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* Denotes double major

AMERICAN CULTURAL STUDIES

Daniel M. Spurling

Advisor: Stacy L. Smith

Multicultural Content in American History Textbooks

From Addison Wesley to Harcourt Brace, commercial textbook publishers function as primary providers of curriculum to students in American classrooms. Thus, multicultural reform of textbooks would provide a means to effecting broader-based social reform. This thesis inquiry engages several commercially-published, primary-level United States history textbooks in a content analysis, seeking to qualitatively evaluate the extent and modes of integration of multicultural content. The thesis builds a constructive critique of textbook curricula, and points the way to an effective course for future curricular development.

ANTHROPOLOGY

Michelle A. Campbell

Advisor: Bruce A. Bourque

Seasonality Analysis of Prehistoric *Mya arenaria* Harvesting on the Fox Islands, Penobscot Bay, Maine

The Fox Islands, located in Penobscot Bay, Maine, were home to Native Americans for almost 5,000 years. This is in part due to the unique habitat that the Gulf of Maine makes possible through nutrient rich tidal mixing, thus supporting many species of marine life. The prehistoric populations that lived and used the gulf were hunter-gatherers. Using anthropological models and archaeological data, it is likely that these people were organized, during occupation of the littoral zone, as male-led bands of nuclear to slightly extended families, approximately 30 people. At the sites on the Fox Islands which date to the Ceramic Period (3000 B.P. - 500 B.P.), large mounds of shell refuse have preserved bone artifacts which would, in the absence of shell, normally decay and not be found by archaeologists. Due to this phenomenon, archaeologists are able to recover bones from fish, birds, and mammals that made up a large portion of the prehistoric diet and can also indicate season of death and thus season of occupation. The shells, commonly *Mya arenaria*, can also be studied for season of harvest. This thesis conducted a laboratory procedure on over 300 *Mya arenaria* shells to determine season of harvest. The shells were cleaned, embedded in epoxy, sectioned, polished, etched, and imprinted on acetate. With the use of new computer technology, more accurate measurements of growth lines were taken than has been previously possible with the traditional ocular micrometer. This data will be used to indicate season of occupation by native populations in conjunction with other faunal data to support the theory that Native Americans occupied the coastal region on a year-round basis. While relatively simple, this theory is in direct opposition to the common misconceptions held by the general public and academics alike. Therefore, it is the goal of this thesis to present data supporting previous work on year-round coastal occupation and to further the discussion of the hunter-gatherer model.

Karen J. Fletcher

Advisor: Charles V. Carnegie

Women and 'Zuo Yue Zi': Contemporary Dialogues of Change in a Taiwanese Postpartum Practice

This thesis will explore the patterns of change in a Taiwanese postpartum practice, *zuo yue zi*, and how these changes relate to and/or reflect the changing status of women in Taiwanese families. By first examining the structure of traditional Chinese patriarchal families and how this cultural practice grew out of and was shaped by this structure, I will then look at the patterns of change in contemporary Taiwanese families and their relation to current practices of *zuo yue zi*. A major part of the research for my thesis comes from the ethnographic fieldwork done this past summer in Taiwan. Living and working with the women of three different families, I not only witnessed the postpartum practice first hand, but also talked with women of various ages about their personal postpartum experiences. Drawing in large part on the case studies of two women, one in her fifties and one in her early thirties, as well as on literature discussing women and modern socioeconomic changes in Taiwan, I will look for the patterns and contradictions in *zuo yue zi* practices as they relate to women's changing family status.

Jeremy M. Poore

Advisor: Loring M. Danforth

Developing Rain Forests: A Post-Modern Analysis of an NGO Project in Ecuador's Amazon Basin

This thesis, which is based on six months of fieldwork in the Amazon Basin of Ecuador, analyzes the intricacies of development practices that are currently changing the area in fundamental ways. The history of development in Ecuador provides the basis for a critical interpretation of the practices of a small non-governmental organization located among nearly thirty communities on the Napo River. I use postmodern critiques of development to make evident the role of power between the 'developer' and the 'developing' and to determine the negative effects that accompany the discourse of development. I focus my analysis on several of this organization's projects including the introduction of ecotourism, health care, and micro-enterprise to the community of Mondaña located within these thirty communities. These projects were initiated by foreigners to the area and are each current trends within the discourse of development. It is my contention that due to the trendy nature of these projects and the fact that they were designed from the outside, they are therefore imposing a power relationship in which local people are the subordinates to an external force.

ART

Marian E. Drake

Advisor: Erica Rand

Jacques de la Villeglé's *Affiches Lacérées*: (Recomposing) Shreds of Popular Culture in Mid-Twentieth Century France

Jacques de la Villeglé began collecting previously lacerated advertising posters in the streets of Paris in the early 1950s. He reassembled these posters, torn by random passersby, thus allowing for alternative interpretations of these images as works of art. Villeglé proclaimed to give voice to an art created by anonymous, creative masses, whose aggressive gestures were in retaliation to the consumerist advertising propaganda displayed on the posters. This thesis examines both physical qualities of Villeglé's assemblages and aspects of his ideology explaining his artistic creation within the historical context of France in the 1950s and 1960s. While intellectual discourse in these decades focused on the cultural affirmation of working-class people, Villeglé's artistic action relies on his primitivist conception of the anonymous creators of his art, who are working in the "urban jungle" of a rapidly industrializing country. Villeglé's personal ideology and the intellectual discourse on popular culture that I consider assumed that those perceived to be struggling for cultural affirmation possessed a uniform identity. I analyze what these interpretations neglect to recognize, which is the importance of cultural affirmation for immigrants from the colonized nations of North and West Africa living in France. I further interpret how struggles for independence from French colonial rule were represented in popular culture of France in the 1950s and 1960s.

BIOLOGICAL CHEMISTRY

Matthew A. Dow

Advisor: T. Glen Lawson

The Development of an Inducible System for Expressing EMCV 3C Protease in Cultured Mouse Cells

The 3C protease of encephalomyocarditis virus (EMCV) is degraded *in vitro* via the ubiquitin-mediated proteolytic pathway. An inducible expression system will be necessary for the *in vivo* study of EMCV 3C protease degradation. The goal of this research was to develop such a system using the recently introduced tetracycline-regulated gene expression system. This system depends on the control elements of the tetracycline-resistance operon found in Tn10 of *Escherichia coli* to direct gene expression in eukaryotic cells. To avoid low levels of expression of the control element, tetracycline-controlled transactivator (tTA) fusion protein, the expression of tTA has been made autoregulatory. Several DNA constructs carrying EMCV 3C wild type and mutated coding sequences in the Tet-regulated plasmid pTetSplice were prepared. The transfection of cells with a plasmid carrying the luciferase gene activated by the tetracycline system and the drug marker puromycin was used to test the successful integration of the tetracycline-controlled gene expression system into the cell line. It was determined that the optimal range for selection of successfully transfected murine mammary cells (MMC127) utilizing puromycin was less than 2 $\mu\text{g/ml}$. Puromycin concentrations above 2 $\mu\text{g/ml}$

kill MMC127 cells successfully transfected with the gene for N-acetyl transferase which inactivates puromycin. Tetracycline levels above 0.25 µg/ml cause cellular death in healthy MMC127 cells. In addition, an assay for luciferase activity using a scintillation counter was developed and showed detection of protein concentrations on the picogram level. The development of this autoregulatory gene expression system in MMC127 cell lines will allow for the kinetic study of the degradation of EMCV 3C protease *in vivo*.

Jay H. Edmonds

Advisor: T. Glen Lawson

The Analysis of a Protein Destruction Signal in the Encephalomyocarditis Virus 3C Protease Using a Competition Assay

As with all picornaviruses, the encephalomyocarditis virus contains a region in its genome that codes for the 3C protease protein, an essential enzyme needed during viral replication. It has been discovered that this 3C protease is rapidly degraded during infection by a virus-independent, ATPdependent process called the ubiquitin-mediated proteolytic system. Certain regulatory proteins in several biological systems are known to be degraded via the ubiquitin pathway. The ubiquitin system is known to function by conjugating polyubiquitin molecules to target lysines on the protein substrate destined for degradation. Three enzymes are involved in the process, and it is the E3 ubiquitin protein ligase that is responsible for recognizing and binding to proteins destined for degradation. Lawson *et al.* recently discovered that the encephalomyocarditis virus 3C protease contains a ten-amino-acid region encoded in its primary amino acid sequence that acts as a signal for ubiquitin conjugation and consequential proteolysis. Further research determined that E3a is the ubiquitin protein ligase that interacts with the 3C protease. We report here further characterization of the signal and its interaction with E3a. Three mutant 3C proteases, each one containing an altered version of the signal, were made: E3CA41, E3CL34A, and E3C+A38. Mutant plasmids were constructed using PCR based site specific mutagenesis and expressed in *E. coli* BL21 cells. Effective protein purification and re-fold procedures were developed in order to isolate the mutant proteins. The mutants were added in varying concentrations with ³⁵S-labeled wild type 3C protease and incubated *in vitro* in rabbit reticulocyte lysate with added methylated ubiquitin. The generation of higher molecular weight species consistent with the molecular weight of monoubiquitinated-3C protein conjugates was observed for both E3CL34A and E3C+A38 but not for E3CA41 at higher concentrations. These results show that both E3CL34A and E3C+A38 are poor substrates for E3a recognition and binding, while E3CA41 is a slightly better substrate. The three mutants were also added in varying concentrations with ³⁵S-labeled wild type 3C protease and incubated *in vitro* in rabbit reticulocyte lysate with added ubiquitin. Both E3CL34A and E3C+A38 showed little competition in reducing the rate of labeled 3C protease degradation, while E3CA41 showed greater competition in reducing the rate of labeled 3C protease degradation. These results suggest that destruction signal acts as some type of binding determinant in the recognition and binding of E3a with EMCV 3C protease.

Rebecca A. Emmons

Advisor: T. Glen Lawson

Two Studies of Picornaviral 3C Protease Destruction: 1) Evidence for a Destruction Signal in the HAV 3C Protease and 2) A Search for Ubiquitin-3C Protease Conjugates in EMCV Infected Mouse Cells

Picornaviruses are single stranded RNA viruses that encode for a 3C protease. The 3C protease of the encephalomyocarditis virus (EMCV) and the hepatitis A virus (HAV) are both rapidly degraded *in vitro* by the ubiquitin-mediated degradation system. Ubiquitin is covalently attached to the 3C protease, which is then degraded by the 26S proteasome. Features in target proteins, such as amino acid sequences, are responsible for recognition by the ubiquitin system. A destruction box, a ten-amino-acid sequence, has been identified in the EMCV 3C protease, and one is suspected to exist in the HAV 3C protease. In order to confirm the identity of the HAV 3C protease destruction box, it was determined whether the transfer of the signal to another protein also resulted in the transfer of signal function. The signal was transferred to the normally stable poliovirus 3C protease. The region of the poliovirus 3C protease that is analogous to the suspected destruction box of the HAV 3C protease was mutated to contain the HAV 3C sequence. It was determined that the mutated poliovirus 3C protease was able to become conjugated with methylated ubiquitin and the protein was rapidly degraded in rabbit reticulocyte lysate. All characterizations of the use of ubiquitin-mediated degradation of the 3C proteases to date have been done *in vitro*. It is necessary to determine that the system is also responsible for the 3C protease degradation *in vivo*. In order to evaluate this, mouse mammary cells from a cancer line have been infected with EMCV and incubated for varying amounts of time. The 3C proteases were precipitated out of the resulting cell lysates and examined for the presence of conjugated ubiquitin.

Molly E. Sweep

Advisor: T. Glen Lawson

The Kinetic Analysis of the Conjugation of Ubiquitin to Picornavirus 3C Proteases Catalyzed by the Ubiquitin-protein Ligase E3 α

Picornaviruses such as encephalomyocarditis virus (EMCV) and hepatitis A virus (HAV), are small, single-stranded RNA viruses. Picornaviruses encode a 3C protease in their nascent polyprotein that is responsible for the obligatory protein processing necessary for mature virion release. It has previously been shown that the EMCV and HAV 3C proteases are rapidly degraded by ubiquitin-mediated proteolysis. Ubiquitin-mediated degradation occurs when ubiquitin, a small polypeptide, is attached to the target protein, and the ubiquitin-protein conjugate is then recognized and degraded by the 26S proteasome. The ubiquitin-protein ligase, E3 α , is responsible for the recognition of the 3C proteases and the subsequent conjugation of ubiquitin. It has previously been determined that EMCV 3C protease has a ten-amino-acid sequence that targets it for degradation. It has been hypothesized that the HAV 3C protease also has a region targeting it for degradation, though less effectively because the half-life for HAV 3C protease is greater than that for EMCV 3C protease. In order to compare substrates such as EMCV, HAV and mutant 3C proteases, it is important to quantify their kinetic parameters. Using *in vitro* protein reconstitution assays and kinetic analysis, the K_m for EMCV 3C protease was determined to be 21 μM , the V_{max} was determined to be 0.26 pmol/min, indicating that the V_{max}/K_m was approximately 0.01 pmol/min $\cdot\mu\text{M}$. The K_m for HAV 3C protease was shown to be 7.6 μM , the V_{max} was shown to be 0.08 pmol/min, indicating that the V_{max}/K_m was approximately 0.01 pmol/min $\cdot\mu\text{M}$. The

kinetic analysis of the wild-type EMCV and HAV 3C proteases suggested that the EMCV 3C protease destruction sequence may not be a binding determinant. In order to elucidate the role that the EMCV 3C protease destruction sequence plays in E3a's recognition, EMCV and HAV 3C protease mutants have been constructed and the kinetics of their ubiquitination analyzed.

BIOLOGY

Aaron E. Hagge-Greenberg

Advisor: Pamela J. Baker

Regulation of Interleukin 13 in the Gastrointestinal tract

Clinical discomfort and tissue damage that occur in the intestine of patients afflicted with ulcerative colitis (UC) and Crohn's Disease (CD) are mediated by the recruitment and local activation of inflammatory white blood cells. Understanding the factors that both stimulate the activation of these inflammatory cells and inhibit their response may help us design new therapeutic approaches. From an experimental point of view, investigations of humans with chronic disease have focused on pro-inflammatory agents that mediate disease; yet, limited attention has been paid to physiological substances that are capable of blocking the disease process. In this thesis I have experimentally evaluated, using molecular biology techniques (RT-PCR), whether the production of a known anti-inflammatory protein, Interleukin 13, is altered in inflamed mucosal cells. These studies will help us to determine whether Interleukin 13 plays a physiological or pharmacological role in inflammatory bowel diseases.

Sarah E. Picard

Advisor: Sharon Kinsman

Successional and Historical Patterns of Five Hardwood Forest Stands Dominated by Red Oak (*Quercus rubra*) and American Beech (*Fagus grandifolia*) in Maine

Very recently, the Maine Natural Areas Program identified oak-beech forest stands as a community type. Their determination was based on vegetation surveys conducted on public lands in Maine. The oak-beech community type is characterized by a high percentage of red oak (*Quercus rubra*) in the canopy and a high concentration of beech (*Fagus grandifolia*) in the understory. However, red oak does not typically occur as a dominant species in northern hardwood forests. Instead, beech, sugar maple (*Acer saccharum*), and yellow birch (*Betula alleghaniensis*) characteristically dominate northern hardwood forests. My main goal for this study is to further ecologists' understanding of the newly identified, and perhaps anomalous, oak-beech forest type. Specifically, my study is designed to investigate whether these oak-dominated stands indeed represent a discrete community type, or simply constitute an uncommon successional stage of northern hardwood forests. I am also investigating whether forest stands dominated by red oak and beech were present before European settlement, or whether this stand type is new, with nineteenth-century land-use practices causing red oak to become more frequent in stand development. Finally, I attempt to predict the likely futures of stands currently dominated by red oak and beech. During the summer of 1998, I investigated five oak-beech stands. I collected information on the land-use history of each to better understand how the oak-beech stands might have

established. For at least one of the five sites, written records suggest that oak was not common in the nineteenth century. In each stand, I recorded the species composition of trees, saplings, shrubs, seedlings, and herbs, and recorded the trees' size and canopy class. Tree cores allowed me to determine the age of individual trees, and thus the establishment dates of the stands. At all five sites, red oak was the most important species. Beech was the second most important species; red maple was the third most important species at almost every site. The trees' annual growth rings indicate that three of the five stands established between 1840 and 1850, while the remaining two stands established in the 1900s. Why has red oak come to dominate these sites? At all five sites, charcoal in the soil and logging evidence suggest that fire and logging might have played a role in the development of stands dominated by red oak. However, it is likely that evidence of fire and logging could be found throughout Maine. I believe that oak dominated stands are a result of human-land use, although it is uncertain exactly which land-use practices set the stage for their development. As a result, I doubt oak-beech stands were common in pre-European landscapes. The lack of seedlings, saplings, and young trees of red oak in each of these stands suggests that in the future, red oak cannot continue to dominate the canopy; rather the canopy will come to be dominated by other northern hardwood species, such as beech and sugar maple, that are now in the understory. Historical land-use information along with stand composition and structure suggest that oak-beech stands do not represent a discrete community type, but are an unusual successional stage of northern hardwood forests.

Rebecca A. Swearingen

Advisor: Joseph G. Pelliccia

Molecular and Fetal Analysis of Two Mouse Models Completely Lacking the Erythrocyte Band 3 Protein

Band 3, the anion exchanger (AE1), is the most abundant integral membrane protein found in the mammalian red blood cell (RBC). Band 3 mediates bicarbonate exchange in the RBC and serves as the major attachment site between the plasma membrane and the underlying membrane skeleton. Band 3 may also play a role in terminal erythropoiesis. Band 3 is encoded by the *Ae1* gene. Two mouse models exist for complete band 3 deficiency. One model is *wan*, a spontaneous recessive mutation that arose on the C3H/HeJ inbred strain at The Jackson Laboratory (TJL). As an academic year student at TJL I demonstrated that *wan* leads to premature termination in the band 3 protein. The other model was genetically engineered by knocking out the *Ae1* gene in 129/Sv (JI) embryonic stem cells. The targeted band 3 null model (*AE1*^{-/-}) is maintained as a heterozygote on a C57BL/6J and 129/Sv (B6, 129) hybrid background. These 2 mutations represent 2 different alleles of the *Ae1* gene.

Hematological data indicates that both mouse models are severely anemic at birth and RBC morphology is characteristic of Hereditary Spherocytosis (HS). Surprisingly, *wan/wan* newborns lack circulating reticulocytes, nucleated precursors to RBCs, indicating a failure of postnatal erythropoiesis. As a summer student at TJL I outlined and extended the research to the fetal stages of development of these two mouse models to discern the time of onset of the erythropoietic failure. Dramatically decreased RBC counts in both mouse models indicated that fetuses were anemic in utero. No reticulocytes were seen after embryonic day 15 in both mouse models. This condition was unforeseen in the *AE1*^{-/-} mice since a dramatically increased reticulocyte percentage was observed in the N1F1 generation of homozygous *AE1* newborns. This led to the reexamination of the *AE1*^{-/-} newborns now at the N7 generation. Surprisingly, a significant portion of these mice lacked reticulocytosis. Approximately 85% of *AE1*^{-/-} mice survive for no more than 4 days postnatally. A subpopulation of *AE1*^{-/-} mice (~15%) show markedly increased reticulocytosis and survive to adulthood. This heterogeneity in survival rates among

the band 3 null mice and phenotypic similarity to wan is particularly intriguing. In this paper I aim to (1) describe my studies leading to the discovery of the mutation in wan mice and the major hematological findings associated with this mutation (2) report the fetal analyses of both mouse models (3) compare and contrast the two mutations (4) develop an hypothesis concerning the function of band 3 in the RBC and ultimately the role of the Ae1 gene in erythropoiesis (5) outline the next stage in the research for these two important murine hematological models.

CHEMISTRY

Christopher R. Colapietro

Advisor: Rachel N. Austin

Determining the Structure of a Heterogeneous Catalyst

Scientists have grown interested in developing new catalysts as demands for industrial processes that are more efficient and generate less waste increases. The discovery of MCM-41, a novel aluminosilicate, in 1992 opened the way for a new class of solid catalysts. This new class of catalysts consists of putting an established catalyst, normally active when dissolved, into a solid support. The solid catalysts can be used to catalyze solution phase reactions, often stabilizing the catalysts, and promoting efficient catalyst recovery. The goal of my research will explore the structure of a heterogeneous catalytic system, synthesized at Bates, that is comprised of iron porphyrins and MCM-41. This goal will be obtained by synthesizing the complex and then using a variety of structural techniques including transmission and scanning electron microscopy, nitrogen adsorption/desorption, x-ray diffraction, ultra-violet visible, diffuse reflectance, and inductively coupled plasma atomic emission spectroscopies. In addition to these techniques, catalytic data will be used to elucidate the structure of these materials. Finally, this research paper will include a complete literature critique of all twentyeight articles that have been published claiming to have made heterogeneous catalysts with MCM41.

Melissa S. Vining

Advisor: Thomas J. Wenzel

Lanthanide-Crown Ether Complexes as Chiral NMR Shift Reagents

Crown ethers have previously been studied as chiral resolving agents in ^1H NMR spectroscopy for ammonium salts of amino acids, amino alcohols, and amino esters. In many cases, the chiral resolution caused in the NMR spectrum is small or non-existent. Lanthanide ions can be coupled to crown ether systems to enhance chiral resolution. Coupling can be achieved by mixing suitable lanthanide complexes with mixtures of the crown ethers and substrates. Alternatively, the lanthanide can be bound to the crown ether. Three bi-functional chiral crown ethers with lanthanide binding groups have been examined. The synthesis of two of these crowns is discussed. The third is commercially available. The utility of the latter in conjunction with lanthanide ions as a chiral NMR resolving agent is described.

CLASSICAL & ROMANCE LANGUAGES & LITERATURES

FRENCH

Olga Demin

Advisor: Kirk D. Read

Déflorées par le monde: L'adolescence dans une famille incomplète et les influences culturelles dans *Bonjour tristesse* et *L'amant*

This thesis is an analytical comparison of two novels, *Bonjour Tristesse* by Françoise Sagan and *The Lover* by Marguerite Duras. The central theme of both works is a process of emotional, social, and sexual maturation of an adolescent girl who had grown up in a single-parent family without an appropriate amount of attention and guidance, and who, although cynical and jaded before her time about certain aspects of life, is at the same time naive and surprisingly immature in many matters regarding human interactions. Although the individual circumstances of the main characters of the two novels differ significantly, there are striking parallels in their ways of developing a sense of identity and dealing with the outside world. The analysis draws heavily on Freud's theory of psychosocial development as well as on various feminist identity theories. It also examines cultural context as an important factor in personality formation.

Elizabeth L. Feldman

Advisor: Richard C. Williamson

L'Éruption de l'Antisémitisme: Edouard Drumont et *La France Juive* Une Thèse d'Honneur

Important in modern French history is the Dreyfus Affair, a blatant discriminatory act, beginning in the 1890's, that divided the nation. In the late nineteenth century, prejudice against Jews broadened from simple hatred for religious differences into an antisemitic movement based on economics, race, and religion. Not only did economic, political, and social insecurities lead the nation to search for a scapegoat, but an increased literacy rate allowed authors like Edouard Drumont to hand the public a reason for their sufferings. By discussing the particular influence of Edouard Drumont in the antisemitic movement just prior to the Dreyfus Affair, I give an explanation for the blatant prejudice against the Jews in France. An analysis of *La France juive*, Drumont's most popular book, enlightens us all to the atmosphere "à la fin du siècle" and explains how one could assume that any Jew was a spy and a traitor.

SPANISH

Jill H. Firestone

Advisor: Claudia A. Guzman

Caught on the Margin: La política de representación de los cubanos-americanos en tres obras literarias

In this investigation of the Cuban exiles, I plan to demonstrate the dissimilarities between three notable migratory waves of these individuals during the years of 1959 and 1980. Specifically, these differences are directly related to socio-economic class, political orientation, religious affiliation and generational trends. In addition, we see various distinctions in terms of assimilation and identity construction between these groups of exiles. These details of contrast undoubtedly serve a significant function in that they reveal the fact that the exile experience varies from one migratory group to the next. In a preponderance of literary works written by Cuban-Americans in the United States, we see many references to the historical background and theoretical trends that I study in my work. Similar to these two points of reference, the texts also enable us to see that the exile process is not a concrete entity, but a plethora of experiences that are unique and ever-changing. My position that all Cubans cannot be conglomerated into a collective group as a result of their distinctive backgrounds will be supported through the analysis of Roberto G. Fernández' *Raining Backwards*, Cristina García's *Dreaming in Cuban* and Dolores Prida's *Beautiful Señoritas and Other Plays*.

Samara L. Golden*

Advisor: Francisca López

Borges and the Individual

In his narrative prose, Jorge Luis Borges primarily concerns himself with the complex relationship between reality and fantasy. According to Borges, each individual is surrounded by what he terms a labyrinth, a metaphor for the social constructs responsible for determining the way in which each individual perceives reality. This thesis is concerned with determining how this perceived reality affects the notion of individuality in the text, and whether or not the individual can truly exist autonomously, devoid of his or her labyrinth, in Borges's texts. In order to determine this, the thesis is divided into two sections. The first two chapters, written in Spanish, uses three of Borges's short stories, "The Secret Miracle," "The South" and "The Other Death" to illustrate how Borges uses his characters to question the social constructs of our society. The second section of the thesis, written in English, compares Borges's stories to the stories of two of his American influences, H.G. Wells and Hawthorne. In comparing Borges's work to that of these two authors, it is possible to determine not only how Borges questions reality, but how these ideas relate to the English influences that affected his writing.

Tracy F. Rubovits

Advisor: Baltasar Fra-Moliner

El camino político hacia la integración europea: Desde el franquismo hasta el presente

From the start of General Francisco Franco's forty-year dictatorship in 1939 to the democracy initiated almost immediately after his death in 1975 and which is still in place today, there has been a radical shift in all aspects of Spain's society. Nothing highlights these events more, however, than Spain's relations with the European Community (EC). The EC has always stood as a symbol of democracy and economic prosperity. After the initial rejections due to its undemocratic past, Spain was finally admitted in 1986 to the EC. That event officially ended Spain's isolation from the rest of Europe.

This study will describe the famous "Spanish transition to the democracy" and Spain's relations with the EC. First, it will address how the decisions made during Franco's rule isolated Spain from the rest of Europe. Second, it will explain how, after Franco's death, the political parties assumed responsibility for building relations with the EC. And finally, it will trace the parties' participation in the European Union itself. The study provides understanding of a unique aspect of Spanish politics: its completely pro-European attitude.

Maeve M. Ryan

Advisor: Luz M. Umpierre-Herrera

Advisor: Patricia C. Fagan-DiStasio

El adolescente violento en la literatura española contemporánea

My thesis investigates the portrayal of violence among male adolescents. I examine both the biological and psychological aspects of violence as well as the stereotypes of the "violent man." In addition, my study researches the change in the style of literature after the fall of Franco's dictatorship in Spain. It attempts to draw a correlation between the sentiments of the Spaniards during this time with the confusion, anger, and fear that is demonstrated by the protagonists in the contemporary novels under study. I show in each of the novels the roles that family and society have and how these elements affect violent male adolescents.

ECONOMICS**Elena H. Atanassova**

Advisor: David A. Aschauer

Welfare Costs of the Bulgarian Hyperinflation

My thesis investigates the welfare costs of high inflation in Bulgaria. There are two major costs of Bulgarian high inflation—decrease in purchasing power of the population and substitution of labor from goods-producing firms into home farm-production. I am constructing a general-equilibrium model of the economy using a "cash-in-advance" constraint in order to measure these welfare costs of inflation. My thesis includes a survey of the literature on the subject, building of general equilibrium model of the economy, and empirical analysis of the welfare costs and of the performance of my model.

Abbey E. DeRocker

Advisor: Margaret A. Maurer-Fazio

Energy Consumption, Sustainable Development, and the Kyoto Protocol: A Diffusion of the Possibility for a Clean Development Mechanism Project in the Energy Sectors of the United States and China

Politicians, scientists, and academics are concerned with global warming and climate change. Carbon dioxide (CO₂) emissions from industrial boilers and coal-fired power plants are among the major anthropogenic sources that contribute to potential climate change. In 1997, 159 nations met in Kyoto, Japan to forge an international agreement targeting global warming by limiting emissions of greenhouse gases. The Kyoto Protocol specifies legally binding greenhouse gas reductions for industrialized countries, but not for developing countries. Coal-burning power plants, industrial boilers and furnaces in the United States and the People's Republic of China serve as the case study for this research paper. The United States signed the Kyoto agreement on November 12, 1998 and agreed to a seven percent reduction of greenhouse gas emissions from 1990 levels. China faces important economic development and environmental challenges due to its rapidly growing economy and disproportionate dependence on low-quality coal for energy and growth. This study explores the greenhouse gas reduction options introduced by the Kyoto Protocol in the context of United States-China cooperation. These options include: 1) the creation of an International Emissions Trading Program for carbon dioxide; and 2) the implementation of the Clean Development Mechanism (CDM), which would allow the United States to use certified emissions reductions from joint-project activities based in China to contribute to the US compliance of the Kyoto Protocol. This thesis also discusses potential difficulties in reaching international environmental agreements, concerning enforcement capabilities, global participation, national sovereignty, and international technology transfers.

Alison J. Glusman

Advisor: David A. Aschauer

The Myth of Mass Migration: Assessing Polish Potential Migration as an Aid for Immigration Policy Creation in the European Union

This project determines the potential migration from Poland to the European Union (EU) using a simple econometric migration model. It examines the effects of relative per capita GDP and stocks of Polish immigrants already living in the EU on migration. Officials and policy makers in the EU fear the threat of mass migration from Eastern Europe. Because Poland is so large and so close to the EU, it poses the biggest perceived threat to the EU in the sense that mass migration could depress wages, cause social friction, or increase unemployment. Poland is one of the forerunner countries of Eastern Europe that wishes to become a member of the EU, so it is especially relevant to concentrate on potential migration from Poland. Without good estimates of potential migration, it is difficult to determine whether a union wide immigration policy is necessary and if so, what kind of policy will allow an amount of migration that is helpful to the EU's economy. Suggestions concerning the possible uses of the findings from the econometric analysis in regard to forming an effective immigration policy are also made.

ENGLISH

Megan E. Dyer

Advisor: Carole A. Taylor

Reading, Writing and the Controversial Text: Views of the Social Context in Alice Walker's *The Color Purple* and Carolyn Chute's *The Beans of Egypt, Maine*.

This work serves as an investigation into the various critical responses to two controversial pieces of contemporary American literature, *The Color Purple* and *The Beans of Egypt, Maine*. Through close analysis of both the primary texts and critical responses to them, a reading is suggested that responds to common criticisms. The focus of this inquiry is how the fictional worlds within the texts are related to the social positioning of writers and readers. Walker's extensive writings on the experience of authoring *The Color Purple* and the public's reaction to it give new insight into the idea of authorial intent. Chute's response, in the form of an explanation and revision of *The Beans of Egypt, Maine* ten years after the original publication, offers an authorial response to misreadings. Walker's and Chute's responses to both the literary and personal criticism provoked by their novels offer a new dimension to thinking about interrelations among texts, readers and authors.

Samara L. Golden*

Advisor: Cristina Malcolmson

Borges and the Individual

In his narrative prose, Jorge Luis Borges primarily concerns himself with the complex relationship between reality and fantasy. According to Borges, each individual is surrounded by what he terms a labyrinth, a metaphor for the social constructs responsible for determining the way in which each individual perceives reality. This thesis is concerned with determining how this perceived reality affects the notion of individuality in the text, and whether or not the individual can truly exist autonomously, devoid of his or her labyrinth, in Borges's texts. In order to determine this, the thesis is divided into two sections. The first two chapters, written in Spanish, uses three of Borges's short stories, "The Secret Miracle," "The South" and "The Other Death" to illustrate how Borges uses his characters to question the social constructs of our society. The second section of the thesis, written in English, compares Borges's stories to the stories of two of his American influences, H.G. Wells and Hawthorne. In comparing Borges's work to that of these two authors, it is possible to determine not only how Borges questions reality, but how these ideas relate to the English influences that affected his writing.

Shannon D. Hurst

Advisor: Steven C. Dillon

Presence Glimpsed: Doors and Thresholds in the Poetry of Emily Dickinson

In this thesis I will explore how Emily Dickinson works images and metaphors of doors and thresholds into her poetry. Specifically, I will seek to give readers a fuller understanding of Dickinson's perception of the door between herself and God. Through a formalist analysis of Dickinson's poems, I

will show that her speaker often finds herself unable to cross a threshold towards God. But even in these times of frustration, she glimpses enough of Presence to encourage her to keep looking for God's door. The three chapters of this thesis will be divided thematically. In the first chapter, I will discuss how Dickinson observes that opening the door to the world of nature allows her to approach God indirectly. "The earth has many keys" – sometimes these keys open unknown doors. My second chapter will focus on being humble before God's threshold. Poems such as "Eden is that old-fashioned House" reveal that "sauntering" away from God leads to more pain than running from Him. Running away may indicate the healthy fear which forms the subject of my final chapter. "I Years had been from Home" and other poems reveal that Dickinson does not have to abandon fear at a threshold moment before God. But she does have to develop a fear that comes not from dread but from awe. To add to my analyses of Dickinson's poems, I will refer especially to Dickinson's letters edited by Thomas H. Johnson, to Noah Webster's 1828 *American Dictionary of the English Language*, and to the King James Bible.

Mark L. Jensen

Advisor: Sanford A. Freedman

To Retreat Inside the Whale? Orwellian Reformulations of Political Theory

Orwell's enlightening disappointment in the Spanish Civil War as documented in *Homage to Catalonia* constituted the turning point in his ideological views, after which he, criticizing the system he had formerly believed in, regarded international Socialism as imperialistic and fiercely hypocritical. However, the basis of this criticism remained rooted in Marxist thought, as Orwell explored ideas of class consciousness and a superstructure of experience as fundamental to ideology. These ideas translate into terms of fiction exploring the function and flexibility of political theory in *Animal Farm* and *1984*. Both of these works exhibit an unmistakable connection with factual historical terms which many critics read as direct political commentary focusing on representations of Socialism. The thesis, however, maintains that the fictional form disrupts these correlations, creating ambiguities that critique political orthodoxy rather than suggesting alternatives. In part this stems from Orwell's personal insecurities and search for meaning in a world whose ideological truths had been fractured by power politics, such that his earlier suggestion to get "inside the whale" (1940) and retreat from politics resurfaces in *1984*, indicating possibilities of an apolitical existence in a world dominated by politics. Orwell's personal experiences in *Homage to Catalonia* therefore have relevance to his later works as a source for the meaning of politics in the interaction of individual experience and ideological theory.

Beth L. Kalinowski*

Advisor: Lillian R. Nayder

The Culture of Cookbooks: Reflections of Class and Gender in Victorian England

My thesis deals with two of the main functions of cookbooks outside of their initial duty of instruction--their ability to entertain as a form of literature, and their ability to critique the society in which they were written. Cookery books of the nineteenth century respond to the changing perceptions of gender and class norms, reflecting these changes by both challenging and confirming societal boundaries. While looking at the consumption patterns of men and women of the middle and working classes through primary sources and literature of the nineteenth century, I also analyze the use of cookery books and domestic management manuals by these groups. Some of the primary sources that

I discuss in my thesis are *A Shilling Cookery for the People*, *The Women of England*, *Mrs. Beeton's Book of Household Management*, *Cookery and Housekeeping: A Manual of Domestic Economy for Large and Small Families*, and *What Shall We Have for Dinner?* Along with this assortment of cookery and domestic management books, I also look at the literary works of Charles Dickens, Wilkie Collins, Charlotte Brontë, Jane Austen, and George Eliot.

Jessica K. Lane

Advisor: Lavina D. Shankar

Defying Polarity: Challenges to a Unified I/Eye in Trinh T. Minh-ha's *A Tale of Love* and Maxine Hong Kingston's *The Woman Warrior*

In their works *The Woman Warrior* and *A Tale of Love*, Maxine Hong Kingston and Trinh T. Minh-ha authorize female voice and experiences, and challenge mainstream American literary and cinematic canons. Rather than juxtaposing polar opposites like author/self and myth/reality, Kingston blurs these boundaries for a more complicated exploration of her Chinese American identity. Trinh breaks down the traditional barriers and power dynamics between the viewer and the film such as the subject/object continuum, visual/sensory perceptions, matrilineal/patriarchal history, and the female image/voice. Classified as "other" by binary oppositions of sex and ethnicity in the United States, both Trinh and Kingston subvert these limitations by questioning the "self" of the textual and cinematic subject. Complicating the relationship between author and text, I interrogate my own position as a white feminist reader, viewer, writer, and critic of non-western women's work.

Amanda M. Prendergast

Advisor: Carole A. Taylor

Seeing Through a Glass Darkly: Narrative and Postmodern Modes of Telling in Umberto Eco's *The Name of the Rose* and *The Island of the Day Before*

Renowned for his works in semiotics and his intricately constructed fiction, Umberto Eco uses medieval and renaissance settings through which to interrogate the postmodern condition. Through complex self-reference to such contemporary genres as the historical novel, detective fiction, mystery, and satire, Eco engages readers in questioning their own assumptions and resolutions. His novels *The Name of the Rose* and *The Island of the Day Before* reconstruct a past using self-referential modes in which narrative strategies invite the reader's judgements and then undermine the basis for those judgements. The thesis frames how these complex modes of self-reference structure fictional worlds, worlds that negotiate the relevance of historical periods and genres to the problematics of the late twentieth-century life.

Rebecca J. Skarbek

Advisor: Lillian R. Nayder

Authority and Gender in George Eliot's *Middlemarch*

Focusing on the Victorian novelist George Eliot (Marian Evans), this thesis analyzes her treatment of gender and authority in what is considered her "major" text, *Middlemarch*. My thesis situates Eliot and her work in historical context, exploring the position of women, specifically women writers, within the social structure of Victorian England. Within this context, I discuss Eliot's life and the struggles of identity and agency she encountered as she began to write for publication, culminating in her decision to adopt a male pseudonym and her entry into mainstream fiction. The text of *Middlemarch* serves as a tool by which I analyze the literary strategies employed by Eliot, in an effort to subvert the stereotypical social views of Victorian normative femininity, as well as question the position of men as figures of authority in both the social and literary realm.

GEOLOGY

Peter C. Beeson

Advisor: Lois K. Ongley

Applied Groundwater Modeling: A Local Flow Simulation of the Urban Zone, Zimapán, Mexico

The residents of Zimapán, Mexico have been exposed to adverse health effects of chronic arsenic poisoning attributed to contamination of their drinking water. This small rural town, located about 200 km. north of Mexico City, has been a lead-silver-zinc mining district since the late fifteenth century. The arsenic sources are believed to be released into the drinking water by anthropogenic processes linked to mining and by natural weathering of bedrock that contains arsenic bearing minerals. This thesis developed a modular three-dimensional finite difference groundwater flow model using Visual MODFLOW 2.7.2 to simulate the groundwater flow in the most densely settled area in the Zimapán Valley. By understanding the water flow patterns, I can predict where uncontaminated water might be located. This thesis was part of a Research Experience for Undergraduates (REU) funded by the National Science Foundation with additional funding through the Hoffman-Mellon Fund and the Bates Student Research Fund.

Paige L. Heller*

Advisor: Gene A. Clough

A Geophysical Gravity Survey in Search of Aquifer Potential, Eldorado, New Mexico

The town of Eldorado, New Mexico, about 10 miles southeast of Santa Fe, is growth-restricted due to an insufficient water supply. Exploration drilling reveals a complex subsurface geology. These limited data cannot accurately represent the subsurface groundwater potential of the area. This study uses a detailed gravity survey to model the thickness, distribution and structural characteristics of rock units that may contribute to groundwater transport. Comparison of the data with other geophysical work in

the area helps to constrain a three-dimensional model of the subsurface geology. Eldorado sits in a small structural basin, the Santa Fe Embayment, which is an intra-rift feature of the Rio Grande Rift. It is filled with thick layers of the Tertiary-Quaternary sediments that are the primary water source for the greater Santa Fe area. At its present size of nearly one thousand families, Eldorado experiences water shortages during dry periods. A data set of over 2,000 gravity stations across a 30x30minute quad was compiled to develop two- and three-dimensional models of the residual gravity anomalies that represent the subsurface geology, rock units and associated structures. Correlation with models derived from seismic and magnetic data reveals a deep, enclosed basin containing up to 10,000 feet of Tertiary sediments. While the data do not at this time delineate untapped groundwater aquifers, they provide information that will affect future drilling and water exploration in the Eldorado area.

Bradford S. Morse

Advisor: Lois K. Ongley

A Regional Finite-Difference Groundwater Flow Model for an Arsenic Contaminated Valley, Zimapán, Hidalgo, Mexico

Previous studies have found concentrations of arsenic in the groundwater of the Zimapán Valley, Hidalgo, Mexico above 0.050 mg/L (the former WHO drinking water standard) in municipal wells, domestic wells, and springs. Sources of arsenic are both natural (desorption from arsenic-bearing minerals in the bedrock) and anthropogenic (leaching from ore process waste piles). This study used the U.S. Geological Survey's modular, finite-difference, three-dimensional groundwater flow model, MODFLOW, operating under the Department of Defense's pre- and post-processor, Groundwater Modeling Systems. The objectives of constructing the groundwater flow model are: 1) to gain an understanding of the regional groundwater flow patterns of the Zimapán Valley; 2) to relate the groundwater flow patterns to the arsenic contamination problem; 3) to test the effects pumping hypothetical municipal wells; and 4) to propose a range of values for hydraulic conductivity and a volumetric water budget for the Zimapán Valley.

Katherine B. Osborne

Advisor: Lois K. Ongley

Advisor: John Creasy

Petrology of the Las Espinas Formation, Cerro Grande, Zimapán, Mexico

Cerro Grande is located in the eastern Zimapán Valley, Hidalgo state, Mexico, approximately twohundred kilometers north of Mexico City. The hill is comprised of the Las Espinas Formation, which is Late Oligocene to Miocene in age and is characterized by a sequence of volcanic flows. Whole rock geochemical analyses showed differences in rock composition with elevation, indicative of changing magma composition over time. Thin section analysis was also done and determined that physical differences correspond to geochemical differences. This is part of a continuing NSF-Research Experience for Undergraduates program that examines arsenic contamination in the Zimapán municipal water supply, and possible regional contributing factors to this problem.

GERMAN, RUSSIAN & EAST ASIAN LANGUAGES & LITERATURES

GERMAN

Roxanne Gillespie

Advisor: Craig J. Decker

Peter Handke und die Brechtsche Theater theorie: Kritik einer Kritik

Bertolt Brecht (1898-1956) is most known for his contribution to theater through his development of “epic theater” and his creation of what is known as the “*Verfremdungseffekt*” (V-effekt), or “alienation effect.” The notion behind epic theater is that through non-dramatized plays spectators are made to reflect on social injustices. Brecht took epic theater one step further by introducing the Veffekt. He contended that in order for the spectator to be truly able to reflect upon the ills of society, he or she must be “alienated” or distanced from the play. Holding fast to a socialist political agenda, Brecht wanted to have a positive and substantial effect on mankind. Furthermore, he wanted the public to recognize its own responsibility in the transformation of society. While praised for his commitment to social change, Brecht has also faced strong criticism. The Austrian writer Peter Handke (born in 1942) has been perhaps one of Brecht’s harshest critics. Handke claims that Brecht’s V-effekt is not truly effective in bringing about any substantial social change because it is inherently flawed in theory. A member of the rebellious generation that followed Brecht’s, Handke maintains that the V-effekt is unproductive because after the spectator experiences the effect once, or has been informed of its intent, the spectator then approaches Brecht’s plays with the expectation of unfamiliarity. Thus, the spectator learns to detect the method by which Brecht crafts the plot, thereby subverting the intent of the Veffekt. My thesis explores the literary views and textual methods of both Brecht and Handke, focusing on Brecht’s development of epic theater, Handke’s critique of it, as well as Handke’s specific use of the V-effekt in his own literature.

RUSSIAN

Adelia B. Myrick

Advisor: Jane T. Costlow

Akhmatova’s Russia: A Natural World in an Unnatural Time

My thesis considers selected works of Anna Andreevna Akhmatova, a Russian twentieth-century poet. Akhmatova’s deep connection with her natural world and her movement towards becoming a voice for her people are the two major threads that I follow throughout her work. In chapter one I examine poems from Akhmatova’s third book of poetry, *White Flock*, published in 1917, and develop a picture of her growth from naive childhood to a more worldly adulthood. Of particular importance in this chapter is Akhmatova’s rejection of nature as explicit material for her poems on the grounds that, although beautiful, it is too simple. Intertwined with this is Akhmatova’s developing relationship with her muse and her personal understanding of God, all of which combine to create a path leading up to her adult poetry. Chapter two, which considers poems from *Anno Domini* (published in 1922), reestablishes the importance of nature to Akhmatova. She realizes, through renewed personal

connection, that her natural world specifically represents Russia. She comes to express an age-old love for “Mother Russia” as a benevolent, compassionate entity, and this affinity for her earth becomes inseparable from her bond with her people. Through nature, Akhmatova grows into a soulful spokesperson for them, even in the midst of the unnatural world of repression and suffering that went along with the experiment in communism. Chapter three focuses on her later poems, “Way of all the earth”, “Northern Elegies”, and parts of “Requiem,” following Akhmatova’s voice through time in order to complete the story of her alliance with her natural world and her evolving role as voice for her people.

HISTORY

Beth L. Kalinowski*

Advisor: Lillian R. Nayder

The Culture of Cookbooks: Reflections of Class and Gender in Victorian England

My thesis deals with two of the main functions of cookbooks outside of their initial duty of instruction--their ability to entertain as a form of literature, and their ability to critique the society in which they were written. Cookery books of the nineteenth century respond to the changing perceptions of gender and class norms, reflecting these changes by both challenging and confirming societal boundaries. While looking at the consumption patterns of men and women of the middle and working classes through primary sources and literature of the nineteenth century, I also analyze the use of cookery books and domestic management manuals by these groups. Some of the primary sources that I discuss in my thesis are *A Shilling Cookery for the People*, *The Women of England*, *Mrs. Beeton's Book of Household Management*, *Cookery and Housekeeping: A Manual of Domestic Economy for Large and Small Families*, and *What Shall We Have for Dinner?* Along with this assortment of cookery and domestic management books, I also look at the literary works of Charles Dickens, Wilkie Collins, Charlotte Brontë, Jane Austen, and George Eliot.

INTERDISCIPLINARY STUDIES

Elizabeth A. Blevins

Advisor: William S. Corlett

Power Unbound: Critical Reflections On Gender And Domestic Violence

The process of understanding the complex system of patriarchy has often led feminists to conceive of power through two opposing categories. One views power as domination, which is used as a mechanism for subordinating women and rendering them powerless. The other views power as capability and transformation, which considers women agents of power. Although these valuable critiques illuminate the mechanisms of patriarchy, they rely on constructions of masculinity and femininity when defining power. I am interested in whether this reliance binds women and men to thinking about power in unduly restrictive ways, ways that mask differences among women and lock men out of the struggle against patriarchy. As Joan Scott has warned, “by insisting on fixed differences. . . feminists contribute to the kind of thinking they want to oppose.” I examine the extent to which these two theoretical

categories operate in the feminist literature on domestic violence. I also explore alternative ways of considering power that do not rely entirely on constructed understandings of masculinity as domination and femininity as empowerment. Doing so may help suggest new approaches to the problem of domestic violence.

Alexis K. Gargagliano

Advisor: Arlene E. MacLeod

Weaving Words into Power: Political Voice in the Poetry of Gwendolyn Brooks, Sonia Sanchez, and Ursula Rucker

We take our actions from our fictions. Poetry writing and reading is a creative act; it is an act of transformation. Poetry has a long history of political voice. But this voice seems to have been lost in the more modern Western poetic aesthetic which has risen out of the romantics. Cultures all over the rest of world respect poetry as the powerful socio-political tool that it is. Poetry has the power of possibility. This thesis is a study of how and why three black women poets, Gwendolyn Brooks, Sonia Sanchez, and Ursula Rucker, use their poetry as a political forum. In examining their work I am looking at the cultural atmosphere and artistic ancestry out of which these women's words of vision and empowerment have risen. By looking at the powerful ways in which these women use their poetry, I hope to bring light to the potential power of poetry, and in so doing, offer an alternative way of self and social expression that can, and should, be incorporated into our daily way of being. The thesis includes a chapter of my own poetry, and an assertion of the ways in which we must actively involve poetry in our lives.

Rebecca J. Gasior

Advisor: Emily W. Kane

Deconstructing "Children At Risk": A Content Analysis

"At risk children" is a contemporary buzzword. The questions, who are *"at risk"* children and what are they *"at risk"* for, have far-reaching implications and beg a closer, more thoughtful look. Critical response to the indiscriminate, popular use and the complex meanings and interpretations of this highly elastic label has been limited. This thesis project explores the *"at risk"* label and its underlying discourse in an attempt to both problematize and deconstruct its use, meaning, and significance in society. Included is a historical glimpse of the use of risk discourse throughout the past two hundred years and an etiology of the *"at risk"* label as borrowed from epidemiological and public health (i.e., medicalized) models of risk. Risk discourse reframes and reiterates the jargon common to the "disadvantaged youth" and "cultural deficit" models of families and communities that became prevalent during the 1960s' "war on poverty". Overall, the rhetoric of *"children at risk"* problematically localizes pathologies within children and families and renders invisible the inequalities and injustices sustained and institutionalized by dominant society. Drawing on critical analyses of risk discourse, this thesis explores the micro-dynamics of how the *"at risk"* label is employed. A quantitative and qualitative analysis of a pediatric occupational therapy textbook, emphasizing psychosocial theory and practice, was performed. The content analysis explored if, and how, the field of occupational therapy, through the medium of a popular textbook, utilized the language of risk rhetoric. Occupational therapy was chosen as the focus because of the holistic and inclusive tenets upon which the field rests and the unique potential therapists have, working in varied settings, to interact with both children and families.

Overall, it is my hope, through this project, to raise awareness about the implications of the practice of labeling and the covert meanings labels such as "*at risk*" hold.

Alison M. Mann

Advisor: Erica Rand

Picturing Welfare; Representation and Welfare's Deform

The Personal Responsibility and Work Reconciliation Act of 1996 effectively cut cash assistance to millions of the nation's poorest women and children, abolished many types of aid to legal immigrants, while simultaneously allocating \$50 million for abstinence education. This conservative victory on welfare reform, it has been said, was a result of a difference in battle tactics. Conservatives told stories, while liberals quoted statistics. This study evaluates that thesis, through an analysis of those representations of welfare recipients written into the Personal Responsibility and Work Reconciliation Act of 1996 and used by politicians to rally support for it. Further, it examines the extent to which the mass media challenged or reinforced these images through its own biographical accounts and visual illustrations of recipients. Finally the study turns its focus to the representational activities of those groups of welfare activists organized against reform, including demonstrations, publications, media events, etc. It evaluates which of these counter-strategies have been most effective in subverting the government and media-authored myths that have so far set the terms of this debate.

Bethany J. Sallinen

Advisor: Cheryl M. McCormick

Androgens Affect Corticosterone Release in Response to Stress in the Medical Preoptic Area (MPOA)

The hypothalamic-pituitary-adrenal (HPA) axis is one of the main systems involved in an organism's response to stress. Sex hormones influence many levels of the HPA axis. Estrogens tend to have excitatory effects on HPA function and androgens tend to have inhibitory effects (Viau & Meaney, 1991; Handa et al., 1994). Viau and Meaney (1996) determined the medial preoptic area (MPOA) of the brain to be a site of action for the effects of testosterone. Testosterone can be converted in the presence of aromatase to estradiol (Roselli, 1985). The present study investigates whether testosterone exerts its effects on the MPOA via androgen and/or estrogen receptors. Cannulae were implanted into the MPOA of gonadectomized male rats, and filled with either testosterone propionate (TP), the non-aromatizable androgen dihydrotestosterone (DHT), estradiol benzoate (EB), or control cannulae (CTL). One week following surgery, rats were stressed for twenty minutes in a plexiglas restrainer. Trunk blood was collected to measure plasma corticosterone (CORT) as an indication of stress responsiveness. Histological analysis and levels of plasma luteinizing hormone levels were used to verify cannulae placement. Initial results indicate a greater inhibition of corticosterone release in DHT-treated animals than in other animals, suggesting that androgen receptors in the MPOA mediate the inhibitory effects of sex hormones on the HPA axis.

MATHEMATICS

Ane M. Coughlin

Advisor: Bonnie J. Shulman

Patterns in the Sand: A Mathematical Exploration of Chladni Patterns

Why is it that when a metallic plate, covered with a fine powder, is vibrated at certain frequencies beautiful patterns form in the powder? What can we learn from these wonderful “Chladni Patterns”? These questions have intrigued some of the greatest mathematicians, physicists and even national leaders: Galileo, Laplace, Legendre, Poisson, Gauss, Chladni, Germain and Napoleon. Chladni Patterns are formed when sand settles in the nodes of two dimensional standing waves, excited on a metallic plate by driving it at a resonant frequency. In my thesis I begin with a study of the one-dimensional wave equation for a string fixed at both ends. By comparing the placement of the nodes along strings of constant and variable densities, I am able to draw conclusions about the connection between density and nodal position. Then considering a two-dimensional rectangular membrane with fixed boundary and constant density, as an idealized model of the metal plate, I derive a formula for predicting the Chladni Patterns that will form at certain frequencies. In addition to mathematically exploring these mysterious patterns, I have created my own Chladni Patterns in the lab.

John T. Cullinan*

Advisor: John Rhodes

Lie Theory and Quantum Mechanics

To understand spin-angular momentum in quantum mechanics, we use a Lie-theoretic approach. The theory of one-parameter groups is developed to introduce the exponential map—the natural map from a Lie algebra to its associated Lie group. The Lie group of primary interest in this thesis is the Lorentz group of spacetime symmetries, since it contains a subgroup that is used to study spin-angular momentum. However, we study the special linear group since it is the universal cover of the Lorentz group and thus has a more manageable topology. We then categorize irreducible representations of both the special linear group and its Lie algebra and apply this to the theory of the spin-angular momentum of elementary particles.

Adnan Yousuf*

Advisor: John A. Rhodes

Pattern Dynamics in a Unidirectional Photorefractive Ring Resonator

A unidirectional resonator driven by photorefractive crystals show chaotic and unsteady field dynamics. This is a numerical study of the behavior of such a resonator. It has been shown that under the paraxial wave approximation, a set of coupled partial differential equations can be derived from the complete Maxwell’s equations for the optical field. A truncated series of Gauss-Laguerre basis functions are used to approximate solutions to these PDEs. Different numerical analysis techniques are explored in MATLAB to determine efficient ways of solving this problem.

MUSIC

Elaine K. Chow

Advisor: Suzanne G. Cusick

La Poésie Symboliste en Chanson: Verlaine, Debussy et Fauré

The centerpiece of my thesis is a recital of late nineteenth and early twentieth century *mélodies*, which are musical settings of Symbolist poetry. I am focusing particularly on pieces by Gabriel Fauré (1845-1924) and Claude Debussy (1862-1918) that are based upon works of poet Paul Verlaine (1844-1896). This program invites both me and my audience to compare these composers' contrasted responses to identical texts, looking especially to how each one addresses the challenge of composing music for poetry that explicitly aspires to the condition of music. I am also writing an essay which will further articulate these composers' musical interpretations of the texts, centering around "*En Sourdine*" of Verlaine's second collection, entitled *Fêtes Galantes*. I will debate whether or not Fauré and Debussy remained within the boundaries of what Verlaine would have wanted from their music. Considering its loyalty or lack thereof, to Symbolist goals, I will also discuss the effects of the music on myself, the performer, as well as on the audience.

PHILOSOPHY

Keith R. Gauger

Advisor: Sarah O. Conly

R.M Hare's Theory of Moral Thinking: The Problem of Preference Comparability

R.M. Hare is most noted for his pragmatic stance that moral theories should accommodate human psychology. Within his moral theory, this view is best reflected in his distinction between, as he calls them, the intuitive and critical levels of moral thinking. The intuitive level of moral thinking is used because, as human beings with limited rational capacities, we simply cannot consider every relevant fact whenever we are making a moral decision. Thus, we require general moral principles to which we can easily and quickly refer. The critical level of moral thinking is used because our general principles often come into conflict, and we must resolve our conflict of duties. Because Hare is a desiresatisfaction utilitarian, he believes that within all of this thinking, the desires of other people should be given a great deal of weight. But does this theory rest upon a false assumption that desires are always comparable? Through analysis of an excerpt from a speech delivered by Malcolm X, I present the concept of internalized oppression, and examine whether or not the desires of a highly internalized person pose a problem for Hare's theory. From this analysis I conclude that Hare's assumption that all desires can be compared is, in fact, wrong, and that desires formed by different people are not just different, but are formed differently. Hare's theory, as presented, cannot account for this fact, but could it be amended to respond to it? To conclude the thesis, I suggest dialogue as a possible way to begin transcending this problem for Hare's theory, and argue that if it is possible, Hare's theory should be amended, rather than rejected.

Amy L. Keith

Advisor: David R. Cummiskey

Women in a Well-Ordered Society: A Feminist Critique of John Rawls's Use of the Family in *A Theory of Justice*

My goal is to take the primary principles of Rawls' theory, with which I agree, and apply them to the interconnected ideas of the 'equal worth of liberty' and the institution of the monogamous family. I believe that Rawls fails to adequately and completely apply the principles of his theory to these two essential aspects to his theory, and therefore produces an outline for an inherently unjust system. I first look at the injustices for women that are produced by endorsing the unequal worth of liberty and the institution of monogamous family. I then plan to look at his reliance on the monogamous family for moral development and the stability of society, as well as his reliance on the distinction between equal liberty and equal worth of liberty, and show how they both conflict with his theory as a whole by resulting in or enabling the subordination of women. I hope to show how the ideas of unequal worth of liberty and the institution of the monogamous family are irrational and unjust ideas according to Rawls' own standards. Using feminist theories, in conjunction with Rawls' own principles, I hope to show why he cannot and does not need to rely on the monogamous family for moral development or societal stability. Lastly, I would like to develop a hypothetical construction of what society would look like if a truly egalitarian view of Rawls' theory were fully applied - one in which the family is truly just (or nonexistent) and there is no (or a far lesser) distinction between equal liberty and the equal worth of liberty. I hypothesize that such a theory would entail such things as complete public healthcare, paid domestic labor, and vast government subsidized social benefits and institutions.

PHYSICS

Andrew E. Brownlee

Advisor: Eric R. Wollman

Gravitational Lensing by a Point Mass

There is good evidence that visible matter is only a small fraction of the total mass in the universe. The unseen mass is called dark matter. The presence of dark matter is inferred from its gravitational influences. One way currently being used to detect dark matter is with gravitational lensing. Gravitational lensing is the deflection of light by the gravitational field of a massive but perhaps invisible object. This lensing can make a background light source appear brighter than it is in the absence of lensing. If we monitor the brightness of a star, we can detect the change when an otherwise undetectable mass passes near the line of sight. We will look at the basics of gravitational lensing by a physically compact ("point") mass and then discuss recent detections of lensing and the interpretations of these detections.

John T. Cullinan*

Advisor: Emory F. Bunn

Lie Theory and Quantum Mechanics

To understand spin-angular momentum in quantum mechanics, we use a Lie-theoretic approach. The theory of one-parameter groups is developed to introduce the exponential map—the natural map from a Lie algebra to its associated Lie group. The Lie group of primary interest in this thesis is the Lorentz group of spacetime symmetries, since it contains a subgroup that is used to study spin-angular momentum. However, we study the special linear group since it is the universal cover of the Lorentz group and thus has a more manageable topology. We then categorize irreducible representations of both the special linear group and its Lie algebra and apply this to the theory of the spin-angular momentum of elementary particles.

David A. Ennis

Advisor: George A. Ruff

Single Bubble Sonoluminescence

Sonoluminescence is a phenomenon in which bubbles, placed in an acoustic field of distilled water, collapse and emit periodic pulses of light in synchrony with the frequency of the acoustic field. Thus, sonoluminescence represents the transformation of sound energy into light, a concentration of mechanical energy of up to twelve orders of magnitude. An apparatus to produce single-bubble sonoluminescence has been built to study the characteristics and sensitivity of experimental parameters of sonoluminescence. Possible explanations of single-bubble sonoluminescence are considered, along with applications.

Edward J. Felton

Advisor: John E. Smedley

Electronic Energy Transfer in Ba (5d7p) 3D_1 Rare Gas Collisions

Electronic energy transfer in collisions of Ba (5d7p) 3D_1 with rare gases (He, Ne, Ar) is studied through time- and wavelength-resolved fluorescence techniques. Barium atoms with rare gas in a high temperature vacuum cell are excited to the 5d7p 3D_1 state from the ground state with a frequencydoubled dye laser at 273.5 nm. Lifetimes for near-resonant energy states are examined through exponential decay from the laser excited state. Emitted light with wavelengths in the range of 300nm to 500 nm is studied with wavelength-resolved fluorescence and is recorded with a boxcar averager and computer. The distribution of near-resonant states populated by collisions as well as rate constants for collisional transfer are determined from emission line intensities.

Paige L. Heller*

Advisor: Gene A. Clough

A Geophysical Gravity Survey in Search of Aquifer Potential, Eldorado, New Mexico

The town of Eldorado, New Mexico, about 10 miles southeast of Santa Fe, is growth-restricted due to an insufficient water supply. Exploration drilling reveals a complex subsurface geology. These limited data cannot accurately represent the subsurface groundwater potential of the area. This study uses a detailed gravity survey to model the thickness, distribution and structural characteristics of rock units that may contribute to groundwater transport. Comparison of the data with other geophysical work in the area helps to constrain a three-dimensional model of the subsurface geology. Eldorado sits in a small structural basin, the Santa Fe Embayment, which is an intra-rift feature of the Rio Grande Rift. It is filled with thick layers of the Tertiary-Quaternary sediments that are the primary water source for the greater Santa Fe area. At its present size of nearly one thousand families, Eldorado experiences water shortages during dry periods. A data set of over 2,000 gravity stations across a 30x30minute quad was compiled to develop two- and three-dimensional models of the residual gravity anomalies that represent the subsurface geology, rock units and associated structures. Correlation with models derived from seismic and magnetic data reveals a deep, enclosed basin containing up to 10,000 feet of Tertiary sediments. While the data do not at this time delineate untapped groundwater aquifers, they provide information that will affect future drilling and water exploration in the Eldorado area.

Amy C. Sullivan

Advisor: George A. Ruff

Simultaneous Trapping of Cs and Rb in a Vapor-Cell MOT

We have developed a magneto-optical trapping apparatus which permits simultaneous cooling and trapping of cesium and rubidium atoms. The background vapor pressures of each atomic species are independently controllable, as are the intensities and frequencies of the respective trapping and repump lasers. Trap sizes and positions are determined by a pair of CCD cameras which view the trap from orthogonal directions, and loading times for each species are determined by PMT observations of trap fluorescence. Loading times of the individual traps are observed in order to calculate trap loss rates of one atomic species due to cold collisions with the other atomic species.

Erik S. Thomson

Advisor: Gene A. Clough

Ice Mechanics: Stress, Strain and Compressive Failure

Concepts of solid state mechanics, such as shear stress and basal plane faulting, are applied to ice, considered as a solid material. Fresh water ice is placed under uniaxial compression and results compared with previously published literature. The behavior of this ice under compression is considered in both the ductile and brittle regimes. Further, experiments qualitatively measure the strength and the compressive failure characteristics of ice. Macroscopic applications of ice research done in the lab are also addressed.

David W. Weir

Advisor: John E. Smedley

An Analysis of Solar-Driven Natural Convection Energy Conversion Systems

Solar radiation creates natural convection currents, i.e. a rising flow of warm air, within a confining structure. Using a specifically designed structure, these induced convection currents can be put to use driving a generator. This presents an alternative to using fossil fuels and other nonrenewable, polluting resources to generate electricity. This thesis includes an experimental analysis of the problem, involving scale modeling and simulation. A theoretical analysis of the physics driving the system is also performed, from both thermodynamic and fluid mechanic perspectives. In other words, the system is looked at in terms of how the heat flows through it and also by considering the moving air to be governed by fluid properties. The results are analyzed with respect to both physical and practical aspects of the system.

Adnan Yousuf*

Advisor: Hong Lin

Pattern Dynamics in a Unidirectional Photorefractive Ring Resonator

A unidirectional resonator driven by photorefractive crystals show chaotic and unsteady field dynamics. This is a numerical study of the behavior of such a resonator. It has been shown that under the paraxial wave approximation, a set of coupled partial differential equations can be derived from the complete Maxwell's equations for the optical field. A truncated series of Gauss-Laguerre basis functions are used to approximate solutions to these PDEs. Different numerical analysis techniques are explored in MATLAB to determine efficient ways of solving this problem.

POLITICAL SCIENCE

C. Michele Anandappa

Advisor: Douglas I. Hodgkin

The Electoral Impact of Economic Conditions and Presidential Performance: An Individual Level Analysis of the Role of Personal Grievances in Congressional Voting

Using data gathered from the 1986, 1988, 1990, and 1992 American National Election Studies, this thesis examines the effect of perceptions concerning personal and national economic conditions and presidential popularity on voting in House elections. The primary intent is to discern whether voters cast their ballot according to personal economic grievances and discontent over presidential job performance or whether they use alternative criteria to guide their electoral decision. The initial assessment of this study is that an asymmetrical effect of voter responses to both economic and presidential job performances exists. Candidates belonging to the party of the President would be adversely affected by voters who viewed their personal financial situation as deteriorating and by those who had low perceptions of the incumbent presidential performance, but would not necessarily benefit from prosperous conditions or high presidential approval ratings.

Deirdre M. Dastous

Advisor: Eduardo A. Honold

The Region as Political Actor in the European Union: A Case Study of Catalonia and the Basque Country

Many scholars claim that the birth of supranational bodies, such as the European Community, will inevitably lead to the demise of the sovereignty of the nation-state and a decline in the representation level of the people of Europe. In fact, there is currently a body of literature which suggests the growth of a "democratic deficit" due to the supposed transferral of power from the state to the international community. However, other evidence leads to the hypothesis that the European Community may actually allow certain groups a greater say in the decision-making processes of government. This thesis focuses on certain "regions" as political groups that may benefit from a multilevel form of governance. The analysis takes the form of an extended case study, examining the historical relationship between the Spanish national government and the Spanish regions of Catalonia and the Basque Country, as well as determining how the dynamics between them have changed as a result of Spain's admission into the European Union. The preliminary findings suggest that the EU's structure does have the potential to allow for greater regional representation, although the extent to which this has been achieved is questionable.

Kari M. Jorgensen

Advisor: Arlene E. MacLeod

Religion, Politics and Social Change in Syria, 1839-1914

Interaction between the changing central Ottoman authority and local governments in the Arab provinces between 1839-1914 shaped the political and religious sentiments of the factionalized Syrian elite. Ideological and social actions initiated by religious reform movements, and adopted by Syrian notables for political reasons, embodied and shaped the first ideas of Arab nationalism. Political motives of the Syrian religious elite also shaped the role that they played in Islamic reform movements within the Empire. Islam was, for many reformers, a means for change— legitimized by the impact of the changing socio-economic political processes and structure of the Ottoman Empire on the traditional institutions of the Arab elites. Changing urban configurations and the political aspirations of the Syrian religious elite in the late Ottoman empire resulted in calculated political participation in Islamic reform movements by certain factions of the religious community. I will examine religious reform within the historical context of the Ottoman Arab province of Syria and draw some conclusions about the ways in which Islamic reformers in the contemporary Middle East continue to utilize the politics of religion and social change.

PSYCHOLOGY

Ana R. Davis*

Advisor: Georgia N. Nigro

Daughters Speak: A Qualitative Study of Women's Emotional Experience in the Father-Daughter Relationship

My study examines women's emotional experience in the father-daughter relationship. Past research demonstrates that parents are important in the socialization and modeling of their children's emotions. They also show that most fathers are not emotionally expressive. Yet, fathers, more than mothers, encourage sex-typed behavior, e.g., they often "teach" their daughters to be emotional. In order to make sense of the paradoxical scholarship on fathers, daughters, and emotions, twelve white, collegeaged women participated in semi-structured interviews. Interviews allowed me to understand the "emotional" meanings of these relationships in a contextual manner. Questions focused on the women's thoughts about their own emotionality, their subjective experience of their father's emotions and his influence on their own, and how the emotional relationship between father and daughter has changed over time. Grounded theory methodology was used to guide data collection and analysis. By proceeding "from the ground up," the women's words created theory. Results show that fathers are fairly unemotional with their daughters, many times using humor as a safe way of communicating thoughts and feelings. Interestingly, daughters see a change in their relationship with their father in college. Fathers are viewed as more emotional in this stage of life. Results also suggest that the fatherdaughter relation "teaches" these women to repress certain emotions, such as anger, frustration, and annoyance. In this way, fathers seem to instill in daughters the need to put on a "happy face" and create a "false self" in order to maintain connection and affiliation with others. Further results, implications, and conclusions will be discussed.

Abigail M. Francis

Advisor: Kathryn G. Low

Medication Compliance and the Health Status of Pediatric HIV/AIDS Patients

Levels of medication noncompliance in pediatrics have been estimated to be anywhere from 11 - 93%. It has been shown that noncompliance compromises the efficacy of the medication and decreases the chances of achieving the treatment goal. The following study has been designed to predict compliance and to investigate the effects of compliance on the health status of HIV patients from a pediatric clinic. Variables designed to measure patient health status are CD4 count, viral load, and CDC (Center for Disease Control) stage. Variables designed as measures of compliance include pharmacy refill history, and the self-reported maintenance level from the parent, child, and provider. Variables designed to predict compliance include the parent's maintenance level, common barriers to maintenance, believed consequences of maintenance and nonmaintenance, health beliefs of the parent and child, importance of the patient/parent/provider relationship, feelings about trust and responsibility, the type of drug formulation, and the complexity of the drug regimen. Some commonly reported reasons for noncompliance by pediatric patients and their parents include forgetting; discontinuing medications when symptoms have cleared; side effects; duration of therapy; complexity of the drug regimen; method of drug administration; drug formulation; and the appearance, color, taste, and size of the pill or capsule.

The goal of the study is to learn what factors influence patient compliance and to determine if patient health is affected by medication compliance. It is predicted that patients displaying characteristics of poor compliance will show a decline in health status and that patients displaying characteristics of good compliance will show an increase in health status.

Jennifer D. Rifkin

Advisor: Kathryn G. Low

Trauma, Pain Tolerance and Dissociation

Dissociation can best be described as “a process that produces a discernible alteration in a person’s thoughts, feelings, or actions, so that for a period of time certain information is not associated or integrated with other information as it normally or logically would be” (Putnam, 1993). Dissociation occurs quite regularly throughout the general population, and people range from having a low to high tendency to dissociate. Much research has shown that people with a history of sexual abuse or sexual assault are often more dissociative than the general population. This thesis is concerned with that association. What is the relationship between sexual abuse and assault histories and dissociation? Does an abuse history cause dissociative tendencies? Do all types of traumas elevate dissociation levels, or those that are interpersonal? To answer these questions, Bates students were recruited to participate in an experiment. First participants were requested to engage in a cold pressor task, to determine baseline pain tolerance. They were then asked to read either a short description of either a rape (interpersonal trauma), a plane crash (non-interpersonal trauma), or New Year’s traditions (non-traumatic control). After reading the description, participants were asked to stare at a dot, a task which has been shown to induce dissociation. Next, the cold pressor task was completed again, and the change in pain tolerance served as the measure of dissociation. Finally, participants were requested to complete two questionnaires. The first was an abuse history form, and the second was the Dissociative Experiences Scale-II, which measures dissociative tendencies. Preliminary data analysis suggests that there is an interaction between reading the rape situation and having an abuse or assault history, such that pain tolerance decreases during the second cold pressor task. This brings to surface many other questions, which may, in part be answered by further data analysis.

David M. Silverman

Advisor: Georgia N. Nigro

A Case Study of an Alternative Classroom within a Traditional School

There has recently been a resurgence in the number of alternative education programs in the United States. While alternative education programs had their origins in the 1960s and 1970s, the majority of existing alternative education programs were created in the last fifteen years. These programs often focus on building community and employ cooperative learning and hands-on teaching techniques. The present research seeks to describe and understand the experience of twenty students attending a non-graded, multi-age classroom within the walls of a traditional elementary school. Specifically, the study examines the role of the alternative classroom structure in fostering psychological factors such as self-efficacy, self-esteem, and intrinsic/extrinsic motivation. In order to address the aforementioned variables, a case study employing multiple methods of inquiry was used. This approach utilizes observations, questionnaires and semi-structured interviews in order to create the clearest description

of the classroom possible. In some cases, I compared the alternative classroom to more traditional classes within the same school. The results from the multiple methods of inquiry will be analyzed to see if students in the alternative classroom exhibit the kind of engagement and motivation that the alternative environment was meant to foster.

Lyndsey A. Tangel

Advisor: Robert S. Moyer

The Effects of Repeated Straightforward Questioning on Eyewitness Memory for an Arousing Event

Previous research has focused on how a witness of a crime or similarly provocative event can easily be misled about the details of the incident when asked misleading questions. These questions, then, create false details in the witness's memory for the event. Additionally, as the witnesses are repeatedly asked the same question, it has been shown that their tendency to believe the question is true increases (exhibiting the "truth effect"). This thesis, however, has departed from the popular approach of examining how misleading questions distort memory. Instead, straightforward questioning was used, such as, "Did the thief wear gloves?" Participants in the study watched an arousing movie clip, and then answered straightforward questions. Some questions were asked only once, and others three times. After a two-week retention interval, subjects were asked to answer each question they were previously exposed to, as well as a group of new questions. It is hypothesized that even though participants are not misled, the repetition of both "true" and "false" questions will lead the subject to report, on final testing, the questions "truer" than previously rated. This would decrease recall accuracy for "false" details, but enhance recall for "true" details of the incident. It is also expected that, regardless of its truth value, the more times a question is presented, the greater the shift towards "true" will be. The results of this study will have implications for how witnesses should be questioned after a crime or similar event has taken place.

RELIGION

Joel Y. Mahoney

Advisor: Carl B. Straub

From Object to Subject: Kandinsky's Leap of Faith

Wassily Kandinsky stands out as one of the great figures in the history of art. By letting go of the objective re-presentation which had prevailed for thousands of years, he began to produce a shockingly new art that was focused on a more subjective form of self-expression and the artistic means which make this possible. What is interesting is that Kandinsky developed an ideology that mirrored these artistic pursuits in its general shift from *objectivity* to *subjectivity*. This essay compares Kandinsky's ideology to the existential thought of his own day, but shows how this ideology transcended Existentialism with its principle of the "Inner Necessity," which led Kandinsky to his famous art and to the certainty of "*objective*" spiritual truths. In this way the essay explores the need for a religious leap of faith to bring certainty back to life, and examines Wassily Kandinsky's version as one interesting possibility.

THEATER & RHETORIC

Tamara R. Bucknell-Pogue

Advisor: Margaret A. Imber

A Peace of Paper: Rhetoric, Polysemy, and Hermeneutics in the Oslo Peace Accords

The Oslo Interim Peace Accords (Oslo II), the second document in the peace process between the Israelis and the Palestinians, has been widely criticized. Despite the media's original claims that Oslo was a "miracle," the existence of which would redefine the Middle East, more than three years after the intended implementation of Oslo II, the majority of the policies established in the document have yet to be implemented. I contend that the polysemous language (language that has multiple meanings and interpretations), which the framers chose in the hopes that it would increase the likelihood of reconciliation, has contributed to the implementation problems. Then, using a hermeneutic approach to rhetorical analysis, I examine how some of the differences in meaning inherent in the text have played out upon implementation. I conclude that polysemous language in Oslo II, despite its ability in some cases to promote reconciliation, has hindered the overall implementation of the document, and in some places created controversies greater than those it was intended to resolve.

Lauren M. Todd

Advisor: Martin E. Andrucki

Euripides *Electra*: A Director's Analysis

I spent part of my junior year in Athens, Greece studying classical theater, and it was after I visited Mycenae in the Peloponnese that I decided to direct *Electra* by Euripides. My thesis includes an in-depth analysis of the Euripidean text, by comparison to his other plays and to the plays of his predecessors, which were relevant to the myth. Once my first semester research was finished, I was able to more fully understand the context in which the play was written and its original meaning, thus guiding my directorial vision for the production. Reflecting the spirit of classical Greek drama, the production remains presentational and theatrical. However, in the spirit of the modern stage, it is a spectacle seen through the eyes of a very angry young woman. It is this anger that the production examines. Shattered in childhood by the shock of an experience too horrible for a girl to bear, *Electra* remains haunted by love for her dead father, and obsessed with seeking revenge. The play tells the relationships of a family and their endless and inescapable cycle of violence. It is an exploration of the darkest and most vulnerable sides of human nature. And most of all, it is a story for now which shows us the effects of anger on the human body, psyche and spirit.

WOMEN'S STUDIES

Hanna C. Bengtsson

Advisor: Victoria L. Johnson

The Criminalization of Sex Work: A Feminist Analysis of the Disempowerment of Sex Workers in Sweden

On January 1st, 1999, Sweden's parliament, the *Riksdag*, implemented a law under the "*Kvinnoväldskommissionen*" (Commission on the Violence of Women) that criminalized the buying of all sexual services. My thesis aims to study the short term effects of this legal change, entitled "*Kvinnofrid*," (Protection of Women) in light of the "voices" of female prostitutes, along with the stances of governing bodies such as the *Riksdag* and the Nordic Council, the European Union and the United Nations. I will speculate as to why this change in legal status occurred, and analyze the implications of this change in light of notions of gender equality.

Ana R. Davis*

Advisor: Georgia N. Nigro

Daughters Speak: A Qualitative Study of Women's Emotional Experience in the Father-Daughter Relationship

My study examines women's emotional experience in the father-daughter relationship. Past research demonstrates that parents are important in the socialization and modeling of their children's emotions. They also show that most fathers are not emotionally expressive. Yet, fathers, more than mothers, encourage sex-typed behavior, e.g., they often "teach" their daughters to be emotional. In order to make sense of the paradoxical scholarship on fathers, daughters, and emotions, twelve white, collegeaged women participated in semi-structured interviews. Interviews allowed me to understand the "emotional" meanings of these relationships in a contextual manner. Questions focused on the women's thoughts about their own emotionality, their subjective experience of their father's emotions and his influence on their own, and how the emotional relationship between father and daughter has changed over time. Grounded theory methodology was used to guide data collection and analysis. By proceeding "from the ground up," the women's words created theory. Results show that fathers are fairly unemotional with their daughters, many times using humor as a safe way of communicating thoughts and feelings. Interestingly, daughters see a change in their relationship with their father in college. Fathers are viewed as more emotional in this stage of life. Results also suggest that the fatherdaughter relation "teaches" these women to repress certain emotions, such as anger, frustration, and annoyance. In this way, fathers seem to instill in daughters the need to put on a "happy face" and create a "false self" in order to maintain connection and affiliation with others. Further results, implications, and conclusions will be discussed.

Laura C. Sundstrom

Advisor: Erica Rand

Unlabeled: Representations of Gender Variance in the Photography of Catherine Opie, Loren Cameron, and Del LaGrace Volcano

Gender is often identified within the framework of language, yet the words with which we name gender, the supposedly ubiquitous pronouns, “she” and “he,” are inadequate. Gender identities that vary from the feminine female and masculine male standards are difficult to describe within this binary scheme. Visual representation of gender is an alternate way to express identity, not necessarily confined to the restrictions of language. Although the use of language is inevitable in the interpretation of images, used together, language can take on new meaning, and at times even enhance the power of the image. This thesis examines representations of gender variance in photography, with a focus on the experiences and production of photographic images of and by people who have been given a “female” label early in life but have come to realize that this does not accurately express their identities. The difficulty of writing a historical background of transgendered and transsexual people is considered through an analysis of the work of transgender activist and scholar, Leslie Feinberg. The primary focus of the thesis is the photography of Catherine Opie, Del LaGrace Volcano, and Loren Cameron. I examine: the role of photography in the deconstruction of restrictive binaries of language; the importance of narrating, photographically and verbally, one’s experiences and consciousness of the process of attaining a (more) comfortable gender expression; and the effects of visual representations of the intersection of sexuality, race, and ethnicity with gender. The work of these photographers is particularly useful to the subversion of oppressive gender categories because of its appreciation and accessibility both inside and outside of academia.

Jessica L. Taisey

Advisor: Georgia N. Nigro

Advisor: Anne Wescott Dodd

Gender Issues in Primary Education: A Case Study Among Students From a Low-Income Elementary School in Maine

Previous research has shown that gender affects the success or lack of success of students in school. Most studies have examined factors that affect girls, usually in negative ways. Recent research, however, reveals that schools may also be inequitable for boys. This case study investigates the meaning and degree to which gender differences exist in the treatment, aspirations, and performances of forty fifth and sixth graders from an urban elementary school. The data collected include classroom observations, Maine Educational Assessment scores, self-reports on student aspirations, and observations of students’ participation in a idealized classroom setting organized with the intent of minimizing the effects of gender. Results from this study reveal that boys in this context are thriving: they participate more in class and achieve higher MEA scores than girls. The girls feel supported by their teachers but think no matter what they do they will not succeed. In the idealized setting girls reported they preferred the mixed-sex to single-sex activities, even though boys in this grouping were more vocal. At the same time mixed-sex groupings were more beneficial for boys than single-sex groups because they were less competitive with each other and more focused. Although the results of this study may not be the same as those for students in other settings, the picture of gender in the context I present suggests some ways teachers might change practices to promote more gender equity and raises questions for further research on this topic.