire other communities to survey the needs of the elderly in their area.

46. *Characterization of the Escherichia coli B UmuD gene and gene product: implications and regulation of SOS mutagenesis*  
Elizabeth Williams, Department of Biology, Southwestern University  
Mentor: Martín Gonzalez, Department of Biology, Southwestern University

In the bacterial *Escherichia coli* K-12 strain, DNA-damage induced mutagenesis requires the activity of the UmuDC proteins (also known as DNA polymerase V). Both UmuD and UmuC have been shown to be highly unstable and substrates of the Lon protease. The Lon protease is important in regulating the cellular levels and therefore the cellular activity of UmuDC. Interestingly, *E. coli* B strains undergo UmuDC-mediated mutagenesis, yet are deficient in Lon protease activity. The lack of Lon protease activity results in slightly higher levels of UmuDC mutagenic activity when compared to *E. coli* K-12 strains. This report describes the cloning and DNA sequencing of the *E. coli* B UmuD gene. We compare and discuss the level of homology (i.e., similarity) between the UmuD DNA sequences of the two *E. coli* strains. Moreover, we also will present data comparing the relative stability of the UmuD proteins from the differing *E. coli* strains.

47. *Synthesis and Characterization of Mixed Ligand Complexes of Ruthenium(II) with DNA Binding Properties*  
Bhavik Kumar and Coty Maypole, Department of Chemistry, Southwestern University  
Mentor: Gulnar Rawji, Department of Chemistry, Southwestern University

Several ruthenium(II) complexes containing ligands that can potentially intercalate with DNA (L, L', and L'') and ancillary ligands such as bipyridyl (bpy) or 1,10-phenanthroline (phen) were prepared. The ligands with intercalating properties

were  $L = 2$ -(2 pyridyl)benzimidazole (pbim),  $L' = N,N'$ -bis(salicylidene)-1,2-phenylenediamine

(sal-phen), and L'' = 2,2-biquinoline (bqn). The complexes were characterized by spectroscopic methods (UV-vis, IR, and <sup>1</sup>H NMR), elemental analysis, and cyclic voltametry. Since these complexes were also photoemissive, their photochemical properties were also investigated. The presentation will include synthetic schemes, characterization data and results of photochemical studies.

48. *Beyond the Picket Lines: The Relationship Between Self-Monitoring and Political Activism Among College Students*

Shelly Tang and Andrew Yusran, Department of Psychology, Southwestern University  
Mentor: Traci Giuliano, Department of Psychology, Southwestern University

A survey research design was used to examine the extent to which self-monitoring predicts political activism. Self-monitoring refers to individual differences in the use of situational cues to control for expressive behavior and self-presentation so that it is socially acceptable (Snyder, 1974). Specifically, individuals high in self-monitoring tend to modify their attitudes and behaviors to fit various situations, whereas individuals low in self-monitoring tend to remain consistent regardless of the situation (Gangestad & Snyder, 2000; Snyder, 1974; Snyder & Kendzierski, 1982). This inconsistency between the attitudes and behaviors of high self-monitors is associated with a lower level of commitment (Day, Schleicher, Unckless, & Hiller, 2002; Leon & Hall, 2003). Because involvement in political activities clearly indicates support or opposition towards a political issue, it follows that high self-monitors would have to be capable of verifying their position on a controversial topic as well as willing to risk social disapproval. A convenience sample of 95 undergraduates (49 women, 45 men, and 1 unreported) completed a questionnaire that assessed their level of self-monitoring and political activity. Self-monitoring was measured using one item from a revised version (Snyder & Gangestad, 1986) of the original Self-Monitoring Scale (Snyder, 1974), and political activism was measured using four items from the Activism Orientation Scale (Corning & Myers, 2002). As predicted, the results revealed a negative relationship between self-monitoring and political activism,  $r(92) = -.26, p = .005$ . That is, high-self monitors reported being less politically active than low self-monitors. Because the current study examined relatively unobtrusive measures of political activism (e.g., displaying political bumper stickers), future research should explore the relationship between self-monitoring levels and involvement in a broader range of political activities. Nevertheless, the current findings provide insight into one of the many underlying factors that may promote or motivate political participation.

49. *Effect of Power Rack™ Training on Swimming Stroke Rate*

Graham Ice, Department of Kinesiology, Southwestern University  
Mentor: Scott McLean, Department of Kinesiology, Southwestern University

Swimming speed is a function of stroke length (SL) and stroke rate (SR). A change in either factor will result in a change of swimming velocity. Various coaching methods have been used to optimize SR and SL. The Power Rack™ (Total Performance, Inc. Mansfield, Ohio) speed assist training system is a training device that allows the swimmer to work against a resistance while performing natural swimming movements.

While this device has been used to improve swimming performance as measured by time, little work has examined what mechanical characteristics of swimming are affected by training with it. **PURPOSE:** To examine the effect of Power Rack™ training on stroke rate in competitive swimmers. **METHODS:** Six healthy collegiate level swimmers ( $20.2 \pm 1.0$  yrs,  $69.7 \pm 9.5$  kg,  $1.72 \pm 0.07$  m) completed multiple swims in a flume at speeds ranging from 0.8-2.3 m/s in increments of  $\sim 0.2$  m/s. Each swim lasted  $\sim 20$ -30s during which stroke rate was defined as the time needed to complete 10 stroke cycles. A linear least squares approximation of the relationship between speed and stroke rate was used to determine the stroke rate at a swimming speed of 1.5 m/s. Each participant was evaluated prior to and after a four-week training period. Four swimmers participated in three 20-minute Power Rack™ training sessions per week in addition to their normal swimming training. The remaining two subjects served as a control group and only participated in their normal swimming training for the four-week training period. Each Power Rack™ training session was uniform in number and frequency of trials. However, resistance used in each trial was set at a corresponding level for each subject's ability. A 2 x 2 mixed model ANOVA was used to evaluate the differences between groups and between pre- and post-training SR's at 1.5m/s. **RESULTS:** SR at 1.5 m/s was not significantly different between groups ( $p=0.44$ ). SR at 1.5 m/s decreased by 8.4% for the training group after the training period ( $p=0.3$ ,  $ES=0.52$ ) but was unchanged in the control group ( $p=0.3$ ,  $ES=0.08$ ). **CONCLUSION:** Although Power Rack™ training yielded no significant difference on SR, the effect size comparisons suggest that use of a Power Rack™ training system produced a noticeable decrease in SR, which would correspond to an increased SL.

50. *DNA Binding Studies of [Ru(sal-phen)Cl<sub>2</sub>]*  
Coty Maypole, Department of Chemistry, Southwestern University  
Mentors: Gulnar Rawji and Maha Zewail-Foote, Department of Chemistry and Biochemistry, Southwestern University

The DNA binding properties of [Ru(sal-phen)Cl<sub>2</sub>] (where sal-phen is N,N' bis (salicylidene)-1,2- phenylenediamine ) were investigated using UV-Visible and fluorescence spectroscopies and gel electrophoresis. Bathochromic shifts as well as hypochromism observed in the UV-Visible spectra indicate interaction between the metal complex and DNA. The UV-Visible spectra also reveal two isobestic points suggesting two bound forms in addition to the unbound. The binding constant,  $K_b$ , was estimated to be  $6 \times 10^5$ , which is suggestive of relatively strong intercalation by the metal complex.

In addition to the data from this studies, results from parallel studies with [Ru(salen)Cl<sub>2</sub>] (where salen is N, N'-bis (salicylidene) ethylenediamine) conducted to evaluate the involvement of the phenylenediamine ring will also be presented.

51. *Prejudice and Partisanship: The Connection Between Racial and Political Attitudes*  
Carlee McConnell and Elissa Lewis, Department of Psychology, Southwestern University  
Mentor: Traci Giuliano, Department of Psychology, Southwestern University

Racial discrimination in America is often overlooked because it is expressed covertly in a form known as modern racism (McConahay, 1967). Despite its subtlety, modern racism can have powerful reverberations, especially when present within the U.S. government. Government officials' attitudes toward race can directly influence racial policies, making it crucial that voters are aware of any connection between political party and racism. Political conservatives have previously been shown to demonstrate more racial prejudice than political liberals (Allport, 1928). For example, Republicans reported more prejudiced attitudes than Democrats in the 1972 U.S. Presidential election (Brigham and Severy, 1976). Since 1972, however, there has been a dearth of research investigating this topic. As such, the current study examined the relationship between racial attitudes and political orientation in the 2004 U.S. Presidential election. A questionnaire was distributed to 95 undergraduate students (49 women, 45 men, and 1 unreported) to measure their attitudes on race and politics. Racism was measured using 4 items from the Modern Racism Scale (McConahay, 1986;  $\alpha = .79$ ) and political attitudes were measured using direct questions about candidate preference as well as items from a liberalism/conservatism scale (Kerlinger, Shaver, & Wrightsman, 1984;  $\alpha = .81$ ). As predicted, a positive correlation was found between racism and conservatism,  $r(92) = .50, p < .001$ , and between racism and support for George W. Bush,  $r(92) = .54, p < .001$ . In contrast, a negative correlation was found between racism and support for John Kerry,  $r(92) = -.37, p < .001$ . Future research should investigate the extent to which a politician's personal beliefs are reflected among his or her constituents and in his or her political decisions. Understanding one's racial attitudes is particularly important because politicians have the power to either reduce or perpetuate racial inequalities.

52. *Estimating Exercise VO<sub>2</sub> Using Backward Extrapolation of Post-Exercise VO<sub>2</sub>*  
Lisa A. Long, Department of Kinesiology, Southwestern University  
Mentors: Jimmy C. Smith and Scott P. McLean, Department of Kinesiology, Southwestern University

**PURPOSE:** To determine if backward extrapolation can provide accurate estimates of exercise VO<sub>2</sub> at various intensities and, if so, to examine the effect of varying post-exercise collection periods on VO<sub>2</sub> estimates. **METHODS:** Nine men and five women performed a VO<sub>2</sub>max test on a cycle ergometer and tests at 40%, 60%, and 80% of their VO<sub>2</sub>max on a subsequent day. Expired gases were analyzed throughout exercise and for two min following the end of exercise. Breath-by-breath post-exercise data for 15, 30, 45, 60, 75, and 90 s intervals were fitted to a linear regression equation and were used to estimate exercise VO<sub>2</sub>. Separate one-way repeated measures ANOVAs were used to determine the effect of sampling period within each exercise intensity. **RESULTS:** Across all intensities, ANOVAs indicated that significant differences

( $p < 0.01$ ) were present among the VO<sub>2</sub> values. In addition, there was a tendency for estimated values to be lower

than the exercise values within each intensity. Tukey post-hoc tests suggested that this tendency was exacerbated as the length of the recovery collection period increased and that the 15sec estimate was significantly different only from the maximal exercise value.

DISCUSSION: These results suggest that the VO<sub>2</sub> associated with submaximal exercise can be accurately estimated from a short 15 s post-exercise sampling period.

53. *Trace Element Analysis Using Neutron Activation Analysis*

Derek Fletcher, Department of Physics, Southwestern University

Mentor: Steven Alexander, Department of Physics, Southwestern University

The plant *Brassica juncea* is being considered for environmental cleanup of heavy metals. Several plants were grown for two weeks under controlled conditions in a bio-growth chamber with different concentrations of nickel acetate in the soil: 0\_M, 50\_M, 100\_M, 150\_M, 200\_M. These plants were then dried and digested in concentrated nitric acid, diluted and poured into centrifuge tubes. Neutron activation analysis will be used to determine the concentration of nickel that was absorbed by the plants.

54. *Missorting of Cathepsin-L in ras-Transformed Mouse Fibroblasts Possibly Related to Underexpression of ADP-Ribosylation Factor 1*

Jarin R. Gillis, Department of Chemistry and Biochemistry, Southwestern University

Mentor: Kerry A. Bruns, Department of Chemistry and Biochemistry, Southwestern University

Previous studies have indicated that viral transformation of some cells leads to the secretion of certain lysosomal hydrolases. Kirsten sarcoma virus-transformed 3T3 fibroblasts (KBALB) were observed to secrete one such protein, pro-cathepsin L. In this study, we analyzed the trafficking of cathepsin L in KBALB and nontransformed BALB/3T3 cells to determine the mechanism responsible for the secretion of this lysosomal cysteine protease. The GTP binding, ADP-ribosylation factor (Arf) plays a key role in the sorting of mannose 6-phosphate containing glycoproteins such as cathepsin L. Western blot analysis confirms missorting of cathepsin L in our transformed cells. Western blot analysis for Arf also reveals that Kirsten virus-transformed cells underexpress this protein relative to BALB cells. We discovered a difference in the cellular localization of a transcription factor, myc, and its active phosphorylated form, p-myc, in KBALB cells and BALB cells. These findings suggest the possibility that ras transformation alters Arf expression at the transcriptional level. Northern analysis of Arf 1 mRNA is underway to test this hypothesis.

55. *Numerical study of pattern-formation in bacteria models*  
Kristen Johnson, Misti White, Alyssa Pampell, Department of Mathematics and Computer Science, Southwestern University  
Mentor: Anand Pardhanani, Department of Mathematics and Computer Science, Southwestern University and University of Texas

Bacteria such as *E. coli* and *Salmonella*, under certain environmental conditions, have been observed to form a wide range of patterns in laboratory experiments (Budrene and Berg, 1995). These patterns evolve with time, and range from highly regular and symmetric, to weakly symmetric, to completely irregular. The development of mathematical models to explain the formation of these patterns, and to investigate their dynamics, is an area of current research interest. In this work we focus on numerical simulation of partial differential equation (PDE) models taken from the published literature for such bacteria. One of the key mechanisms that is thought to contribute to pattern formation in these bacteria is chemotaxis, which is a special kind of process by which the bacteria migrate up the gradients of an attracting chemical. An unusual feature of this application is that the attracting chemical (chemoattractant) is secreted by the bacteria themselves. This is the key explanation for why the patterns exhibit the tendency to aggregate in local clusters.

Mathematical models for chemotaxis are based on second order PDE terms, and they look somewhat similar to nonlinear diffusion operators. The full PDE models for *E. coli* and *Salmonella* are, therefore, classified as reaction-diffusion-chemotaxis models. There are many interesting issues and challenges that arise in numerically modeling and simulating these PDE systems. Our plan is to choose a specific bacteria PDE model, such as *E. coli*, and develop a numerical simulation of its activity under certain environmental conditions. Using this numerical simulation we will be able to study the effect of model parameters on bacteria patterns and the effect of numerical parameters.

56. *Quantification of Catechins in Consumer Beverages Using High-Performance Liquid Chromatography*  
Kristen Carranco, Coty Maypole, and Lynn Tarkington, Department of Chemistry, Southwestern University  
Mentor: Emily Niemeyer, Southwestern University, Department of Chemistry, Southwestern University

Catechins, which are present in commonly consumed beverages, are known to possess several health benefits. High-performance liquid chromatographic (HPLC) analyses of apple juice, tomato juice, grape juice, red wine, blackberry black tea and mixed berry green tea for three catechins ((+)-catechin hydrate, (-)-gallicocatechin, and (-)-epigallocatechin gallate) were conducted. Mixed standards of the listed catechins were prepared in the range of 0 mg L<sup>-1</sup> to 100 mg L<sup>-1</sup> with methanol/citric acid solution. Tea samples were diluted with methanol/citric acid solution while the remaining samples were prepared using a methanol/water solution. Using a gradient elution system of acetonitrile-phosphate buffer (0.025M) and a C18 column, all catechins were separated within six minutes. The results showed that (-)-gallicocatechin eluted first, followed by (+)-catechin

hydrate and (-)-epigallocatechin gallate. The two types of tea showed the highest level of the three total catechins (~220-255 mg L<sup>-1</sup>) where as the tomato juice contained the lowest concentration of catechins (~4.5 mg L<sup>-1</sup>). This HPLC method demonstrated to be an efficient technique for analyzing catechins in consumer beverages.

57. *Reaction of alpha-acetoxytamoxifen with DNA: Recognition and structural effects of covalent modification*

Sarah Smith, Department of Chemistry, Southwestern University

Mentors: Lynn Guziec, Department of Chemistry, Martin Gonzalez, Department of Biology, Maha Zewail-Foote, Department of Chemistry, Southwestern University

The non-steroidal anti-estrogen drug tamoxifen has been associated with an increased incidence of endometrial cancer, presumably due to covalent tamoxifen-DNA adducts that arise from the reaction of metabolically activated tamoxifen derivatives and DNA. Metabolites of tamoxifen such as alpha-acetoxytamoxifen have been shown to preferentially react with deoxyguanine. A gel electrophoresis mobility shift assay using both native and denaturing gels was established to detect the presence of tamoxifen-DNA adducts. Alpha-acetoxytamoxifen retarded the electrophoretic mobility of single stranded and double stranded oligonucleotides. The results show that the reaction of Alpha-acetoxytamoxifen with DNA is irreversible even under denaturing conditions. This band shift assay can be used to further characterize the sequence selectivity and structural changes induced by the covalent reaction of alpha-acetoxytamoxifen with DNA.

58. *Effect of Over-training on Psychology, Physiology, and Biomechanics of Collegiate Swimmers*

Jessica Lovorn, Department of Psychology and Department of Kinesiology, Southwestern University

Mentors: Scott McLean, Department of Kinesiology, Southwestern University  
John Bartholomew, University of Texas at Austin

Over-training, defined as a substantial increase in volume, results in a negative shift in the affective state of an athlete. **PURPOSE:** To assess if the negative affective shift due to over-training is related to physiological or biomechanical markers. **METHODS:** Ten collegiate swimmers (mean age=19.5±1.26) completed a six-day training period during which daily training volume increased 49% over the previous training cycle. Two dimensions of affect, pleasure-displeasure and sleepiness-arousal, were measured daily using the Affect Grid (Russell et al., 1989). Biomechanical markers of swimming performance included average stroke rate and speed during the middle 91.5 m portion of a 366 m swim at a self-selected pace completed at the beginning of each workout. Physiological markers of stress, salivary cortisol and alpha-amylase, were collected daily upon waking. One-way repeated measures ANOVA were used to assess changes in affect, cortisol and alpha-amylase levels, stroke rate, and speed. **RESULTS:** By the midpoint of training, pleasure-displeasure affect and sleepiness-arousal affect were reduced by 14% (p=0.07, ES=0.98) and 16% (p=0.012, ES=0.84), respectively. Self-selected swimming speed was decreased by 4.6% (p=0.007, ES=0.6) by the

midpoint of training. This reduction in speed was not due to changes in stroke rate which remained

unchanged ( $p=0.78$ ,  $ES=0.2$ ) suggesting that changes in stroke length were responsible. Neither salivary cortisol ( $p=0.86$ ,  $ES=0.37$ ) or alpha-amylase ( $p=0.75$ ,  $ES=0.07$ ) levels changed significantly by the midpoint of training. While pleasure-displeasure ( $p=0.78$ ,  $ES=0.12$ ) and sleepiness-arousal ( $p=0.78$ ,  $ES=0.13$ ) affect recovered by the end of the training period, self-selected swimming speed did not ( $p=0.02$ ,  $ES=0.27$ ).

DISCUSSION: An isolated period of substantially increased training volume resulted in a suppression of both dimensions of affect, but not physiological markers of stress. The suppression in affect correlates with a slower self-selected swimming speed at the midpoint of training. This suggests that over-training has negative consequences that appear by the middle of training, but the swimmers recover from these effects by the end of over-training. The athletes were aware of the substantial increase in volume associated with over-training but that this would be followed by a return to normal training volume. This suggests that the swimmers' expectations could explain the rebound of affective responses to pre-training levels. The lack of correlation between psychological and physiological markers of stress suggests that further research should examine the relationship of these measures.

59. *UV Exposure to Clear PET Water Bottles and its effects on the Migration of Phthalate Ester Plasticizers*

Sarah R. Sher, Department of Chemistry, Southwestern University

Mentor: Emily Niemeyer, Department of Chemistry, Southwestern University

This study quantified phthalate ester migration from Aquafina® poly (ethylene terephthalate) bottled water exposed to UV radiation. The time periods and levels of UV radiation exposure were determined based on average UV-B levels recorded in Georgetown, Texas. The phthalate ester compounds were extracted from the bottled water samples using solid phase extraction (SPE) and identified using gas chromatography and mass spectrometry (GC/MS). The primary phthalate of interest in this study was di-ethylhexyl phthalate (DEHP). DEHP was found in concentrations exceeding EPA drinking water standard levels in extractions of bottled water samples exposed to 0, 6, 12, 18 and 24 hours of UV radiation. High concentrations of DEHP in bottled water are a direct health concern because DEHP has been previously found to disrupt normal estrogen and androgen activity as well as affect reproductive development in a number of cytotoxic studies.

60. *Using Dalton's Law of Partial Pressures to Determine the Vapor Pressure of a Volatile Liquid*

Brent Wilson, Department of Chemistry, Southwestern University

Mentor: Fred Hilgeman, Department of Chemistry, Southwestern University

Volatile liquids achieve an equilibrium between their liquid and vapor phases, this equilibrium results in a certain vapor pressure which is specific for each volatile liquid. A method which is commonly used to measure this vapor pressure

involves a monometer and relatively complex calculations, but a simpler method, using Dalton's Law of Partial Pressures and assuming the gas behaves ideally, can be used. By injecting a small known volume of air into a calibrated, sealed burette and measuring the volume displaced in the burette after waiting a few minutes for equilibrium to be reached, the vapor pressure of volatile liquids can be determined with simple calculation. This simplicity allows for even first-year chemistry students to use the procedure to determine vapor pressures, and gain a better understanding of Dalton's Law. In fact some of Southwestern's first-year chemistry students have used this method to determine the vapor pressure of acetone.

61. *From College Republicans to Young Democrats: Explaining Changes in Voting Preference Over Time in University Students*  
Sarah C. Gomillion and Kathryn R. Cubage, Department of Psychology, Southwestern University  
Mentor: Traci Giuliano, Department of Psychology, Southwestern University

Numerous studies have shown that college students' attitudes and beliefs change from their first to last years in school (Biddle, Bank, & Slavings, 1990; Chickering & McCormick, 1973; Lottes & Kuriloff, 1994; Prager, 1984). One such change is that the student population at a given school typically becomes more liberal as the students advance in grade level (Chickering & McCormick, 1973; Lottes & Kuriloff). The purpose of the present study was to examine attitudinal change at a small liberal arts university in Texas by assessing whether year in school predicted voting preference in the 2004 presidential election. In this correlational study, 95 university students (45 men, 49 women, and 1 unreported) completed a survey of political attitudes. In light of the finding that students become more liberal later in their college career (Chickering & McCormick, 1973; Lottes & Kuriloff), it was hypothesized that as students' year in school increased, they would be more likely to vote for the democratic candidate, John Kerry. Although the results failed to support our prediction in regard to voting behavior, the findings did confirm that first-years and sophomores were more conservative than their upper-level counterparts,  $r(90) = -.19$ ,  $p = .03$ . Interestingly, then, despite the fact that political attitudes were correlated with length of time in college, the participants' voting preferences were unrelated to year in school. As such, factors that may account for the discrepancy between voting preference and ideology, such as characteristics of the 2004 election and the possibility of participants being uninformed about the election are discussed. The implications of this study are also considered. Specifically, the finding that students' attitudes change during their college years suggests that university administrators and faculty may contribute to students' moral education, and therefore have an obligation to assess the values they are communicating.

62. *The Interactions Between Conservation Efforts and Local Communities*  
Claire Phillips, Department of Anthropology, Southwestern University  
Mentors: Melissa Johnson, Department of Sociology and Anthropology, Southwestern University, and Muhammad Jama, Minnesota Studies in International Development, Kenya

My poster will address ecotourism and conservation efforts, what attempts are being made to involve the local communities with these efforts and what happens when the two interests are in conflict. My poster will be based upon a month's field research in November 2004 in and around an elephant sanctuary in Kenya, during which time I assisted in the daily running of the sanctuary, learning how their program was conducted. I will specifically be looking at what kind of conservation efforts Mwaluganje Elephant Sanctuary has employed. I was also able to observe how the organization interacts with the local community as I had been invited to sit in on district meetings between the local community and the sanctuary. I am developing my analysis further through my capstone, which is being completed Spring semester of 2005, as I put my findings in conversation with the literature on conservation and community.

63. *Serotonin in the Medial Preoptic Area Contributes to the Sensitivity of Female Rats to Sexual Stimulation During Paced-Mating Behavior*  
Brittany Mason, Anastasia Benson, Department of Psychology, Southwestern University  
Mentor: Fay A. Guarraci, Department of Psychology, Southwestern University

Previous studies have suggested that the medial preoptic area (mPOA) is important for integrating somatosensory signals from coital stimulation with the motor responses associated with the proceptive aspects of female sexual behavior (Guarraci and Clark 2005; Guarraci, Megroz and Clark, 2004; Yang and Clemens, 2000). However, little is known about the influence of serotonergic neurotransmission in the mPOA during paced-mating behavior. The present study was designed to evaluate the role of serotonin in the mPOA on paced-mating behavior in ovariectomized rats primed with estrogen and progesterone. Female rats were tested for paced-mating behavior following bilateral intra-mPOA infusions of the selective serotonin reuptake inhibitor, fluoxetine hydrochloride (3 micro grams/0.2 micro liters) or artificial cerebrospinal fluid (aCSF). Female rats were tested for a total of 30 minutes, approximately 3 ejaculatory series, following infusions. As predicted, infusions of fluoxetine hydrochloride into the mPOA lengthened significantly contact-return latencies after the first ejaculation compared to vehicle infusions; a result similar to the effects of mPOA lesions on paced-mating behavior (Guarraci, Megroz and Clark, 2004; Yang and Clemens, 2000). No differences were observed between rats receiving fluoxetine or aCSF following subsequent ejaculations. The results of the present study suggest that serotonergic neurotransmission in the mPOA contributes to the sensitivity of female rats to sexual stimulation during mating. *Supported by the National Science Foundation.*

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